

IUPAC – UNESCO – UNIDO Safety Training Program October 6 to 17, 2003

Coordination of the IUPAC – UNESCO – UNIDO Safety Training Program:

Secretary of the IUPAC Committee on Chemistry and Industry,
Dr. Mark C. Cesa

Host Company:

BP Chemicals, Inc.

Trainees:

Jane B. Nyakang'o - Nairobi, Kenya
*Environmental Specialist - Environmental Engineer
Kenya National Cleaner Production Centre, Director*

Ana Luisa Arocena - Montevideo, Uruguay
*Environmental Specialist - Pharmaceutical Chemist
CEMPRE Uruguay, Executive Secretary - (Business Commitment for Recycling, non-profit
association of seven big companies to promote waste recycling, www.cempre.org.uy)
ma&a S.A., Technical Director - (Young small company on treatment, conditioning and storage of
hazardous and non-hazardous industrial wastes, www.mayauruguay.com)*

Places Visited:

- | | |
|---|----------------|
| 1.- BP Chemicals, Inc. - Naperville Complex
Naperville, Illinois, USA | 6/10 to 9/10 |
| 2.- Superior Special Services, Inc. - Onyx
Port Washington, Wisconsin, USA | 10/10 |
| 3.- Onyx Environmental Services, LLC
Menomonee Falls, Wisconsin, USA | 10/10 |
| 4.- BP Chemicals, Inc. - Lima Complex
Lima, Ohio, USA | 13/10 to 17/10 |
| 5.- Shawnee Township - Fire Department
Lima, Ohio, USA | 15/10 |
| 6.- The Premcor Refining Group, Inc. - Lima Refinery
Lima, Ohio, USA | 16/10 |
| 7.- Akzo Nobel Functional Chemicals, LLC
Lima, Ohio, USA | 16/10 |
| 8.- Envirosafe Services of Ohio, Inc.
Oregon, Ohio, USA | 16/10 |

Topics Covered

1.- BP Chemicals, Inc. - Naperville Complex

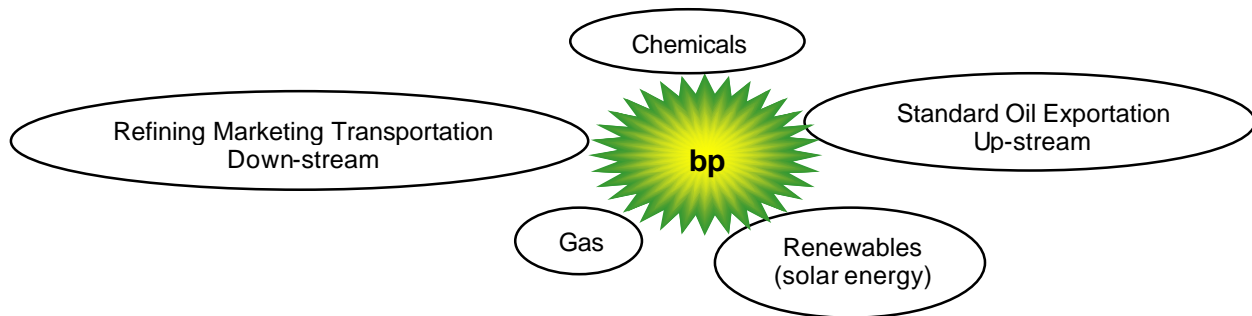
A.-

Mark Cesa *Senior Research Associate, Nitriles Process Chemistry*
Geoffrey Gilman *Health, Safety and Environment, Nitriles Business Unit*

Program orientation: goals, schedule, hosts, how to move in the facility.

B.-

George Tacquard *Business Unit Leader, Nitriles*
Mel Luetkens *Business Technology Manager, Nitriles*
Jay Kouba *BP Technology*



Group of chemicals produced by BP Chemicals, Inc:

acrylonitrile, acetonitrile, ammonium, urea, nitric acid, barex, spandex, butanediol, catalysts

Acrylonitrile: history, market, risky conditions to do the business ⇒ HSE

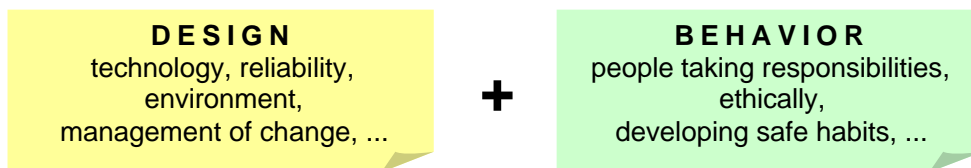
HSE programs:

- Getting HSE Right: everyone is responsible
- 13 elements of BP's HSE, leadership dimensions
- 92 sub-items: expectations
- Responsible Care
- Permits to Work
- PAWS: peer assisted workplace safety
- Social awards
- Safety teams - Safety Days

With punitive policies, no power to get zero level: no accident, no harm to people, no damage to environment (Orca case)

Underestimation of risks - We can't predict accidents (Thickness of a 50 folded 'thin' paper)

Developing researches in chemical processes, 2 compounds:



Costs of unsafe procedures.

Better employees are got if they work in safer manner, so they take care about other things.

Knowing about you buy - More expensive is not always better.

MSDS: edition. Capacitating of distribution and commercial chains.

C.-

<i>Tom Senn</i>	<i>Safety Coordinator</i>
<i>Grace Chiang</i>	<i>Industrial Hygiene Coordinator</i>
<i>James Saylor</i>	<i>Environmental Coordinator</i>

Site safety orientation

Site health programs:

- Engineering control
- Respiratory program
- Medical evaluation
- Training program
- Hear conservation program

Tools and procedures to monitor chemicals

Introduction to OSHA, ACGIH, CFR29 regulations

Site environmental policy: CIP (Comply with the law, Improve, Prevent Pollution)

Critical points of the Naperville Complex according to ISO14000 and environmental management

- Solid waste management system: documentation, labels, containers, collection system, storage, services contracted.

- Waste water treatment system

- Atmospheric emissions system

D.-

Medical Department

<i>Cynthia J. Manfredi</i>	<i>Medical Director</i>
<i>Jane L. Cooper</i>	<i>Nurse</i>

Facilities, equipment's and team of the Medical Department

Hearing conservation program

Acrylonitrile exams

Travel consultations

Wellness exams

Training on cancer prevention and healthy lifestyle

Influenza vaccine program

Emergency case management

Respiratory protection

Introduction to USA regulations

E.-

<i>James D. Jernigan</i>	<i>Director, Product Stewardship & Toxicology</i>
<i>Deborah L. Williamson</i>	<i>Manager, Product Registration - PST</i>
<i>Mary E. Mattler</i>	<i>Advisor, Product Regulatory Compliance - PST</i>
<i>David R. Dutton</i>	<i>Senior Toxicologist - PST</i>

Goals of the PST Department:

- Provide regulatory and technical support to every stage of the product lifecycle: complying concerns from the official agencies worldwide, applying cradle-to-grave focus for BP products.
- Increase stakeholder confidence in chemicals

Functions:

- Product safety: MSDS, labels, customer outreach, production and distribution, webs
- Product registration: chemical inventories, registration process, governmental authorizations
- Toxicology: understand and manage product HSE risks + influence the public policy agenda on product HSE matters.

MSDS's sources (websites)

F.-

Jay R. Couch
Bruce Rosen
Joseph P. Bartek
Stephen C. Jevne

Director, Nitriles Engineering
Research Associate, Process Chemistry and Engineering
Research Scientist I, Nitriles Catalysis Research
Research Scientist, Nitriles Catalysis Research

Implementing good engineering practices

Site Safety Council - Structure, participants, meetings, planning and implementing programs, teams (traction, HIPO communication, working alone, wellness, HSSE day, safety action team, strategy, petrochemical stream standard, global interactions), roles, path forward.

Safety Review Committee - A group of experts actually look up the construction for new processes, new equipment, changes.

Phase 1 - What is the process? What is needed to be considered?

Phase 2 - Look for hazard and operability

Phase 3 - How it is going to be operated, to interact?

Result: recommendations + considerations

Mention to Process Safety Management from OSHA, and Hazard and Operability Studies from different sources.

G.-

Jason B. Strayer

Process Engineer, Nitriles Business Unit

Catalysts pilot plant: process, effluent treatment, gas emissions burner, and waste handling.

H.-

Mike A. Markowicz
Alice Boomhower
Greg Crum

Health & Safety Specialist, Nitriles BU
Environmental Specialist, Nitriles BU
Coordinator, Technical and Safety Services,
North American Commercial Operations
Research Associate, Nitriles Chemistry Research

Eric J. Moore

BP's Golden Rules of Safety

Safety Audits, safety dialogues. Advanced Safety Audit Report

Root Cause Analysis - A guide to incidents investigation. Comprehensive list of causes. Possible immediate causes, system causes.

Recording incidences

Recording capacitating needs.

Approach of the USA environmental laws. Air permits.

Laboratory procedures related with safety issues.

I.-

Rich A. Symuleski

Manager, Crisis Management, Chemicals and Downstream

Crisis management

Facilities, Equipment and Capabilities. Automated Notification System.

Over-respond efforts.

2.- Superior Special Services, Inc. - Onyx

Kevin D. Shaver

General Manager

The largest facility in USA to process mercury wastes: bulbs + switches' cars + everything with Hg
Sources: companies + customers understanding energy save-environment management +
damage packaging + institutional or educational sites.

Process description and visit, outputs, prices.

USA mercury-lamp recycling rate.

3.- Onyx Environmental Services, LLC

Joseph P. Badman

Facility Manager

Treatment and storage facility with permits to non-hazardous, transportation, hazardous storage
and hazardous stabilization.

Inorganic stabilization: Pb, As, and others metals, with sulfurs, calcium oxide, water and
cement

Solidification of liquids.

Storage: nowadays working a full, in 2015 is expected to be empty due to waste
minimization. Hazardous + non-hazardous + open site.

Re-conditioning to send to another operations: de-packing units, corrosives.

Alternative combustibles to cement kilns.

Laboratory

Documents

4.- BP Chemicals, Inc. - Lima Complex

A.-

Kevin W. Sprague

HSE Manager, Lima Complex

Geoffrey Gilman

Health, Safety and Environment, Nitriles BU

Charles F. Treolar

Plant Manager, Lima Complex

Jayne Kisor

Welcome, schedule, hosts, how to move in.

Safety video orientation and quiz.

Main guidelines on HSE: strong leadership; involvement employees / safety commitment; PAWS /
recommendations and opportunities; the right environment: cultural change; manager visibility.

HSSE: health, safety, environment and security. 3/21/2001 Lima Safety Stand .

Getting HSSE Right.

Organization of the charts.

Association with PCS for Nitrogen management.

Contract with Jacobs Constructors for safety and health.

Driving tour of Lima Chemical Plant.

B.-

Nick Steimle

Environmental Co-op

Todd Flippin

Safety Co-op

The Co-op system (student trainees).

National Pollution Discharge Elimination System, chemical additives for water treatment

Noise surveys, general policies of the plant, internal permits.

C.-

Shaun Spainhower
David A. Breitigam
Dave Linderud
Bob Schantz

Safety, Jacobs Constructors, Inc.
Senior Industrial Hygienist, Lima Complex
Lima Process Safety Committee Leader
Quality Control, BDO Plant

PPEs: suites, gloves, glasses, respirators. Brands and websites suppliers, preferred types.
Gas monitoring. Brands and websites suppliers, preferred types
Training and pocket guides. OSHA, NIOSH/CDC.
Respiratory protection, emergency breathing operations, annually tests.
Noise, ear plugged, ear plugged+masks, hear conservation program
Chemical hazards. Lead. Asbestos.
Ergonomics.
Traction = tracking + action, for more significant bad actions.
Advanced Safety Audit, for less significant bad actions.
Lima Process Safety Committee meeting (we attended one)
 Review plant incidents.
 Safe Plan of Action sheet: a safety procedure when Sop's don't exist yet
 Hazop report items
Safety sample collection issues
Safety laboratory practices
Permits like 'confined space entry permit', 'master clearance permit'.
Key's system to open and shut valves.

D.-

Jim Cook
Jan Kentner

PAWS Facilitator
Safety Services

Behavior science technology.
PAWS, peer assisted workplace safety. Name chosen by the employees. Participation voluntary.
The relationships with the Union.
The differences between rules and behavioral attitudes. On the basis: rules are clear and known,
so it is possible to work over behavior.
PAWS to an employee who was welding (we observed it)

E.-

Nanette L. Smith
Pamela Wafzig
Brent Pace

Environmental Services. Air leader & PCS - NH3, Urea, HNO3
Environmental Services. Air Butanediol
Environmental Services. Water.
Air Nitriles: Acrylonitrile, Acetonitrile, Barex, Catalysts
Quality Control, PCS Nitrogen Plant
Environmental Services. Waste and Deepwell.

Tom Say
Joe Bianco

Air Permits - Clean Air Act.

Particle matter, Nox, CO, HC/VOCs, Sox, NH3, hazardous air pollutants.
Permit to Install - Permit to Operate - Prevention of Significant Deterioration Permit, air
criteria pollutants. Absorber off gas incinerators.

Water pollutants treatment.

N2 plant: ionic exchange resin bed, storm water to river.
Acrylonitrile plant: VOC's to refinery, aerobic treatment plant, activated sludge together with
storm water; others to deep well.
Barex: process and storm water to refinery.
Sanitary waste water to refinery.
Analysis, frequencies, water quality standards, NPDES for winter and summer.
Discharge monthly reporting on a concentration basis, not on total loading.
Water treatment ponds. Outfall to the river.

Deep well technology.
Solid wastes to incinerator, others solid wastes.
Groundwater monitoring program. Bioassays of surface waters.
Audits of EPA.
RCRA. USEPA Ohio.

F.-
Linda Schumacher *Health Services Coordinator*

Lima occupational health clinic. Facility, equipment, staff.
Acrylonitrile medical surveillance.
Asbestos medical surveillance
Respiratory protection equipment users qualifying examination
Hazardous materials medical surveillance
Occupational noise medical surveillance
Butadiene medical surveillance
Health maintenance
Job assignments and surveillance type
Counseling, education and training
Emergency response
Travel
American Association of Occupational Health Nurses

G.-
Melinda Wright *Human Resources*

People Effectiveness Team (no managers) recommendations:
1.- Communication was filtering down ⇒ e-mails, newsletter, bulletin, keypoints (TV, boards)
2.- Team work ⇒ CSI, Inc. consulting group learning how to improve communications: direct to the point, highlights.

H.-
Joseph H. Martz *Quality/Safety Systems Manager*

Visit to the Shawnee Township Fire Department.
Coordination among the Lima companies and the Firefighters in case of accident.

I.-
Robert D. Maloney *HSE Technical Specialist*

Coordination of all requirements to Lima Chemicals certifications
Continuous improvement process from implemented ISRS to the gHSEr, passing through:
Responsible Care, Total Quality Management, OSHA Process Safety Management, ISO 9002,
Voluntary Protection Program Star Site, EPA Risk Management Plan, ISO 14001
Process Safety Management review. PSM elements that are ways to reduce process risks.
Management systems integration.
HSE program comparisons.

J.-
James B. Martz *Coordinator. Technical & Safety Services*
North American Commercial Operations

Transportation of hazardous materials.
CFR 49. Introduction to the related to transportation regulation agencies.
Risk management: risk module for risk assessment on transportation
Relationships with third parties extra BP, 'outside the fences'.

5.- Shawnee Township - Fire Department

Tim Mosher

Fire Chief

Firefighters facility, equipment, materials.

Specialized truck on chemical accidents.

Support between Firefighters and Petrochemicals Lima Companies: Allen County Hazardous Materials Emergency Planning Committee, Risk Management Planning.

6.- The Premcor Refining Group, Inc. - Lima Refinery

Paul G. Logsdon

Environmental, Health and Safety Manager

Refinery process flow diagram

Waste water treatment plants. NPDES - Q 7/10 (US Geological Services).

Waste handling.

Air emissions: valves control systems, floating seals, leak detection and repair (monitoring program for pumps and compressors).

Emergency response teams.

EPA facility permits.

7.- Akzo Nobel Functional Chemicals, LLC

Jeffrey F. Wilson

Environmental Specialist

Safety issues.

Process, quality control and warehouses facilities.

Effluent and gas emissions treatment, waste handling.

8.- Envirosafe Services of Ohio, Inc.

Lisa A. Humphrey

Manager, Client Services

Industrial landfill and stabilization services.

Facility information: operating permits, regulations, types and categories of wastes accepted, criteria for landfilling.

Facility design: location, plan, geological and hydrogeological characteristics.

Unit design to prevent infiltration and to monitor it.

Waste treatment processes: stabilization and encapsulation.

Leachate management (external treatment).

Surface water control. Groundwater monitoring.

Air and explosive gas monitoring.

Facility operations:

Waste approval and screening (manifests)

Waste treatments (Super Detox®, macro and microencapsulation)

On-site waste generation and management

Tracking and inventories control, operating records

Safety and security, training programs

Cradle-to-grave:

Corrective action process (past practices)

Closure, post-closure and perpetual care

Long-term liability protection.

Ohio EPA's relationship.

Environmental and economic comparison between electric air furnace dusts recycling and disposal (recycler's exceptions).

Plans for medium and big companies:

- *CEMPRE Uruguay's associated companies*
- *Environmental Commission's members of the Uruguayan Industrial Council*
- *Some companies close related by professional works already done for them*

Seminars based on the concepts of:

- No accidents, no harm to people and no damage to the environment
- No job is more urgent than the necessity to do it safely
- Design + behavior

Presentation of some topics interesting to be commented in Uruguay:

- Getting HSE Right, BP's Golden Rules of Safety, Root Cause Analysis
- Environmental approach of EPA: permits, controls and audits, payments.
- About waste management services visited.
- Deep well technology.

The above mentioned items are already being presented within the second edition of the course "Residuos y Reciclaje" (Wastes and Recycling), prepared by CEMPRE Uruguay and UNIT (Uruguayan Standard Institute, ISO representative, www.unit.org.uy), in which I am the teacher. For 2004, it is expected to offer two more editions.

Plans for ma&a S.A.

Health:

ma&a S.A. is implementing Health programs. Uruguay has no agency like OSHA, nor precise occupational health regulations for chemicals. A cooperation with the Occupational Health Department of the Faculty of Medicine, Universidad de la República, is being established to develop and implement a Health program that should include:

- Mercury medical surveillance
- Respiratory protection equipment users qualifying examination
- Hazardous materials medical surveillance
- Occupational noise medical surveillance
- Health maintenance
- Job assignments and surveillance type
- Counseling, education and training
- Emergency response

Environment:

The Training program confirmed that environmental issues are known enough at ma&a S.A. The company it is expected to be certified ISO 14000 on March 2004.

Financial and economics issues are the main difficulties to implement good technology environmental programs. It is needed better facilities, equipment, laboratory and more hours of specialized human resources.

Nevertheless very good little ideas were taken in waste handling (containers, labels, manifests).

Safety

The biggest lack of ma&a S.A. is the definition of the ma&a's rules of safety (design).

To define them a Safety Process should be established, implementing:

Safety Review Committee for existing procedures, changes and new ones, Safe Plan of Action sheets.

Safety Review for incidents, with route cause analysis.

Risk module for risk assessment on transportation.

Hazop reports.

Improvements from the safety point of view on the ma&a S.A. training program started on September 2003 are needed. The goal should be to know more about safety issues, so it will be

able to establish within the ma&a S.A. group the safety rules. If everybody participate of the safety rules construction process the results are going to be better implemented (behavior).

Plans for the ma&a S.A.'s neighbors

ma&a S.A. is located in a very young industrial park, PTI del Cerro.

- An HSE Team among the PTI del Cerro's companies should be established. For example, it was recently got an agreement among the PTI's companies to have a Medical Emergency Response contractor for all the industrial park.
- A Firefighter Station was located 3 months ago in the PTI del Cerro. Relationships with the Firefighters should be started to implement Emergency Management and Risk Management Plans.
- Seminar of Getting HSE Right for PTI del Cerro's companies will be offered.

General conclusions

The HSE Training Program offered by BP Chemicals, Inc. was a rich and pleasant experience. I feel privileged. I thank very much everybody who made it possible: organizers, sponsors, hosts, trainers and mate. I specially appreciated the arrangements did to visit waste management services. If I've already been an HSE pro-active attitude convinced professional, the Training Program became myself a fanatic.

The good quality of the hosting, including comfortable hotels, agreeable trips, delightful meals, very good ideas for free time, friendly environment and perfect arrangements, left me an excellent impression, and gave me an idea how seriously BP Chemicals, Inc. take the participation in the IUPA-UNESCO-UNIDO Training Program.

To get in contact with all the topics covered and the sites visited was very important for my career, but to get in touch with people was such important as well. That is: to know about trainers' work-style, something about their family and community life-style, their principal potentials and some limitations too.

Trainers put all their efforts and time to enlighten us, with patience and willingness to answer all the questions we had. I think they all did a great job, including people extra BP. A lot of written materials were supplied us, which are very helpful tools to implement the ideas brought from the Safety Training Program.

Suggestions about the IUPA-UNESCO-ONUDI Safety Training Program

I agree with previous Trainees that to be 2 interns at the same time it is beneficial to take the maximum profit of the efforts done.

I recommend to ask for future Trainees at the time of the Training Program is being prepared to indicate the most preferred topics among the HSE issues depending on their works. I believe that is beneficial for both parties.

I suggest to advise future Trainees to bring a notebook with them or to do arrangements to get one. It is very necessary for connection purposes with our countries, to give an order and sistematization to the information received, and to advance in the edition of the report.

One more time, I am very happy and thankful for having this opportunity.

Ana Luisa Arocena

Pharmaceutical Chemist

Environmental Sciences Pos-graduated

Waste Management and Recycling Specialist

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