The International Union of Pure and Applied Chemistry (IUPAC)

The International Union of Pure and Applied Chemistry (IUPAC) is the world authority on chemical nomenclature and terminology, including the naming of new elements in the periodic table; on standardized methods for measurement; and on atomic weights, and many other critically-evaluated data.

A neutral and objective scientific organization, IUPAC was established in 1919 by academic and industrial chemists who shared a common goal – to unite a fragmented, global chemistry community for the advancement of the chemical sciences via collaboration and the free exchange of scientific information. Throughout its long history IUPAC has fulfilled that goal through the creation of a common language and the standardization of processes and procedures.

But IUPAC is about much more than nomenclature and the naming of elements. We are a leader in the provision of objective scientific expertise for the resolution of critical global issues that involve every aspect of chemistry, all of which have societal impact. Our scientific work is conducted largely through a formal project system, in which proposals from chemists around the world are peer-reviewed and, if meritorious, are approved and supported. In addition, IUPAC is involved in a wide range of diverse activities that ultimately impact both the chemical profession and society as a whole.

For almost a century IUPAC has contributed to the diverse and interdisciplinary field that is chemistry. We are the catalyst that unites chemists worldwide and we fulfill our mission by fostering sustainable development, providing a common language for chemistry, and advocating the free exchange of scientific information.

We are IUPAC – International and Unique, advancing Pure and Applied Chemistry worldwide!
Solvay is a multi-specialty chemical company, committed to developing chemistry that addresses key societal challenges. Solvay innovates and partners with customers in diverse global end markets. Its products and solutions are used in planes, cars, smart and medical devices, batteries, in mineral and oil extraction, among many other applications promoting sustainability.

Its light weighting materials enhance cleaner mobility, its formulations optimize the use of resources, and its performance chemicals improve air and water quality. Solvay is headquartered in Brussels and listed on Euronext Brussels and Paris. In the United States its shares are traded through a level-1 ADR program.

Manufacturers have to comply with ever more stringent regulations on CO2 and particulate emissions while meeting consumer demand for safer and more environmentally sustainable travel. Our solutions contribute to cleaner, safer and more energy-efficient modes of transportation. We produce lightweight materials for both the automotive and aerospace industries to help make vehicles and aircraft more fuel-efficient and cost-effective. We provide products that improve powertrain efficiency through effective thermal control and protection against corrosion. In the field of electric vehicles, we contribute to developing batteries offering higher energy density and greater power. Our high-performance silica reduces the rolling resistance of tires, which helps cut CO2 emissions, while we also produce rare earth materials that help reduce NOx emissions from diesel engines.

Solvay sustainable solutions for the oil and gas, mining, and energy generation and storage sectors help our customers offer their own consumers energy-efficient and environmentally-friendly products and services. We supply products tailored to the specific needs of all the key phases in the oil and gas value chain: exploration, production, stimulation, transport and refining. For the mining industry, our specialty reagents enable customers to improve productivity and reduce operating costs for the recovery of many metals and minerals. A number of our solutions are used to produce and store renewable energies and to improve energy efficiency. We also focus on environmental protection, supporting air and water treatment and soil remediation.
The IUPAC Safety Training Program

The IUPAC Safety Training Program allows safety training experts from developing countries to learn about safety and environmental protection by visiting plants of IUPAC Company Associates in the industrialized world. The Program is part of an initiative by the IUPAC Committee on Chemistry and Industry that includes sponsorship of Workshops on Safety in Chemical Production.

Safety Training Program Fellows are scientists and engineers at a supervisory or managerial level in chemical companies, government institutions or scientific institutions; engaged in aspects of safety and environmental protection in chemical, pharmaceutical, or biotechnological production or in the teaching of these fields; and have the ability to influence safety practices in their places of employment and elsewhere within their home country. Since 2000, nine Fellows from China, Egypt, Kenya, Nigeria, Turkey, and Uruguay have received training. Our recent trainees have an impressive record of success in effecting positive change in health, safety and environmental quality, and the Safety Training Program looks forward to continuing to contribute to capacity building in the developing world.

Training covers such areas as:
- Process safety management (PSM).
- Environmental protection.
- HAZOP analysis.
- Legislative measures and interaction between industry, universities, government and the public.
- Emergency planning and model studies.
- Responsible Care and its relevance to developing countries.
- Integrated approaches for health, safety and environment (HSE) at unit and company levels, and training of university teaching staff.
- ISO 9000 and 14000 series certification and practices.
- Material Safety Data Sheets (MSDS).

Responsibilities of Trainees

Safety Training Program Fellows will be assigned to IUPAC Company associates in industrialized countries. The period of training is typically one to three weeks. Accommodation, subsistence and travel expenses will be provided for all candidates selected to participate in the Program.

Safety Training Program Fellows are required to submit a detailed report to the Coordinator and to the Host Company. Fellows receive a Certificate confirming the successful completion of their training.

Fellows are invited to participate in biennial Safety Training Program Workshops at IUPAC General Assembly/Congresses, where they share experiences, best practices and plans with each other and participate in continuing efforts to enhance the Program.
SOLVAY SPECIALTY POLYMERS USA, LLC

POLICY FOR HEALTH, SAFETY, ENVIRONMENT AND QUALITY

Consistent with the policy of the Global Business Unit Solvay Specialty Polymers on health, safety and environment and quality, the most important objective of Solvay Specialty Polymers USA, LLC (SSPUSA) is to safely and responsibly produce and offer differentiated products, solutions and services to our customers while safeguarding the safety and health of our employees and surrounding communities. SSPUSA firmly believes that being excellent in health, safety, environment and quality (HSEQ) is crucial for generating a growing, successful and sustainable business.

This challenge is taken on through the continuous improvement of SSPUSA’s products, services and activities. SSPUSA will be:

- Committing efforts and ensuring compliance with all applicable regulations for health safety and environment (HSE), responsible care management system (RCMS) and adopted industrial standards for quality such as ISO 9001 and the Solvay Group’s Responsible Care Policy and sustainable development principles;
- Developing and implementing education and training of all employees to ensure awareness and knowledge, while targeting the prevention and continuous improvement in the areas of HSEQ;
- Adopting efficient HSEQ management processes based on procedures that are well-defined, communicated, and understood at all levels of the organization, and to continuously improve such processes and its focus on preventive measures, taking into consideration technical progress, scientific knowledge, the demands of the consumers and the expectations of the stakeholders;
- Implementing measures to ensure that HSE protection and product quality are given high priority in all our activities;
- Ensuring our facilities are built, operated and maintained in accordance with all applicable regulatory standards to protect the health and safety of our employees, the surrounding communities, and the environment, with the ultimate goals of no accidents, occupational injuries or illnesses, or harm to the environment;
- Promote a comprehensive approach to Product Stewardship and Sustainable Development in all aspects of our products’ life cycle including design, manufacturing, distribution, use, recycle and disposal activities.
- Committing to continuously improve the reduction of emissions, waste generation and the consumption of energy, raw materials and natural resources;
- Communicating with local agencies and communities regarding SSPUSA’s commitment to target continuous improvement in HSEQ
- Ensuring that HSEQ is given high priority in our products’ life cycle, including design, manufacture and distribution; and
- Providing the necessary resources and promoting the spread of behaviors, practices and procedures within the organization that are consistent with this policy.

SOLVAY SPECIALTY POLYMERS USA, LLC

By: ____________________________ Date 11/10/2014

George Corbin, President
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- Appendix 05- Solvay Code of Conduct
Executive Summary

Overall the IUPAC Safety Training Program conducted professionally and Solvay professional team delivered all the topics which agreed before in both Warrington and Brussels.

The level of STP arrangement by the Solvay team is really more than professional, all the logistics and accommodations were excellent organized with no issues.

Solvay Warrington Executive Summary

Warrington site leadership team set a clear Key Performance Indicators to margining both the leading indicators and lagging indicators along with a very clear implementations action plan involving all the people.

Solvay Warrington visit was a great chance to get hands on practices how the safety training deployment should be. The visit was including the field visit for the different aspect of process controls and process safety management along with the safety checks and audits methodology to make sure the compliance with the local UK regulation requirements and the international Process Safety Management best practices. Management of Change is the a millstone procedures and always considered for any change which could effects on the chemicals processing

Environmental management system and measuring the different impacts including the greenhouse gasses measures and monitoring to reduce the gas emissions as well as the energy saving approach

It is all about to engage and encourage the people for the safe behaviour and understanding the risk perceptions for the people to set and agree for the positive feedback process.

Showing strong management commitments is a key to empower the safety culture and moving to the next level by provide visible support and leading by example and walk the talk and reporting each single near miss as area for improvements

Communications tools and facilities at the site is very visible not only for the Solvay team but for the visitors, contractors and suppliers

Housekeeping and hygiene level is amazing in all the plant areas and the 5S Program is clearly implemented in the most plant areas
NOH Brussels Solvay Campus Executive Summary

NOH Brussels Solvay Campus is a state of art and best in class global headquarter and centre of research and innovations.

NOH Site has a fantastic general control system for security scanning and screening inside the NOH Premises with personal badges for all the visitors to be always used whiles existing inside the NOH.

Margining the safety program in the laboratories environments is really a challenge and needs a strong program in place with a real safety leadership and that what excitedly shown in the Material testing laboratories, Coating laboratories, Architected Material and processing hall.

Nanomaterial control measures are really impressive for the scientist and chemists whom working in the hazards dusty areas to prevent any unexpected events or any unexpected emergency cases.

Getting the chance to meet the safety corporate team was great and sharing the best practices for hot topics like hazard communications, REACH, Toxicity and Industrial Hygiene.

Practical training in both risk assessment for the laboratories activities and HAZOP studies with an ideal example for the best practices of personal safety program and the process safety program

Solvay Responsible Care Management System looks like a strong frame work to integrate national and international safety, health, environment, security and sustainability in on integrated system with an effective assessment tools to check the level of compliance across the different global business unities.

On the other hand the HSE Department of the NOH site conducting much SHE activities for the SHE training, visitors and contractors permitting, first aid and medical support facilities , emergency and fire protection management, control of safety equipment and management of incidents investigations and build the lesson learned communications tools and templates for sharing the best practice .
Best Practice

1) The online induction training for the Warrington Solvay site is a great tool to prepare the communication the site safety rules with the visitors.

2) The competencies assessment and the training records management system in the Warrington Solvay site was a mazing including an overall training plan and s separate specific file for each individual working in the site.

3) There are a lot of communication tools at the Solvay Warrington site which includes the communication board, safety signs, and the safety instruction booklet and site layout.

4) The management walk around site tour is a clear visible engage tools for the people working in the Solvay Warrington site.

5) The offline distributed control system (DCS Panel) is well established and designed to be used in emergency cases and un expected events which could happen in Solvay Warrington site.

6) The Warrington Solvay site has too many safety showers and safety eye wash to be used in case of emergency.

7) NOH confidential acceptance note for the NOH research and innovations site visitors is makes sense and an good example for the knowledge privacy management.

8) NOH laboratories work instructions is effective and simple and using the photos for the visualizing the safe operation procedures is working very well and makes the work instructions easy to follows.

9) NOH has a state of art for the employees welfare facilities and in particular the site restaurant is a mazing and fantastic hygienic place.

10) NOH Corporate team build a comprehensive information management system to manage all the data related to health, safety, environmental and sustainable data and the SAP System for the REACH Program is a prime example for that.

11) The NOH Workshop area is really impressive in terms of well organizing and the safety control measures was installed effectively in the work place.

12) The NOH has a fantastic sustainable firefighting training facilities where the associates may be trained for the firefighting, rescue and emergency response.

13) The NOH has a lot of ergonomics places and workstations by design.

14) The electrical energy consumption reduction practice working effectively across the automatic lights and lambs turn on and turn off which for sure positively affect the Solvay work environment.

15) As a part of Solvay social responsibilities, the student’s summer training program implemented for the young student people in annually basis and looks it is working very well with full support from the SIPP in the NOH site.

16) The reporting level of safety, health and environmental is developed every month to be shared with the leadership as well as the worker union and keep it dynamics developed and improved.
Area for Improvements and recommendations

1) It will be better if the IUPAC Safety Training Program to be available for a group of trainees, may be for financial reasons it is not easy, however, I think the payoff of will be maximizing for both hosting companies and IUPAC.

2) I recommend when it is applicable to communicates the IUPAC Safety Training Program at least three months early for the trainees in the devolved countries.

3) The NOH Induction training for the visitors needs to be developed to be faster arranged for the visitor and the induction exam is not available for non-French speakers which really challenge.

4) The majority of people working inside NOH Solvay campus is French speakers and most of the communications tools and resources was available only in French, I recommend to provide more resources in English for the foreigners and international visitors.

5) I recommend when it is applicable to integrate the work instructions as long with the visual 5S and the Solvay Life Saving Rules in one comprehensive sheet to be used in the fields.

6) The chemical security topics is typically a part of the responsible care program and I think these topic is still under developments globally out of US and required some efforts to be promoted globally and Solvay may help for that.

7) Like the NOH firefighting facilities training ones, I recommend to set up an internal practical safety training for the working at height, manual handling, Ergonomics, chemical storage, Lock out tag out, confined space enter and risk assessment to be all delivered locally in NOH premises and may be extended to cover the Europe region.

8) I suggest if the ergonomics risk assessment to be clearly integrated with the task risk assessment in one process and the purpose of that is to avoid the double work or confusing instruction overlap.
Following up plan for the IUPAC STP in Egypt / Middle East & North Africa Region;

Overall there is a lot to do following to the IUPAC STP in both professional level and business level to enhance the safety professional communities and chemical manufacturing companies.

Below is the action will be taken to sustain and maintain the message fresh across the Egypt / Middle East & North Africa region

1) I will manage a conference call for the safety professional in Egypt sharing the best practice and hands on practices for the SHE implementations.

2) I will Sharing the best practices and the new ways to improve the safety culture and initiatives with the Egypt / Middle East & North Africa chemical manufacturing unions and companies to enhance the concept of the continual and sustainability.

3) I will Deliver SHE training based on IUPAC STP with the ASSE Egyptian chapter in the next safety conference.

4) I will share the best practice for the SHE programs implementations with different customers during the customer safety visit.

5) I will participate the knowledge which I gain during the IUPAC STP in the following ECO - FEI - the Egyptian Compliance Office of the Federations Egyptian Industry- conferences and workshops.

6) Will contribute the thoughts and inputs with the safety and responsible care professionals in any professional events
**Accomplishments**

Complete the IUPAC STP as per as planned in both Solvay Warrington & Brussels and it was hands on practice for best in class safety, health and Environment management system.

At the end of the day it was an upgrading for personal & professional knowledge.

**Next Steps**

Sharing all the best practice at home institute and expanded the knowledge across the SHE professional in Egypt and public SHE communities Across the MENA Region.

Review, updates and upgrades the existing SHE polices and procedures for my home institute.

**High Level Timeline**

<table>
<thead>
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<th>Action plan list</th>
<th>2017- 2018 and 2019</th>
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<tr>
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<td>July –Aug</td>
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<tr>
<td>1 Sharing the SHE best Practices with the local Management team – Egypt LT.</td>
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<td>2 Review, update and upgrades the biological Hazard Risk Assessment procedures.</td>
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<td>3 Review the hazard communications considering the regulatory requirements for the LCPs – Labeling, classifications and packaging.</td>
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<tr>
<td>4 Conduct the Gap analysis for the ISO 45001</td>
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<tr>
<td>5 Set up web based SHE SharePoint site to sharing all the SHE policies and procedures with the employees.</td>
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<tr>
<td>6 Set up Online SHE Induction training for the site visitors, supplier and contractors.</td>
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<td>7 Establish SHE communication Program.</td>
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<tr>
<td>8 Review chemical warehousing procedure.</td>
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<tr>
<td>9 In house capacity building for the practical firefighting training on planet</td>
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<tr>
<td>10 IUPAC STP Conference call - Best practice sharing with Egyptian safety professional communities</td>
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<tr>
<td>11 SHE training based on IUPAC STP approach - Egyptian Society of Safety Professionals, ESSP</td>
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</tr>
<tr>
<td>12 SHE training based on IUPAC STP approach - ECO /FEI - the Egyptian Compliance Office of the Federations Egyptian Industry- conferences and workshops.</td>
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</table>
IUPAC Safety Training Program Details

Solvay Warrington

From Tuesday 2\textsuperscript{nd} of May – to Friday 5\textsuperscript{th} of May

Day 1
- Warrington site HSE Policy.
- Warrington Site Objectives.
- KPIs, Leadership.
- Standards.
- HSE Roadmap.
- Commitment.
- Warrington Safety committee.
- Housekeeping/5S.
- Visual Management.
- Safety Equipment Checks.
- PPE Standard.

Day 2
- HAZOP (method, Risk, SIL, Control measures).
- E+I (Loop testing).
- Mechanical Integrity (WSE, NDT).

Day 3:
- Environment.
- ISO 14001.
- IPPC.
- Pollution prevention measures.
- CO2 control.
- Waste management.
- Safety (Behavioral Safety, BBS program).
- Safety is Personal, PSD, and Competency).
- Management of Change.

Day 4:
- Responsible Care.
- Emergency Planning.
- Security.
- Laboratory (COSHH, SVHC).
- Management walk around.

NOH Research & Innovation Campus

From Monday 8\textsuperscript{th} of May to Thursday 11:

HSE organization and arrangement for
- Material testing laboratories and processing hall
- PPE, Instruction at work place
- work with dangerous machinery (DIRECTIVE 2006/42/EC)
- Physical risks: noise, burn, ergonomic concerns, work at height, control of the lifting equipment's
  - Analytical laboratories (PPE, chemical risks, electromagnetic field, ...)
  - Architectured Materials & Coatings laboratories (work in gloves box, control measures for nanomaterials)
  - Participation to risk assessments (workstation observation, assessment tools, assessing results etc....
  - Mandatory HSE training, HSE training follow-up
  - HSE dashboard, KPI etc....

NOH Corporate Friday 12 (1 day):
- Material Safety Data Sheets
- Product stewardship PSMS
- Transport safety
- Toxicology (to be selected : corporate organization, testing for toxic, the principles, toxic in GHS classification
- REACH
- hygiene
- Strategic sustainability assessment of product portfolio?

NOH site Monday 15 - Wednesday 17 (3 days):
- Day 1: am participation to a training (role and responsibilities of management) (in FR)
- Day 2: participation in a process safety HAZOP study (16.05) (whole day)
- Day 3 activities of the HSE Department of the NOH site : training, permitting, first aid and fire protection management, control of equipment and management of incidents

NOH and R&I trainers and experts team:
- Mrs Anne-Françoise Pattoux (Analytical laboratories, Materials & Coatings laboratories)
- Mrs Sandra Quintino (Hazard Communication and EH&S Management Corporate Manager)
- Mrs Patricia Villers (Product stewardship PSMS (Product Safety Management System)
- Mrs Valérie Verlinden (Reach Expert) - (European product regulation)
- Mr Eric Van Miert (Head of Toxicology Unit – Toxicologist)
- Mr Jean-Bernard Savoye (Occupational safety corporate expert) –
- Mr Pierre Coërs (sustainability stakeholder relations) - strategic sustainability assessment of product portfolio (SPM method)

Warrington trainers and experts team

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<thead>
<tr>
<th>CRB</th>
<th>Name</th>
<th>Job Role</th>
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<tbody>
<tr>
<td></td>
<td>Craig Barraclough</td>
<td>Site Manager</td>
</tr>
<tr>
<td>WA</td>
<td>Wayne Allen</td>
<td>Technical and Engineering Manager</td>
</tr>
<tr>
<td>BW</td>
<td>Brian Woodward</td>
<td>Electrical and Instrumentation Manager</td>
</tr>
<tr>
<td>BM</td>
<td>Bob Minson</td>
<td>Mechanical Engineering</td>
</tr>
<tr>
<td>MGG</td>
<td>Martin Griffiths</td>
<td>QHSE Manager</td>
</tr>
<tr>
<td>JMC</td>
<td>John McDonagh</td>
<td>Environmental Manager</td>
</tr>
<tr>
<td>JA</td>
<td>Jean Allen</td>
<td>HR Manager</td>
</tr>
<tr>
<td>IM</td>
<td>Ian Murdoch</td>
<td>Competency manager</td>
</tr>
<tr>
<td>JK</td>
<td>John Knight</td>
<td>Lab Manager</td>
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Solvay Warrington Induction Training

THE PURPOSE OF THIS INDUCTION

- The purpose of this induction is to minimise the risk of injury to yourself and those around you and any damage to the environment.

- The induction programme you are about to watch will take the form of a presentation containing important information as to the requirements and precautions needed to work on this site.

- In order to gain access to the Solvay site, you must have completed this induction programme and answered ALL the questions correctly. In the event of answering a question incorrectly, you will be given another question to answer, which corresponds to the relevant text.

- Access will then be allowed onto the site, where you will be required to work in a safe and professional manner.

- Should a contractor decide to bring any subsequent staff onto the site, they must also undertake and successfully complete this induction programme.

- Your Working Environment may be Factory, Warehouse or Office based and you may be required to complete a Display Screen Equipment Risk Assessment

SOLVAY WARRINGTON CULTURE

- All injuries, however minor, must be reported to Security for First Aid treatment.
- Please report all INCIDENTS and NEAR MISSES (to your contact) so that we can learn from them and prevent a serious incident.
- We encourage a culture of “Positive Safety Discussions” (PSDs) to maintain and improve our safety performance. Please co-operate with our staff if you are involved in such discussions.
- Please be polite and courteous whilst you are on our site
EMERGENCIES

- On discovering a fire you must raise the ALARM by using a BREAK GLASS POINT, or ring 3666 from an internal phone, or 01925 643333 from a mobile phone.
- On hearing the fire alarm, you must evacuate the plant or work area immediately and report to the nearest assembly point. This will be indicated to you by your Permit Issuer or Host. If in doubt report to the Gate Office Assembly Point.

Report any details of the fire and your presence to the Fire Marshal.

PERMIT TO WORK

- A permit to work must be obtained before starting any work on site, this includes the area immediately before the security barriers i.e. roadways, houses and car parks along Baronet Road.

To obtain a permit to work, an appropriate risk assessment and method statement must be provided to the permit issuer at least 24 hours prior to the work starting.

- The site operates a two tier permit system:
  - a “General Permit” is required for all work.
  - in addition, if the work involves activities that are medium or high risk then an additional “Special Permit” is required.

With the exception of some “Special” permits, all permits cease at midnight. Therefore, if work is continuing the next day, you must obtain a new permit each day.
HAZARDS ON SOLVAY SITE

The main hazards found on site are:

- Mechanical
- Electrical
- Thermal
- Chemical
- Radiation

These can be found in the form of:

- Vehicle Movements
- Slips, Trips & Falls
- Chemicals
- Fire & Explosion
- Noise
- High & Low Voltage Electricity
- High & Low Pressures
- Potential Bio Hazards

Perception of the Risk

- Risk perception is a highly personal process of decision making, based on an individual’s frame of reference developed over a lifetime, among many other factors.
- How many people do you need in a room to have more chance than not of sharing a birthday?
- Risk perception is a highly personal process of decision making, based on an individual’s frame of reference developed over a lifetime, among many other factors.
- Risk perception is a highly personal process of decision making, based on an individual’s frame of reference developed over a lifetime, among many other factors.
Solvay Life Saving Rules

1. Work at height
2. Work on powered systems
3. Line breaking
4. Work in confined spaces
5. Work in explosive atmosphere
6. Lifting
7. Excavation
8. Traffic

✓ Protect yourself and your tools from falling when working at height
✓ Isolate and de-energize mechanical and electrical equipment before starting the work
✓ Obtain authorization before starting line or vessel opening
✓ Be sure that atmospheric conditions are continuously monitored and a safety attendant is standing by before entering a confined space
✓ Do not enter any area that has a potentially explosive atmosphere with objects which could generate a spark or ignition
✓ Do not stand or move under or in the vicinity of a lifted load
✓ Stay out of the line of fire of excavators, trucks and non-stabilized earth
✓ Respect the traffic rules
Process Safety Introduction
Process Safety is a disciplined framework for managing the integrity of operating systems and processes handling hazardous substances by applying good design principles, engineering, and operating practices. It deals with the prevention and control of incidents that have the potential to release hazardous materials or energy. Such incidents can cause toxic effects, fire, or explosion and could ultimately result in serious injuries, property damage, lost production, and environmental impact.

Risk and Criteria
The purpose of this step is to develop the context for the risk assessment and to define risk criteria that will be used for evaluation of well integrity risks. The deliverables from this step are:

- risk assessment scope;
- list of risk criteria

Defining risk criteria
Risk criteria for evaluating the significance of well integrity risks need to be defined by the project developer. The risk criteria should reflect the objectives and context for the risk assessment. Adequate consideration should be given to the time and resources available, stakeholder views and risk perceptions, and the applicable legal and regulatory requirements. The risk criteria chosen should be continuously reviewed.

Risk Assessment
As part of managing the health and safety of your business you must control the risks in your workplace. To do this you need to think about what might cause harm to people and decide whether you are taking reasonable steps to prevent that harm. This is known as risk assessment and it is something you are required by law to carry out. If you have fewer than five employees you don't have to write anything down. A risk assessment is not about creating huge amounts of paperwork, but rather about identifying sensible measures to control the risks in your workplace. You are probably already taking steps to protect your employees, but your risk assessment will help you decide whether you have covered all you need to. Think about how accidents and ill health could happen and concentrate on real risks – those that are most likely and which will cause the most harm.

For some risks, other regulations require particular control measures. Your assessment can help you identify where you need to look at certain risks and these particular control measures in more detail. These control measures do not have to be assessed separately but can be considered as part of, or an extension of, your overall risk assessment.
Solvay process Safety Management program and Key Element:

- Timing of the Hazard Study
- Hazard Study Team
- Project program – Timing of the hazard studies
- Typical team members
- Selected guide words
- Break the process into nodes
- Identifying causes of the deviations
- Identify immediate and ultimate consequences
- Review the protective measures
- Recording
- Recommendations for further actions
- Safety Inspection
- IEC 61508/61511 SIL Determination
- Risk Graph and other Tools
- Demand Trees and Fault Trees
- Human Error
- PROOF Testing
- Hazard and Risk assessment
- Allocations of safety functions to protection layers
- Safety requirement specification
- Design and Engineering
- instillation, commission and validation
- operation and maintenance
Environment

Agenda: ISO 14001, IPPC (Environmental Permitting) Licenses and Consents (including C02 control), Pollution prevention measures, Waste management

ISO 14001

- An EMS (Environmental Management System) is part of an organisation’s management system used to develop and implement its environmental policy and manage its interaction(s) with the environment. ISO 14001 is an internationally accepted standard that sets out how you can go about putting in place an effective EMS
- Key requirements:
  - An environmental policy (commitment to legal compliance & pollution prevention)
  - A register of legal requirements
  - An assessment of the company’s activities, products, processes and services that might affect the environment (significant aspects and impacts).
  - An environmental improvement programme.
  - Periodic evaluation of compliance
  - Written procedures to control activities with a significant environmental impact.
  - A monitoring programme
  - Periodic auditing of the system to ensure effective operation.
  - A training and awareness programme.
  - A formal management review of the EMS by senior management
Site Environmental Permits, Licenses and Consents

As a chemical manufacturer the Warrington site has a number of environmental regulatory controls that are set to manage and reduce our impact on the environment. The diagram below shows a range of our environmental aspects that can impact on the environment and ultimately affect our way of life, be it air quality (e.g. low level ozone, dust, acid rain), global warming impacts (e.g. floods, droughts, temperature extremes), water quality (e.g. eutrophication, polluted water ways & groundwater, drinking water standards) and land condition.

Permits, Licenses & Consents at Warrington

Environmental Permit – the Environment Agency (EA) regulates the operation of the AO plant and Combustion process by granting an Environmental Permit (formerly known as an IPPC Permit). The Permit has legal conditions surrounding routine monitoring to demonstrate compliance with limits for releases to air & water and to demonstrate resource efficiency. There are 58 monitoring requirements and 18 emission limits which have to be reported on routinely. The Permit also has general legally binding conditions for:

- operational changes (formal written agreement required by the EA)
- prevent emissions to groundwater (routine monitoring programme)
- management (implement a management system)
- maintain plant & equipment in good operating condition
- using energy efficiency
- efficient use of raw materials (i.e. 4yrly audits)
- waste storage & disposal (BAT to store safely & recover/dispose)
- accident prevention (maintain accident management plan)
- noise and vibration (prevent & reduce noise from the site)
- notifications to EA (abnormal releases or breach of limits)
Greenhouse Gas Permit – Required as site combustion activities exceed 20 MW. Forms part of a EU Emissions Trading Scheme (EUETS) which is essentially a financial incentive to reduce carbon dioxide (CO2) emissions. EUETS operates in 31 countries and covers 45% of the EU's greenhouse gas emissions (i.e. over 11,000 installations). For Solvay it covers the site’s combustion activities (mainly the boiler-house). Solvay are provided with an allowance of CO2. The allowance is currently based on historical emissions. In 2016 the Solvay free CO2 allowance was 9,553te. However, actual Solvay CO2 emissions were 10,115te. Additional allowances of CO2 have to be bought on the open market under the Trading Scheme. The overall pool of CO2 reduces over time, as have the site’s allocations (2017 allocations 9,372). Monitoring of the site combustion CO2 emissions is tightly regulated and internally and externally verified prior to reporting to the EA (Environment Agency). Transfer of CO2 allowances from EUETS registry account (i.e. Solvay’s CO2 bank account) is strictly controlled by use of EA authorised users only.

Water Abstraction Licence – this allows Solvay to abstract groundwater, within limits, from 6 deep boreholes, 4 on site, 2 off site for cooling purposes. Our typical abstraction rates are 500m3 per hour. Volumes have to be measured accurately, records kept and reported routinely to the EA. We have to justify the water use and use it efficiently. Fees are also paid to the EA (ca £21,000/yr) based on volumes used and type of usage, e.g. cooling tower use attracts a high loss factor due to evaporation. The water quality at various depths around key boreholes has to be monitoring quarterly to check for saline intrusion.

Trade Effluent Discharge consent - This consent allows Solvay to discharge contaminated effluents to sewer and covers the whole site activities (i.e. Solvay & Perstorp). It is granted by United Utilities (UU) who also police it. The consent includes limits for max volume and rate of discharge, temperature, pH and a number of substances which must be eliminated from or limited in the effluent. The effluent is filtered and biologically treated by UU at their Warrington North Treatment works and is ultimately discharged to the River Mersey. Effluents have to be carefully monitored by us to ensure compliance with limits and avoid any abnormal releases. The site typically discharges 40 m3 per hour of effluent to sewer and pays over £380,000 per year in effluent charges of which Solvay’s contribution is around £175,000.

**C02 Control & other Resource utilisation**

Planning Consent HGV Moves - Access to the Warrington site is via a residential area and therefore to minimise the impact on the local community the site has been set a limit of 620 HGV moves per week. This was part of planning consent granted in 1997. HGVs have be logged by Security and reported to the local authority every 6 months. We also voluntarily minimise sensitive hour HGV moves.
As discussed earlier the site combustion activities are regulated under it’s Greenhouse Gas Permit and EU Emissions Trading Scheme (EUETS). For CO2 associated with electricity use the site has entered into a Climate Change Agreement (CCA) with the Government to improve it electricity consumption. By having a CCA the site receives a rebate on the normal Climate Change Levy (CCL) applied to invoices. 90% rebate for electricity, 65% for gas.

Resource utilisation (e.g. energy, water etc) is routinely monitored and reviewed and Kpi’s established. 2015 saw a major investment in process heat recovery unit for the hydrogen peroxide plant saving 25% in steam usage and reducing CO2 emissions by around 3,900 Te for the year. This also reduced cooling water consumption. The site’s main use of cooling water is derived from once used (i.e. recycled water) and a formal corporate review of the sustainability of it’s water supplies (i.e. abstraction and towns water) has been undertaken. In 2015 a detailed energy study (SOLWATT) was undertaken utilising a team with expertise throughout the Solvay Group to identify potential areas for improvement and in 2016 a site Energy & Utilises team was established to implement these and other improvements. Monthly Energy Team reports are published and posted on Notice boards showing progress and to help generate new ideas.

Pollution Prevention Measures

There are a range of pollution control measures utilised on site:

- **Bunding**: This is secondary containment normally a retaining wall around a storage tank of hazardous substances to create a bund. Standard for bunds to hold 110% of tank capacity, or 25% of capacity of a tank farm)
- **Carbon adsorption on the AO plant for the Oxidation off gas** (Limits on releases continuously monitored with online Flame Ionisation Detectors)
- **Tanker off-loading spill protection**
- **Effluent pH correction**
- **Outfall Monitoring station online measurement & alarms on TOC, pH, Flow, Temperature, Turbidity**
Waste Management

For management of waste regulation the site has detailed processes in place with a Duty of Care register showing all wastes it generates, their waste classification, the companies that treat the waste and their carrier registrations, the treatment site used, their permit/licence references and lastly a review the Waste Hierarchy. In addition a file is kept up to date of the actual waste carrier registration details taken for the EA website so as to ensure are still valid. Also copies of treatment site permits/licence are kept for review of their legitimacy to accept the waste generated by Solvay. Furthermore hardcopy file are kept of the waste documentation including waste transfer notes, hazardous waste consignment notes and weighbridge tickets. Electronic files are kept of waste weights and categorisation of wastes for internal and external reporting purposes.
Solvay Internal Service for Prevention and Protection at Work (SIPP)

The SIPP serves all users of the site, entities and management teams to ensure regulatory compliance activities, the welfare of each employee, the prevention of accidents and incidents, the promotion of health, ergonomics and comfort of the workplace, safe travel.

It contributes, in accordance with Group policy, health and human safety, environmental management and sustainable development of the Solvay Campus activities.

- Risk analysis
- Workstation Analysis
- Ergonomics and Industrial Hygiene
- Prevention and monitoring of claims
- Awareness, information and training
- Regulations and standards
- Site security and internal emergency plan

7 key points for Newcomer or Brussels site staffs for many years, always have in mind the essential safety!

- **Knowing the work areas**, emergency numbers, warning signals, emergency exits, the location of
- **Agree and follow** a training program, empowerment and recycling to specific occupational hazards
- **Establish** an occupational exposure risk profile
- **Organize** the ergonomics of your work environment
- **Being well equipped**
- **Knowing the instructions** sorting and removing recoverable waste
- **Moving security** (compliance with the code of the road, holding handrails, do not run, respect of driving time, factory safety information and hotel, good use of GSM,
INDUSTRIAL HYGIENE

Strong Industrial Hygiene program, with a special focus on SVHC

To control potential exposure to chemicals, Solvay’s 2020 target is for all risk assessments at the workplace to be completed and managed using the new Solvay standards for industrial hygiene. Focusing particularly on Substances of Very High Concern, the Industrial Hygiene program encompasses:

- comprehensive chemicals inventories at every operational site, with a special focus on the substances of very high concern that have a detrimental impact on health;
- relevant, standardized and effective screening of potential risk of overexposure to chemicals: the CTES (Critical Tasks Exposure Screening tool) is used to quickly spot situations where exposure to chemicals requires special attention and additional control measures;
- detailed risk assessment for identified potentially critical situations and for all potential exposures to Solvay SVHC substances;
- deployment of the new Solvay tool (SOCRATES) giving wide and easy Intranet access to all methods, tools and databases.

The Group is reinforcing ad hoc prevention measures for workers potentially exposed to particular risks: a limited number of well-identified “operations” possibly incurring higher health risks due to SVHC handling conditions are being mapped worldwide.

Solvay Occupational Exposure Bands for industrial hygiene

Solvay’s Occupational Exposure Band (OEB) system determines the acceptable exposure levels to be observed, when there are no established national Occupational Exposure Limits, or international Threshold Limit Values (TLVs), or in-house Solvay Acceptable Exposure Limits. This system is very relevant, as nearly 90% of our chemicals have no TLV or SAEL (Solvay Acceptable Exposure Limits are internal exposure limits dedicated to our most important products). This OEB system also gives a simple, quick and easy to understand hazard ranking from the least hazardous to the most hazardous.

Critical Tasks Exposure Screening

Solvay designed the Critical Tasks Exposure Screening (CTES) tool to efficiently pre-screen all critical exposures to chemicals at the workplace. It plans to complete a seven-year project to assess or reassess all workstations with the CTES tool by 2020. At the end of 2016, 3,900 working units had been identified as requiring CTES, and 80 operational sites had been identified as requiring more detailed analysis. A key feature
of CTES is empowering shop-floor staff to take part, resulting in better “appropriation” of corrective measures by these employees.

**Global tool for industrial hygiene management (SOCRATES)**

SOCRATES is Solvay’s global IT tool for industrial hygiene management. The Group uses this application to more efficiently identify and assess all industrial hygiene risks, enhance data traceability and empower operating staff. Developed between 2014 and mid-2015, this application was tested at eight pilot sites during summer 2015. In 2016, 18 new sites were trained, and 1,500 workers already have a chemical assessment in the new tool.

**Solvay’s pledge for access to sanitation at the workplace**

Access to good sanitary hygiene conditions is a basic, but key requirement to allowing good individual hygiene and health protection at work: handwashing, safe drinking water, and access to adequate sanitary facilities are all integral elements of occupational hygiene and preventive health. This is why Solvay has adhered to WBCSD’s “Pledge for Access to Safe Water, Sanitation and Hygiene in the Workplace” since 2014.

The “pledge for Access to Safe Water, Sanitation and Hygiene at the Workplace” means, in practice:

- Availability of sufficient, safe, acceptable, and physically accessible drinking water for personnel and contractors on-site;
- Accessibility of water for washing and personal hygiene, and for medical first aid;
- Appropriate handwashing behaviors;
- Managing and reporting water-related diseases;
- Privacy for toilets.

A first assessment in 2015 focused on six main manufacturing sites in China, based the self-assessment grid drawn up by WBCSD. Handwashing practices were identified as the most frequent area for improvement at these sites, and an locally-implemented educational program took place in 2016 regarding hand-washing and sanitation.
Principles of Responsible Product Stewardship

1. Shared Responsibility: Take responsibility to ensure products are managed safely throughout their lifecycle for the products that you supply, manufacture, distribute, use, dispose/recycle or regulate. The manufacturer of a product does not have complete control over every actor throughout a product's lifecycle. No matter how "foolproof" a product is, each of us has an obligation not to be foolish.

2. Lifecycle Thinking: Work to prevent or significantly reduce risks and increase sustainability throughout the product lifecycle. This could range from simple communications to redesign to regulations to withdrawing the product from the market. A product take-back program may be an effective and efficient component of product stewardship in some cases, as might substituting safer components. But beware of unintended consequences as you fix one problem only to create another.

3. Knowledge: Understand the potential environmental, health and safety risks of your actions – the inherent hazards associated with the materials you use and the exposures you may cause. In addition, understand how others in the product's lifecycle impact risk. The biggest burden for developing knowledge of a product's hazards falls on the manufacturer because it defines what the product is. Understanding the other necessary component of risk, exposure, is tougher. The challenges of acquiring the right kinds of information are addressed by some of the principles below and are the subjects of vigorous discussions around science, business proprietary information, transparency and public policy on what and when something is "safe enough."

4. Supply Chain Communication: Share information necessary for others to understand hazards and manage exposures in their portion of the supply chain. Products are part of complex systems involving a series of suppliers and customers (including waste handlers). You need to help those upstream and downstream from you minimize total lifecycle impacts and use more sustainable practices.

5. Stakeholders: Understand the concerns of the range of stakeholders who influence the success of the product – employees, stockholders, suppliers, neighbors, governments, peers and public interest groups. Determine what you need to do to assure these stakeholders that a product is being managed safely. Work together to find the best solutions that preserve benefits and reduce risks. Stakeholders determine what is "safe enough."

6. Teamwork: Determine who knows the what, where, why and how of a product to find more sustainable solutions. Product stewards do not work alone. They must work closely with and rely on experts who understand each aspect of a product's lifecycle so that risks can be characterized and controlled (manufacturing, marketing, research, legal, health and environmental, public affairs, etc.). Expert teams are also needed to continue developing reliable standards to evaluate and communicate risk information to customers.

7. Awareness: Watch for new information relating to risks and safer products. Have processes in place that manage and quickly respond to changes that can impact product safety such as changes in resources, processes, science, technologies, uses,
users/customers and societal and regulatory expectations. Try to anticipate and get ahead of changes.

8. Innovation: A commitment to product stewardship stimulates innovation in reducing risks and improving value to meet customer and societal needs with new and better products and processes. Building in sustainability and safety during the product design phase is the most effective way for a company to accomplish product stewardship.

9. Management: Implement practices that will continually move product stewardship forward. An ongoing plan-do-check-act cycle and all the other management tools you already use apply to product stewardship just like any other activity. Most importantly, product stewardship is not a one-time project; it’s a way of thinking and acting responsibly.

10. Integration: Product stewardship should be integral to how a business operates and be part of the culture. It cannot be a stand-alone program performed by a staff group in a far off branch of an organization chart. Every function contributes to the lifecycle impacts of a product. Individual consumers also need to be product stewards whenever they buy, use and discard any product. We should all ask ourselves, "Is this the responsible thing to do?" The principles of product stewardship should become common sense.

REACH

Introduction

REACH (EC 1907/2006) aims to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances. This is done by the four processes of REACH, namely the registration, evaluation, authorisation and restriction of chemicals. REACH also aims to enhance innovation and competitiveness of the EU chemicals industry.

"No data no market": the REACH Regulation places responsibility on industry to manage the risks from chemicals and to provide safety information on the substances. Manufacturers and importers are required to gather information on the properties of their chemical substances, which will allow their safe handling, and to register the information in a central database in the European Chemicals Agency (ECHA) in Helsinki. The Agency is the central point in the REACH system: it manages the databases necessary to operate the system, co-ordinates the in-depth evaluation of suspicious chemicals and is building up a public database in which consumers and professionals can find hazard information.

One of the main reasons for developing and adopting the REACH Regulation was that a large number of substances have been manufactured and placed on the market in Europe for many years, sometimes in very high amounts, and yet there is insufficient information on the hazards that they pose to human health and the environment.
**REACH Implementation**

**Registration, Evaluation, Authorization AND Restrictions**

**Registration**

Manufacturers and importers of substances have a general obligation to submit a registration to the European Chemicals Agency for each substance manufactured or imported in quantities of 1 tonne or more per year per company (legal entity).

This obligation applies to substances as such and in mixtures. A special registration regime applies for substances in articles (e.g. manufactured goods such as cars, textiles, electronic chips).

**Evaluation**

Evaluate the information submitted by companies to examine the quality of the registration dossiers and the testing proposals and to clarify if a given substance constitutes a risk to human health or the environment.

**Authorization**

Substances of very high concern will be gradually identified in the 'Candidate list' and eventually included in Annex XIV of the REACH Regulation. Once included in that Annex, they cannot be placed on the market or used after a date to be set (the so-called "sunset date") unless the company is granted an authorization.

**Restrictions**

REACH includes a restriction process for certain substances of very high concern if they pose an unacceptable risk to health or the environment. Such substances may be limited or even banned, if necessary. The restriction is designed to manage risks that are not addressed by the other REACH processes or by other Community legislation.

**Combination effects of chemicals**

Throughout our lives we are exposed to a variety of chemicals, contained in food, water, medicines, the air we breathe, cosmetics and health care products, shoes, clothing and other consumer products. In the natural
environment, living organisms are also exposed to a complex cocktail of chemical substances.

Current regulatory approaches to the assessment of chemicals are usually based on the evaluation of single substances, chemical by chemical. The assessments include safety margins to take account of uncertainties, such as how exposure to many different chemicals may affect humans and the environment. However, there are concerns that this does not provide sufficient security and that the combination effects of chemicals should be addressed in a more systematic way.

**Solvay REACH training Program topics and content:**

1. REACH-Regulation
   - Definitions & Scope
   - Time-frame
   - The different roles and obligations within REACH
2. Registration process
3. Evaluation of dossiers & substances
4. Authorisation & Restriction process
5. REACH enforcement & REACH Internal Audit
6. Archiving
Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

Chemicals, through the different steps from their production to their handling, transport and use, are a real danger for human health and the environment. People of any ages, from children to elderly, using many different languages and alphabets, belonging to various social conditions, including illiterates, are daily confronted to dangerous products (chemicals, pesticides, etc.)

To face this danger, and given the reality of the extensive global trade in chemicals and the need to develop national programs to ensure their safe use, transport and disposal, it was recognized that an internationally-harmonized approach to classification and labelling would provide the foundation for such programs. Once countries have consistent and appropriate information on the chemicals they import or produce in their own countries, the infrastructure to control chemical exposures and protect people and the environment can be established in a comprehensive manner.

The new system, which was called "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)", addresses classification of chemicals by types of hazard and proposes harmonized hazard communication elements, including labels and safety data sheets. It aims at ensuring that information on physical hazards and toxicity from chemicals be available in order to enhance the protection of human health and the environment during the handling, transport and use of these chemicals. The GHS also provides a basis for harmonization of rules and regulations on chemicals at national, regional and worldwide level, an important factor also for trade facilitation.

While governments, regional institutions and international organizations are the primary audiences for the GHS, it also contains sufficient context and guidance for those in industry who will ultimately be implementing the requirements which have been adopted
Solvay Hazard Communications program

The Objectives:

Compliance & consistency

- Provide and deploy programs, guidelines, standards, tools, expertise and support in line with the Group HSE policies regarding **Hazard Communication**
- Ensure compliance & harmonization of **Safety Data Sheet** content worldwide
- Manage a single repository of consistent product **SAP EHS database**: SAP EH&S (Pure sub, phrases, rules, …)

Expertise coordination & traceability

- Manage interactions for compliant SDSs with TERA, Transport, Physicians, Hygienists, Zone and Product Stewards with critical eyes
- Ensure **traceability** and the **archiving** of all historical SDS and supporting information

Prospective & anticipation

- Follow the **Regulatory evolution** and alerts or applies the necessary changes in the SDS

Integrated service (on demand service)

- Provide necessary SDS for each product and its different grades
- Provides the labels (pre-label prototype) of the packaged products
- Publish **GPS Safety Summaries** for substances in commerce registered, in order to give the general public access to relevant and reliable safety information on Solvay chemicals, in collaboration with Product Stewards, GPA and TERA

Final distribution

- Provide solutions and support to Product Stewards in the **automatic distribution** of SDS to customers
Solvay Hazard communications Program Core Services:

- Ensure SDS compliance & SDS integrity (incl. processes and audits)
- Support the business on SDSs and pre-labels WW expertise (languages, C&L systems, SDS templates, EH&S rules, …)
- Coordinate with other experts concerning regulatory data, SDSs and labels (Product Steward, HSE zone experts, Transport, TERA, Hygiene, Physicians, Environment, …)
- Follow-up and Impact analysis concerning new regulations (GHS, …) & new local standards with impact on SDSs and labels. Inform GBUs
- Perform training for GBUs and SDS writers on EH&S tools, SDS and labeling
- Support to Zone Process Owners, SDS writers and other GBU contacts regarding tools, regulations and templates
- Manage templates, phrases, rules, product regulatory data
- Safeguard data in Pure_Sub and changes impact analysis
- Archive and track history of changes
- GPS Safety Summaries follow-up (for all GBU in Europe)

Solvay Hazard communications Program Scope and organization

- About 6 000 substances used in 13 000 products (70% formulations) put on the market
  - strategy to focus on substances
- Corporate team is responsible for:
  - Monitoring the regulatory changes impacting Solvay
  - Manage Pure Substances classification and information
  - Administrate the system SAP EHS
  - Expert recommendations are embedded in the rule sets

Product Stewards and SDS writers rely on the rules for classification of finished products and SDS authoring
- Population of about 80 active users

- Almost 90 standard rules used to cover 26 countries plus the general United Nation level
- New businesses acquired are systematically integrated into the common EHS database
Solvay Basic Training for Toxicology and Risk Assessment

1. Toxicology: Basics
2. Ecotoxicology: Basics
3. Risk Assessment

**Toxicology:**

**Goals of Toxicity and Ecotoxicology studies**

- Characterize onset, incidence, severity, duration and potential reversibility of toxic effects
- Identify potential target organs of toxicity (histopathology)
- Characterize test substance toxicokinetics and metabolism (potential toxic metabolites)
- Identify safety parameters to be monitored in humans (workers and/or general population)
- Identify No Observed Adverse Effect Levels (NOAEL) allowing calculation of safety margins

**Toxicological Endpoints**

- Toxicokinetics
- Irritation/corrosion
- Skin sensitisation
- Acute toxicity
- Repeated dose toxicity
- Genetic toxicity ("Mutagenicity")
- Carcinogenicity
- Reproductive and developmental toxicity
- Others

**Ecotoxicology**

**Toxicological Endpoints**

- Distribution and destiny in various compartments
- Acute toxicity
- Chronic toxicity
- Fate / Degradation
- Bioaccumulation
- Others
Risk assessment
Leadership Safety Visit (LSV)

LSV Goals & Objectives

✔ Remind people that safety is the Group’s PRIORITY
✔ Make Management’s commitment to safety visible
✔ Be present in the field to understand the operators real work situation
✔ Contribute to raise risk awareness
✔ Use the progress levers of the Safety Initiative in an open-minded spirit to encourage exchanges
✔ Challenge and support sites in order to reach the Group’s Safety targets
✔ Challenge and support sites in order to reach the Group’s Safety targets

Basic principles of an LSV

Each BU or Function Management Team member will carry out four LSVs per year (one each quarter, lasting 1 hour on-site).

✔ The LSV is a constructive dialogue, involving an exchange of perceptions; it is an open discussion in order to identify and understand:
✔ Work practices of supervisors and operators
✔ Risk situations or behaviors
✔ The misunderstanding felt by operators when faced with insufficient or unexplained rules
✔ Good practices to encourage
The Solvay care Management System

Responsible Care Management System Requirements- system brief introduction

Policy and Leadership

Policy establishes an overall sense of direction and sets the principles of action for an organization. It sets the overarching goal as to the level of responsibility and performance required of the organization and against which all subsequent actions shall be judged. Responsibility for setting policy rests with the organization’s senior management.

Planning

An organization shall formulate a plan to fulfill its policy. The organization shall understand its hazards, risks and impacts, both inside and outside the fence line, including those related to the organization’s products. Planning is an ongoing process which can be impacted by numerous internal and external events and activities.

Implementation, Operation, and Accountability

For effective implementation, an organization shall develop the capabilities, support systems and resources necessary to achieve its policy, objectives and targets. Implementation is a dynamic continual improvement process. An organization shall focus and align its people, systems, strategy, resources and structure in order to achieve its objectives consistent with the Responsible Care Guiding Principles.

Performance Measurement, Corrective and Preventive Action

An organization shall measure, monitor and evaluate its performance. There shall be a system to measure and monitor actual performance against the organization’s objectives and targets. Systems shall also exist to plan and implement appropriate corrective and preventive actions.

Management Review

The organization’s management shall, at appropriate intervals, conduct reviews of the RCMS to ensure its satisfactory operation and promote continual improvement. This review shall be broad enough in scope to address the Responsible Care dimensions of its activities, products or services.
Solvay Care Management System Framework

Solvay Sustainable Portfolio Management Model

Deliver on societal challenges with a pioneering spirit, and be recognized a Chemist part of the Solutions
Build innovative ecosystems in line with circular economy principles, to develop partnerships for Sustainable Solutions

Contribute to Society
Act Responsibly with Solvay way

SOCIETAL ACTIONS
x2 employees involved in societal actions

SUSTAINABLE PORTFOLIO MANAGEMENT
x2 the share of sustainable solutions in the Group portfolio to 10% from 25% in 2014

SOLVAY way
doing business, being responsible

CO2
-40% Carbon intensity

SAFETY
-50% of occupational accidents with MTAN x 0.00

PEOPLE ENGAGEMENT
+5 pts: Increase the employee engagement index to 80% from 75% in 2014