Other entries received, illuminating Responsible Care diversity

JURY PROCESS: The jury discussed each category prior to nominating overall winners and commendations. The table below presents the results of their deliberations. A brief summary of all entries, excluding overall and commendation winners, follows.

CATEGORY WINNERS (8 categories)		
Communications	BASF SE, Germany	Innovation-friendly framework conditions for new technologies
Distribution	TOTAL Bitumen GmbH, Germany	Optimisation of transport safety for hazardous goods
Energy efficiency	Trinseo Benelux, Netherlands	Energy efficiency improvement through steam re-compression
Environment	DSM Nutritional Products, UK	Dalry Sustainability programme
Occupational Health & Safety	Chemical Industry Federation, Finland	GOOD MORNING - GOOD TOMORROW
Process Safety	Celanese	Lessons Learned Program
Product Stewardship	Akzo Nobel, Netherlands	Priority substance program
Security	Chemical Business Association (CBA), UK	Chemical Security

COMMUNICATIONS CATEGORY

Sustainable development through engagement with stakeholders

Allergan Pharmaceuticals

Casting a wide net - embracing employees, neighbours, local businesses, contractors and raw material suppliers - Botox producer Allergan (bought in Q1 2015 by Actavis for US$70bn) began its sustainable development project in 2014. Starting with internal operations,.using an 'Eco-cost' model, a number of products were scrutinised in a lifecycle analysis that informed decisions on product design and packaging, sourcing locations and the mode of distance of transport to minimise environmental impact. Additionally, it's 'Switch it Off' Christmas 2014 campaign saved over US$63k in electricity, natural gas and water costs.

Partnering with the Smarter Travel Workplace Programme the company promoted walking, cycling and carpooling to reduce car use. Having logged >1,600 Smarter Travel journeys in a six-week period, Allergan continues to offer car-pooling incentives, a bike to work scheme., on-site shower facilities and 'pedometer challenges.'

Local businesses were invited to showcase the sustainable products and services they provide at a two-day 'Earth Fair' which attracted organic farmers, cloth-makers, recycled plastic furniture makes and energy efficiency product providers. In the local community Allergan volunteers painted the Western Cape building used by people with learning and associated disabilities. More than 40 engineers and contractors - on site to implement 2014 projects - were given environmental training aimed at raising awareness of bunding requirements, drainage, waste segregation and refrigerant gases management. Supplier and waste vendors were due diligence audited as part of the sectors' Pharmaceutical Supply Chain Initiative.

*Innovation-friendly framework conditions for new technologies -**Category Winner***

BASF SE

Early bird BASF bagged the judges' winner of category albeit with the consensus caveat that pulses were not set racing by this set of entries. When BASF launched its first nanomaterials safety research project in 2004 - investigating the skin penetration of $Ti0_2$ and Zn0 nanomaterials in sunscreens - it began an open dialogue with NGOs, stepping into the fray of political and public debate. Since then BASF has conducted over 180 toxicological and eco-toxicological studies underpinned by the belief that safety research means going beyond regulatory compliance and is strengthened by alliances with a variety of partners to raise the credibility and acceptance of its work. The overarching objective is to be transparent, to contribute to and help shape the evolving scientific, political and public debate.

In 2008, with DialogForum Nano, BASF initiated meetings between its nanotechnology experts, environmental and consumer groups, trades unions, churches and sustainability institutes to discuss political and social issues. Three dialogues - each lasting one to two years - have happened in Germany and a fourth is ongoing in Brussels. These dialogues act as 'an early warning system' flagging critical issues and final reports published.

BASF's Nano-in-Vivo Long Term Effect Project partnered with the German Federal Institutes of the Environment and Occupational Health and Safety. The results of this partnership will be

provided to the OECD. BASF's nano-toxicology expertise is often requested by organisations including the OECD, ECHA, the EU Commission and member states.

Contractor forum

Celanese

Building on a decade of company-wide in-house efforts to reach zero injuries in 2014 Celanese's Frankfurt site decided to start a forum with 12 contractor companies. Initial meetings with individual contractors faltered because the format was perceived paternalistic. Spotting the flaw Celanese bought the 12 together and in the spirit of 'trust and openness' revealed past site errors and shared all incident lessons across Celanese sites. The candour worked and the monthly forum meetings morphed into free flowing, lively, information exchanges 'around incidents and near misses' and all new EHS-related activities.

A Contractor Safety Day - held in December 2014 - included contractor company leaders and featured presentations, discussions and recognition. Celanese believes that focusing on explaining the issues it is struggling with rather than highlighting successes unlocked the forum's potential. An indication of the success of this mutual effort is the 2 million injury-free contractor-working hours notched-up at the site since March 2012.

UK shares RC Peer Review Experience with China

Chemical Industries Association

The CIA's novel peer review process has amassed five years' worth of information and key data since its 2010 launch in the UK. The process is applicable to all industry sub-sectors, has a simple scoring mechanism and nil costs enabling association member companies to see good practices in action and to share and learn from EHS peers. It is an alternative Responsible Care implementation verification method, aimed at helping poorer performers to improve and raising national standards overall. Peer review is expected to deliver a 'new vision' for Responsible Care in Britain and interest in other regions is growing.

At Responsible Care Leadership Group meetings (2012-14), the Association of International Chemical Manufacturers (AICM) - representing foreign-owned sites in China - heard about peer reviews. At the April 2015 Leadership meeting, the AICM announced its intention to follow suit and invited the CIA to share its experience. During a week in June 2015, an initial training and workshop day was held in Shanghai followed by visits to three sites and a final day review. The first day was attended by 25 delegates, 14 EHS peers took part in the three trial site reviews and 11 companies - 1/6 of the AICM membership - took part. A sterling start for this example of bilateral cooperation between two trade associations.

EcoTrian - Protecting the most precious: our future

Clariant Produkte (Deutschland) GmbH

Clariant's flagship EcoTrain® label, .initially designed by its Industrial and Consumer Specialties business unit in 2013, is awarded to products in the company's portfolio qualifying as best in class on the basis of 36 criteria. Products in its portfolio are examined throughout their entire life cycle, tested in terms of just how sustainable they really are and how they compare to similar products on the market. And the criteria assesses safe use of products, their contribution to global trends, environmental impact, raw material sourcing, integrated business models and performance advantages.

More information about Responsible Care Awards 2015 : www.cefic.org/RCAwards2015

Over 40 products earning the EcoTrain label showcased at the April 2015 European Coatings Show and Clariant is proactively flying the flag for the label both internally and externally. Via global roadshows, fairs, media roundtables and customer events in Germany, China and Turkey it is publicising which of its products exceed market sustainability standards and are best in class.

SolvayLAB (Local Advisory Board): this is how the Spinetta Solvay plant "talks" with its local community

Solvay Specialty Polymers

With the primary aim of creating concrete opportunities to communicate directly and openly with the local community, Solvay's Spinetta plant launched the pilot SolvayLAB project in July 2014. Sidestepping trade associations, unions, the media, local authorities and institutions, SolvayLAB reached out to people usually excluded from company communications including shopkeepers, family doctors, farmers, religious representatives, retirees and security forces.

The plan involved the provision of information - about plant and environmental safety regulations, aquifer and ground reclamation, industrial strategies and remediation strategies - followed by open discussions with top management. An external facilitator (a sociologist and community psychologist) presides over meetings and an internal coordinator prepares the meeting calendar, agenda and reports and updates a dedicated page in the plant website. Following four meetings, each of which were attended by an average of 30 participants, the fifth (scheduled for July 7, 2015) was scheduled to assess the first years activity, define phase two and launch a Q&A platform on the pant website.

An Introduction to the Solvents Industry training course

Solvents Industry Association

Responding to a knowledge gap amongst new employees, sales personnel, customer services, administrators and other support services, the UK's Solvents Industry Association devised a training course that provides an impartial, basic introduction to the sector and its products. The one-day course - already delivered four times in the UK and once in Brussels since starting in July 2014 - is tailored to people who may not have previous knowledge of chemistry nor the solvents industry. The day covers: the history of solvents; an introduction to petrochemicals and solvents; manufacturing and supply chain; end-uses; SHE issues and transport and packaging systems including legislation and product stewardship.

The five courses delivered so far were attended by over 60 delegates, there is a waiting list and further courses are planned. The day is also open to non-members of the SIA.

DISTRIBUTION CATEGORY

Safe and Sustainable Packaging for organic peroxides

AkzoNobel Polymer Chemistry

The search for an alternative to traditional stainless steel intermediate bulk containers (IBCs) began back in 2008 as AkzoNobel's organic peroxides business targeted improvements in packaging safety, flexibility, costs and sustainability. .Driven by their interest in developing 'single trip' deliveries in IBCs to customers, a team composed of technology, safety, regulatory

affairs and sales/customers services investigated using standard composite IBCs (ie using a plastic inner container in a steel frame). Global composite IBC suppliers guarantee a free recollect service from the customer and fully recycle the returns.

Large-scale tests of the suitability of composite IBC for transporting solvent and emulsion-based organic peroxide formulations were undertaken in 900 litre containers. The collaboration between AkzoNobel and composite IBC producers led to the development of a special venting cover and its use in organic peroxide transport successfully patented. The new packaging - introduced over 2012-2015 - also appears to be suitable for the transport of high concentration organic peroxide formulations. AkzoNobel has recently developed a universal lid that fits all types of composite IBCs that may potentially be installed with a special adapter for product circulation and/or vapour return to prevent vapour emissions.

Safe and secure supply of acrylonitrile, sodium cyanide and acetonitrile

DSM Acrylonitrile

DSM's Acrylonitrile product team developed a comprehensive customer and logistic service provider focused programme to ensure the safe and secure supply of acrylonitrile and co-products acetonitrile and sodium cyanide to its bulk customers in Europe. Formally adopted in 2013 as the Demand & Supply Chain Management Policy, since then all key employees - including supply chain engineers, sales and business managers - have been policy trained.

The policy has led to tangible improvements at customer sites. Examples include an upgrade and expansion of a storage tank; harmonisation of breathing protection at a customers' multiple sites; assisting a customer in the configuration of the unloading station and storage tank. The team has summarised its policy in a video, available from mid-2015, and plans to continue auditing customers, reviewing regulatory standards and market developments to seek ways to continue to improve safety standards.

Supply Chain/Distribution Risk Mitigation Program

LyondellBasell - Lyondell Chemie Nederland B.V.

LyondellBasell's new Operational Excellence Product Stewardship standard was introduced in 2011, setting down evaluation and product risk management practices. Since then 53 European customer sites have been visited and assessed. Improvements at their sites include: the installation of a safety shower in the unloading area and of a close loop sample system to prevent operator exposure; use of proper personal protective equipment (breathing protection during connecting/disconnecting unloading hose or arm) and installation of a grounding system to prevent the build-up of static electricity during unloading.

With all existing customers visited by end-2015, the next phase, beginning in 2016, will involve a second cycle of customer re-assessment visits.

Reduction of transports through double-deck loading

Schülke & Mayr GmbH, Norderstedt

Responding to German road congestion and the forecast 30% increase in goods traffic by 2030 Schülke & Mayr set itself the task of finding a transport solution. Thinking that even small steps can help the company also aimed to avoid unnecessary journeys and reduce environmental impact in its 60km round trip from the Norderstedt site to the Hamburg-Wilhelmsburg hub. A

tricky balancing act, as customers need to reduce inventories and simultaneously demand more and swifter deliveries. The challenge is compounded because the company carries hazardous cargoes that are not allowed to travel under the River Elbe tunnel and have to route through Hamburg's urban areas.

The solution it hit upon is simplicity itself. The company introduced double-deck loading in its lorries. On the upside, by using this method the number of pallets-per-lorry increased from 2005's average 30 -34 to 50-(and a maximum of 63) in 2015. Despite higher volumes, daily shuttles have been limited to six trailers, before it would have required 10-12 trailers. Diesel fuel savings through the double-decker solution are >26,250 litres-a-year. On the downside, not all pallets are suitable for double-deck loading; double-deck loadings take twice the time 'usual' loadings.

Dedicated to Safe Carriage

Taminco BVBA, an Eastman Chemical Company subsidiary

Taminco's methylamines and salts business unit launched a global safety promotional campaign, including a user-friendly instruction manual for the safe unloading of methylamines in gas tanks, in January 2014. Distributed globally the aim is to highlight safety awareness both within and outside company gates. Together with the manuals , customers receive a gas tank shaped USB stick containing a video showing step-by-step unloading procedures plus coffee mugs printed with Taminco's 'Dedicated to Safe Carriage' slogan.

The company's internal loading team is on call to help global customers use its instructions to ensure the safe gas tank unloading and return. Taminco holds an annual global contest aimed at recognising employees demonstrating outstanding best practises in sustainability related projects. The three award categories are Sustainable Innovation, Responsible Care and People & Society.

*Optimization of transport safety for hazardous goods - **Category Winner***

TOTAL Bitumen Deutschland GmbH

Aiming to recognise and reward liquid bitumen drivers for exemplary behaviour in safely transporting dangerous goods from delivery facility to customers, TOTAL Bitumen started a safety competition in 2013. This initiative was recognised by the jury and therefore awarded distribution category winner 2015. Drivers are evaluated and awarded points throughout the year and the top five drivers - with the best safety performances - win voucher prizes, with a total value of around €2,000. Another award is given to the best total performance by a bitumen haulier's drivers.

The drivers voluntarily collect bonus points by answering questionnaires on safety; safe filling at loading/unloading facilities; meeting truck safety controls on site; employing dangerous goods controls without deviations and completing incident reports. TOTAL provides monthly feedback of the top 10 drivers and grants small awards to stimulate motivation. The response from drivers has been positive and 2015 marks the third year of the competition. TOTAL plans to translate the documents used and involve drivers from other countries.

ENERGY EFFICIENCY/SPICE^3 CATEGORY

Celanese energy cockpit

More information about Responsible Care Awards 2015 : www.cefic.org/RCAwards2015

Celanese

Even though Celanese's Frankfurt site received ISO 50001 certification in 2013, because of the high degree of complexity, site personnel still found it difficult to track energy performance and spot improvement opportunities. To address this - and hit the parent company goal of reducing energy intensity by a further 20% by 2015 from 2010's baseline - the Frankfurt Energy Team and Celanese's Global Energy Team devised a solution.

The centrepiece is a combination of thorough data analysis (based on Six Sigma methods) and a comprehensive online monitoring tool - the Energy Cockpit -that displays four energy speedometers and compares actual consumption to targets that include uncontrollable factors. Here uncontrollable factors include market demand and weather conditions that determine throughput and product mix (controllable factors are not included in the mix). The four speedometer levels show: overall plant energy consumption; the efficiency of 'subordinated' units; specific consumption for individual energy using units. And the fourth level allows operators to see what causes a deviation in energy efficiency.

The Energy Cockpit is used in Frankfurt on a daily basis. Operators use it for online plant performance energy intensity monitoring. Shift supervisors report on energy intensity performance at daily morning meetings that works as an early alert to deviations from optimal performance. Since its roll out energy savings of up to 20% have been achieved. And since 2013, the POM plant - producing the high performance polymer Hostaform - reduced energy intensity by over 10%, equivalent to an energy saving of 150,000 GJ or 40,000 MWh.

Online monitoring of Energy Efficiency on equipment level in a chemical plant

Clariant Produkte (Deutschland) GmbH

The triple goal of Clariant's Online Monitoring project was to develop a standardised management and benchmarking system that would reduce energy demand by over 10%, be applicable globally and over all processes. Using real time data - available in the process management systems PIMS - plant structure is represented by a hierarchical tree covering all process steps. A sheet is implemented for each process step showing both the current status of energy consumption and the development over the last hours. A best and worse demonstrated practice value is used to benchmark the current status into "green", "yellow" or "red" and the status of the whole plant illustrated by a coloured graphical tree. This simplified colour-coded tree, provides an overview of plant energy status. So if the trees root is "green" there is no need to act, but if it is "yellow" or "red" the operator is alerted to discover 'bad actors' by navigating the tree structure.

The energy monitoring system enables operators to spot unusual high energy consumption, to make a root cause analysis and to define actions needed to reduce it. The best and worse specific energy values are reviewed each year to ensure continuous improvement. The pilot plant testing the system consisted of two in parallel running production lines and its steam production and reactor catalyst performance included in benchmarking analysis.

Within two years of implementing the project, steam consumption was cut by >15,000 tons (or 3,000 less $C0_2$ emissions) and overall savings of €500,000 achieved. Next step plans are to roll the system to other Clariant production plants and to check its application in batch processes.

Low Carbon Footprint Strategy & Energy Management at Dow Corning Europe SA

Dow Corning Europe SA

Dow Corning's Seneffe plant in Belgium combines the production of sealants, compounds and emulsions with new materials R&D. The plant has cut $C0_2$ emissions by 41% between 2000 and 2013 as part of the first generation of industry-wide energy efficiency agreements. This was achieved by a variety of actions ranging from improvements in roof insulation, using river ways to transport materials between Seneffe and its Barry plant in Wales, and investments in a gas fired cogeneration unit, a wind turbine, a geothermal heating installation and most recently solar panels.

The cogeneration unit replaced less efficient boilers, accounting for about 50% of the site's annual heating and 15% of its electricity needs. This 2009 investment delivered significant cost savings and reduced $C0_2$ emissions by 400 tons-a-year. Its investments in renewable energy began in 2011 with the installation of a 2.3 MW wind turbine that supplies 20% of the site's electrical demand saving c 2,000 tons of $C0_2$ annually versus importing grid electricity. In 2012, the site installed 10, 120m-deep, wells and this geothermal heating installation heats and cools the Silicone Technology Center. The efficiency of this geothermal system is above 100% and it typically generates 3-4 times more energy than it uses.

In 2014, 3,200m^3 of solar panels - with a peak generation capacity of 500 kWc were installed on the roof of one of Seneffe's manufacturing plant building and at the company's European Distribution Center in Feluy, Belgium. These panels are expected to produce around one percent of Seneffe's total electricity consumption and 10% of Feluy's, leading to $C0_2$ savings of about 80 ton-a-year.

LyondellBasell Tarragona site step-change in energy use

LyondellBasell - Basell Poliolefinas Iberica S.L.

The Tarragona sites internal policy to enhance energy efficiency coupled with changing external circumstances triggered an opportunity to explore alternative energy supply and minimise energy use. The project started in 2013, embraced replacements of an extruder, a boiler, cooling water towers and air compressors, replacing steam use by a hot-oil system and moving demi-water supply to an external provider. Combined, these actions have resulted in a permanent energy saving of >nine GWh and a payback time less than a year. In December 2014, an ISO-500001 Energy Management certification was granted by TUV.

During 2016, old lighting will be replaced with LED's, options for its power supply are being investigated, and a solar energy feasibility study is in progress.

Heat Recovery in chilled water plant

Merck Millipore

As part of the parent company's goal to reduce $C0_2$ emissions by 20% by 2020 staff at Merck Millipore's Molsheim site, Germany came up with a neat plan of turning cold into heat previously generated by natural gas boilers. In a chilled water production process, chillers are rejecting heat. This heat is usually not recovered but could be used if there is a simultaneous

need for both chilled and hot water in the process - for example as dehumidification of clean room air.

Tapping into this potential a new chiller with a specific feature enabling production of hot water (55^0C) was installed at Molsheim. Heat captured in chilled water loop is injected in a hot water loop connected to the same chiller so producing hot water in parallel. Hot water is routed to the boiler room replacing boiler generated hot water. This project has resulted in an 84% reduction in gas consumption in the site's cleanroom building and it contributed 11% of the 35% reduction in $C0_2$ emissions achieved site-wide between 2006 and 2014. Energy meters continuously monitor the systems' efficiency.

Ozone depleting substances ban, major enabler for energy efficiency
Solutia Europe BVBA, a subsidiary of Eastman Chemical Company
The landmark 1987 international agreement designed to protect the stratospheric ozone layer - the Montreal Protocol on Substances that Deplete the Ozone Layer - has been continuously and significantly amended. The Ghent Saflex® plant had a hand full of completed projects under its belt by 2012 that eliminated the ozone depleting refrigerant HCFC-22 from some of its facilities. In 2012, then new parent Eastman took the opportunity of the ozone ban to challenge Ghent to launch a projects cluster to eliminate any remaining ozone banned refrigerants -meeting the Protocol's January 1 2015 deadline - whilst also cutting energy demand.

The challenge involved >50 different cooling compressors plant-wide, some small, some large, direct and indirect, water and air-cooled chiller systems. The projects took 18 months - from Q2 2013 when the main piping collectors were installed to Q4 2014 when all remaining banned refrigerant cooling systems had been removed. - either swapped, altered, reconverted or built new. Electrical energy demand was cut by 3,000 MWh/year - five-times more than the targeted 600 MWh/year and equivalent to 25% of the total low temperature cooling energy use. These savings were accomplished in the chilled glycol-water generation and distribution areas. Ghent's 2015-2016 objective is to optimise chill utility even further.

*Energy Efficiency improvement through steam re-compression - **Category & Special Commendation Winner***
Trinseo Benelux BV
Jurors picked Trinseo as the Energy Efficiency/Spice^3 Category winner and in the overall winners discussions awarded the project a Special Commendation. Further details are available in the Winners leaflet.

ENVIRONMENT CATEGORY

sunliquid
Clariant Produkte (Deutschland) GmbH
Turning non-edible agricultural residues - not used as either food or feed - into biofuels has rarely been an option as the stable structure of lignocellulosic material is tough to break down by conventional methods. Step forward Clariant with its sunliquid® process to convert previously unusable residues - like cereal straw, corn stover or bagasse - 'almost completely' into high-quality ethanol. It is a several step process covering: after a chemical-free mechanical

and thermal feedstock pre-treatment with pressurised steam, the cellulose and hemicellulose chains are converted by optimised feedstock and process specific enzymes into sugar molecules. The sugars are fermented using specially developed fermentation organisms to ethanol in a one-pot reaction that results in a 50% higher yield. The entire energy for the process comes from the residues.

Since July 2012 Clariant's pre-commercial 1,000 tons-a-year unit in Straubing, Germany was converting about 4,500 tons of lignocellulosic feedstock annually. In 2014 Clariant, Haltermann and Mercedes-Benz conducted a fleet test to evaluate the efficiency of sunliquid®20 - a premium grade petrol containing 20% cellulosic ethanol produced at Straubing. The fuel improved engine efficiency and particle emissions were reduced by 50% compared to the EU reference fuel E5. Clariant has developed a blueprint for a 50-150kt (20-60 million gallons) ethanol plant.

Clariant believes that compared to fossil fuels, sunliquid® cellulosic ethanol saves around 95% greenhouse gas emissions. Collection of up to 60% of European residual straw could potentially be processed into 27 million tons of cellulosic ethanol - equivalent to the energy content of 18 million tons of fossil-based petrol and 25% of the EU's forecast 2020 gasoline demand.

Don't waste water - not even waste water

CG Chemikalien GmbH & Co KG

As an 80m^3-a-day water consumer, almost a third of it wastewater (c 25m^3), CG Chemikalien set itself the challenge to build a neutralisation system in order to recycle and reuse a targeted 90% of wastewater. The project is complicated by the diversity of wastewater produced - not only containing salts but also non-solubles like limewater and iron plus organic and volatile compounds such as formic acid. The process CG Chemikalien has opted for treats waste water in four steps - solid content separation, neutralisation/detoxification, vaporisation and flocculation with filtration.

A two-week trial run with a test model was completed in June 2015, six months on from the decision to install the system. It demonstrated that most of the wastewater is reusable. The system is scheduled to be installed in September 2015, initial operation set for November 2015 and attaining the goal of 90% waste water reuse by January 2016. Success will also mean that overall water consumption is cut by close to 50%.

RECYCLING! Domestic Packaging

Dow Chemical Ibérica S.L.

Bringing housekeeping into the Tarragona complex, Spain Dow Chemical Ibérica tackled a formerly perceived minor residue issue - the cans, plastic cups and bottles discarded by close on 600 plant employees that had previously been landfilled. Following a pilot programme (December 2012 to January 2013) the project was scaled up to all the plant's facilities. In the first year of running (March 2013-March 2014), the 'domestic' waste collected and recycled included: 638,812 cups; 107,175 litres of random packaging (yogurt, food cans, PET bottles etc) and 20,800 beverage cans.

The domestic packaging waste generated during the initial year would fill 45, 6m^3 containers, all of which is now recycled. Dow considers the project to have a triple benefit: it promotes

Responsible Care principles to raise awareness of recycling; the environment benefits by reducing material sent to landfill and $C0_2$ emissions are reduced.

DSM Dalry Sustainability Program - ***Category & Top 3 Winner***

DSM Nutritional Products UK Ltd (Scotland)

Jurors picked this entry as the Environment Category winner and in the overall winners discussions it was recognised as a top 3 entry. Further details are available in the Winners leaflet

AMINOFootprint® 2.0

Evonik Industries AG

Evonik's Nutritional & Care business provides all amino acids essential to animal nutrition. Its AMINOFootprint® 2.0 is a web-based app for notebooks and tablets that enables users to calculate ecological profiles of compound feed and display diets with the least environmental impact. It adds a third dimension to what feed additive companies promise to deliver alongside nutritional and economic aspects of compound feed. The database consists of certified feed ingredients from the world's main production regions. It supports customers to understand the concept of the ecological burden of locally produced specific diets and enables the user to create new diets based on existing feed ingredients and transport scenarios.

Containing a range of representative diets, for example pig and poultry diets are displayed with respective feed ingredients and their inclusion rates. Based on an interactive world map, next to the physical distance of a transport scenario, users can select different types of transportation (deep/short sea, bulk truck or railway shipment) and see emission rates specific to the type of transport.

Earth Day locality clean-up of the entire site

IBEC Members

Nine companies - members of PharmaChemical Ireland (PCI) and the Irish Business and Employers Confederation (IBEC) - agreed to clean up the area around the villages of Ringaskiddy and Shanbally and the Port of Cork to clear it of any waste that may have an adverse effect on wildlife and habitats. Co-ordinated around Earth Day April 22, 2015 clean-up areas were assigned to each company whose personnel spent two hours to complete their part of the task.

The teams collected over two full truckloads of waste, which were delivered to the local authority waste facility. Participating companies were PCI members: Biomarin, Glaxo SmithKline, Hovione, Janssen, Novartis, Pfizer and Recordati; plus IBEC members: Moog and De Puy. Promoting water safety, the group are now working on replacing all lifebuoys on local beaches in conjunction with the local authority.

Flare Gas Recovery Project

LyondellBasell - Basell Polyolefine GmbH (Wesseling site, Germany)

The Wesseling complex is LyondellBasel's largest European facility and Phase 1 of its aim to reduce flare gas emissions dates back to 2005's commissioning of a compression and recovery unit. The resultant annual 45kt reduction in $C0_2$ emissions spurred the utility engineers and

power plant operators' team to improve further and by 2008-09 reductions reached 65kt-a-year.

Work on Phase 11 began in 2010, focusing on the conceptual design of a flare gas recovery units' requirements to secure more stable boiler operation. In-house engineers with the assistance of Aachen Technical University made an important technical innovation - the introduction of a 'multi-pipe gas mixer' which 'smooths out' flare gas composition fluctuations so providing a more consistent boiler pre-feed fuel. Phase 11 plant start-up began in December 2013 and during its first year of operation and optimising additional greenhouse emission savings hit 70kt (2014 $C0_2$ savings reached 135kt based on 2005's baseline). In addition, the project replaced 30kt-worth of heavier boiler fuels with waste natural gas-a-year. Project payback will be under three years.

*Eliminating Drug Residues from Water -LaciK -**Special Commendation Winner***

Merck KGaA - Merck Millilpore

The jury thought this project potentially tremendously significant and therefore nominated it for a Special Commendation. Further details can be found in the winners leaflet.

Elimination of Arsenic from Groundwater

Merck KGaA - site operations

In an agreement with the State of Hesse, Merck committed to remove arsenic contaminants originating from coal and slag stored on the Darmstadt site and washed into groundwater by rain. Preliminary filtration techniques and adsorbent tests were conducted in a pilot plant with laboratory scale wastewater and upgraded to an industrial scale a year later in 2012. Within six months, 18,000 m^3 of groundwater had been treated with elimination rates of 80-90%. As the planned site for the pre-treatment plant did not have enough water for backwashing static filters, the treatment plant was designed to handle 200-250 m^3-a-day of arsenic groundwater.

Commissioning of the pre-treatment plant began in 2014. To start the system the first filter stage was filled with sand and the second stage with adsorber. The team hit cost and operational safety snags in their attempts to use adsorbents so instead used lower sand particle size in the second filter unit, which increased elimination capacity to 94%.

The elimination of arsenic from wastewater is based on four different effects. These include: adding lime at the neutralisation part as calcium arsenate; passing the wastewater into a buffer and equalization tank where there are anaerobic zones (as in the downstream biological treatment stage); at the biological treatment stage iron chloride sulphate is added to the phosphate surplus; with phosphate deficiency in the aeration tank, arsenate is accumulated as a substitute of the biomass. .Using the process elimination rates nearly touched 99.5%

Label of Responsible Use

PINK FROGS SRL

Pink Frogs formulates and produces cosmetics, exclusively for third parties, at its Rozzano (Milan), Italy site. Its production portfolio - developed over 35 years - spans cleansing preparations, skin and hair care, toiletries and fragrances. Through Certiquality, this 35 site employee-strong company is certified according to ISO 9001, 222716 and 14001. Supporting its

customers 'green philosophy' orientation, Pink Frogs produces products based on the 'most sustainable' processes, natural ingredients and actives.

Pink Frogs' initiative is to raise awareness amongst end-use consumers to the role they can proactively play in the use and end-of-life disposal of the cosmetic products they buy. The responsible consumer would, for example: use a bicycle or walk to purchase their cosmetics; apply only the quantity of product instructed on the label; use just a suitable amount of water to rinse and recycle completely according to indications. The company's investigation into an irresponsible example of use and disposal indicates that, for an application of 1.5g of product, $C0_2$ equivalent emissions would increase by 113%, water consumption by 4% and impact on the aquatic rise by 800%. Put simply, individual responsible care can make a difference.

LIFE + GLEE Project (Green Li-ion batteries through Electrode Electroless deposition)

Solvay Speciality Polymers SpA - part of Solvay Group

This project set out with the objective of eliminating the toxic solvent NMP (*N*-Methyl-2-pyrrolidone) - historically used in the manufacture of rechargeable Li-ion battery components (like Cathode Active Materials, CAM) - with an alternative technology using water-based green binders. The alternative does not carry toxic risks, avoids solvent recovery and re-purification costs and critically it responds to European regulatory demands for NMP substitute products.

Furthermore, the Solvay team aims to prove that the new Li-ion batteries, created using innovative proprietary Electroless Cathode Coating Technology (ECCT) and a sustainable manufacturing process, will outperform the conventional Li-ion batteries manufacturing process. ECCT protects water sensitive CAM, while allowing Lithium ions to penetrate and disperse through the electrode structure (a key feature for battery efficiency).

Production and testing is taking place in a pilot plant built at Solvay Specialty Polymers R&I Centre in Bollate, Milan, Italy. The demonstration pilot plant has been operative since the beginning of Q2 2015. Plant fine-tuning /optimisation and external validation of coated CAM will be completed by end-2015. Evaluations of commercialisation and an environmental impact evaluation are scheduled for Q1 2016.

The European Commission supports LIFE and GLEE via funding from the LIFE financial instrument of the European Community.

Growing insulation - Insulating Facades with Hemp

Synthesa Chemie Ges mbH

Austria's Synthesa Chemie has an alternative to the polystyrene (EPS) and mineral wool exterior wall insulation materials - known as exterior insulation composite systems (ETICS) - that currently account for the lion's share of the market. Capatect, part of Synthesa, has developed an insulation material made of hemp to replace petroleum-based materials.

A Life Cycle Assessment of hemp insulation indicates savings of up to 10 t of $C0_2$ compared to EPS-F and up to 15t compared to mineral wool in a detached house. Other properties of hemp insulation include their 'exceptional' noise protection and high resistance to elements such as hail. Development of basic products and processes began at Capatect in 2010 when several patents were issued. Production began in 2012 and European certification and product roll out in Austria completed in 2013. Roll out in Germany and other European markets began in 2015.

More information about Responsible Care Awards 2015 : www.cefic.org/RCAwards2015

"ZERO PELLET LOSS"

TOTAL Petrochemicals Feluy

Feluy plant personnel spotted a downside during the bulk loading of plastic pellets into trucks. Some pellets miss the trucks' roof manholes, staying on the roof or falling to the ground creating environmental problems both outside the factory gates and within. The logistics department developed and built a tunnel system for loaded trucks that blows all the granules that may be on the roof off the truck before it leaves the plant.

Operational since mid-2014, the system has delivered 'a real improvement for the environment' both in safety and corporate image. The concept is simple and easily applicable to all sites where plastic pellets are bulk loaded.

3 Barrier concept for protecting the waste water treatments

TOTAL Raffinerie Mitteldeutschland GmbH

Basic on-site research about operating biological wastewater treatment under various scenarios stretches back to 2005 at TOTAL's Leuna refinery, Germany. The site is also Germany's largest methanol producer. Detailed studies to increase wastewater treatment in turnarounds were undertaken at a university pilot plant during 2007. Fast forward and in 2013 external respiration tests for possible contaminants were done at university level.

TOTAL recognised that toxic contaminants could affect biological activity in wastewater activity. The solution it developed to protect the wastewater treatment is the 3 barrier concept. The first barrier: offline toxicity measurement - testing wastewater streams directly on source prior release. The second barrier: online toxicity measurement - continuous monitoring of feed streams to the biological stage. The third barrier: turnaround-related operation mode of wastewater plant with major focus on availability. The concept has been in operation since 2014.

The benefits of the concept include prevention of environmental incidents; high availability, flexibility and within specification wastewater treatment, lower costs.

OCCUPATIONAL HEALTH & SAFETY

Safety always in mind

Arkema

The genesis of Arkema's group safety programme - SAFETY ALWAYS IN MIND - happened in 2005 when it was spun off from TOTAL. Addressing the causes of accidents and incidents during its short history, in 2011 it rolled out an updated safety programme - ESSENTIALS - that set 14 clear rules running from road traffic, alcohol and drugs, plant operations to cell phones.

A busy period of divestitures and acquisitions led the global leadership team to re-evaluate its approach to safety during its December 2012 meeting. The idea of the Safety Academy was born with the intent of creating .a common thread in all safety training efforts on three levels - top management, intermediate management and shop floor. The first module for the Arkema

Safety Academy - using ROOT Inc graphic imagery - started development in 2014. All 14,000 employees will receive the kits - translated in 10 languages - during 2015. Plans to modify the kit are in progress so Arkema can share its safety culture with its new 5,000 Bostik colleagues.

Behaviour Based Safety (BBS) Project
Bayer CropScience - Marle Site

Beyond reducing incidents and injuries, the Behaviour-Based Safety (BBS) project at Bayer CropScience's Marle, France packaging/filling plant aims to embed a culture of positive and proactive safety at work and in all aspects of employees daily lives. To accomplish this, the project -running from September 2014 to end-2015, is using both traditional methods and digital ones.

The initial safety culture assessment involved a 10-minute survey, the results of which were analysed externally and ensured anonymity, followed-up by a three-day period of interviews and observations and culminating in a 90-minute presentation of results. This first step identifies established good practices and indicates the level for measuring progress. Management then attended a 2-day leadership meeting and an observer team 1.5 days of basic training. The safety leadership programme includes elements such as clarifying safety expectations and points to work regular feedback and positive reinforcement plus weekly debriefing to share examples and refine coaching skills through peer exchange.

A BBS mobile phone app has been develop to aid the 20-30% of operational employees trained to observe behaviours. Making an observation - on one of three chosen situations -should take no longer than a minute. A web app - dedicated to the results of observations and their indications -has been developed to provide weekly insights into behaviours.

The set-up of a sustainable health and wellness programme during the start-up phase at Biomarin
Biomarin International Ltd
Biomarin decided to launch its Health and Wellness Team in tandem with the start-up phase of a previously dormant site it acquired from Pfizer in Ringaskiddy, Ireland. The main objective of the project is to promote and maintain the physical, mental and social well-being of all Biomarin personnel. Not just confined to occupational health and well-being, it took a holistic approach with the motto 'Live Well, Work Well'. Involving the local community and neighbouring workplaces in events was another aim.

The project was approved in Q3 2014 and its early September launch attended by 120 people (all personnel and contractors were invited). Between then and now a lot has happened -over 20 activities covering a wide variety events and topics. From Pilates classes and a couch to 5k running programme, to talks on carbon monoxide, mental health, nutrition and workplace safety plus a Family Fun Day (attended by 300 people) and Health Promotion month. October has been designated Breast Cancer month and a talk on male health issues in set for November. A site survey is being conducted in September to canvass ideas for 2016's activities and talks.

Goal Zero Journey of Grand-Quevilly

Borealis AG

Borealis acquired GPN SA, France's largest nitrogen fertiliser producer, in July 2013. The "Goal 0 journey Grand-Quevilly" project - focusing on one of GPN's three French production sites - aimed to deliver improvements in safety and processes, to sustain the improvements achieved in regulatory and environment, fulfil HSE requirements and set Borealis Responsible Care standards. The Goal 0 programme also facilitated HSE improvements in managing turnarounds and in its "0 leakage programme".

The transformational project involved training all employees in implementing the new safety culture, in safe working and best practices. Comparing 2013's HSE performance with that of 2014, improvements were made on every level including safety (which logged 0 turnaround injuries), environment and regulation. Grand Quevilly received Borealis's HSE award for the innovative Goal 0 project and for its 'satisfactory' HSE performance (a full year and a turnaround with no accident plus a notable improvement with the authorities). The key success factor for Borealis was the ability to have changed employee mentalities.

KeepSafe Certification

Celanese

Celanese's journey to zero injuries dates back a decade and in that time the company learned that the first line leaders are the key to moving things forward. Late 2013 it started a global project for Line Leader development. Line leaders are typically shopfloor employees, often shift leaders or foremen. The first German sites selected for line leaders were announced in Q4 2013 and Keepsafe certification workshops started.

The Keepsafe certification is composed of five individual modules plus four shared ones. Through these modules, line leaders are advised how to: keep workers safe and healthy, understand how to influence employee behaviour and how to approach employees who are working in a safe and healthy way and provide feedback in case of unsafe or unhealthy practices. The modules are delivered as active workshops supported by post-workshop activities to ensure the content is not only understood but also applied.

During Q4 2014, a one-week workshop broaden the geographical scope with representatives from the Netherlands, Belgium and Sweden and Germany's Oberhausen site. KeepSafe certification of 11 Frankfurt and eight Kaiserlautern line leaders had been completed by Q2 2015. And by end 2015, certification of additional 40 Frankfurt and 10 Oberhausen line leaders is planned. Other European sites will begin the ongoing certification project in 2016.

GOOD MORNING - GOOD TOMORROW (GM-GT) ***Category & Top 3 Winner***

Social partners of the Finnish Chemical Industry

Jurors picked this entry as the Occupational Health & Safety Category winner and in the overall winners discussions it was recognised as a top 3 entry. Further details are available in the Winners leaflet

Crossborder Contractor Management Team (SMAT)

Dow Deutschland Ges.m.b.H., Dow France & Dow Agrosciences

Dow's Rheinmünster site in Germany formed a Supplier Management Action Team (SMAT) to improve contractor safety performance and lift standards to Dow's expectations in 2001.

More information about Responsible Care Awards 2015 : www.cefic.org/RCAwards2015

Collaboration with Dow's site - across the River Rhine - in France began in 2005. Over the years, in recognition of the link between safety and service, quality management has been added to contractor criteria.

The Rhine Valley Hub SMAT formed in 2013 to reflect the acquisition of Rohm&Haas's Lauterbourgh, France site and its integration into Dow. A joint contractor standard for all three sites - Rheinmünster, Drusenheim and Lauterbourgh - was established. By using a set of agreed standards to qualify contractors, thereby harmonising contractor standards between the two countries, contractors can work crossborder. Distance prevents common labour contracts but the company is exploring opportunities to leverage knowledge, standards and experiences between the Rhine Valley Hub and the Chauny and Villers Saint-Paul sites, in Picardie, France.

A Win-Win Challenge

ExxonMobil Chemical France

Each year ExxonMobil awards best safety record trophies to 10 contracted companies working at its largest integrated Europe platform at Notre-Dame-de-Gravenchon, France. In October 2013, it invited students of the Pierre de Coubertin high school to design 2014's Gold Tiger Award. The project, spanning 14 months over two school years, involved 20 students (working in pairs) and six teachers (covering subjects like plastics arts, IT and metallurgy).

Starting from scratch, the students created on paper designs of which five - based on their technical feasibility, symbolism and originality- became models using a 3D printer. Presentations to ExxonMobil reduced the contenders to three, with elements of each combined to arrive at the final design - a person in the centre of the Loss Prevention System pyramid within an industrial background.

The students made all 14 awards ceremony trophies employing their skills in drilling, machining, bending and using a plasma beam. All students attended the awards ceremony alongside over 400 employees, contractors and government officials. Their project is now an exhibition at the local skills centre - June to December 2015 - designed to attract people to enter the metalwork and machining professions.

Healthy Workplace - Manage Stress

Genzyme, a Sanofi Company

Sanofi acquired the 2001 established biopharmaceutical campus of Genzyme Waterford, Ireland in 2011. Subsequent diversification, growth, product introductions and a leaner environment triggered workplace stress. Occupational health cases, absences and calls to the Employee Assistance Programme all rose. In a 2011 survey just 55% of staff agreed with the statement that the site was a 'psychologically and emotionally health place to work' by 2014 that figure had risen to 75%.

Responding to the issue, a steering group secured management support and identified a pilot group with high levels of identified stress. One-on-one (40 minutes) and focus group (120 minutes) interviews examined root causes. Colleagues in the pilot group were provided with

one-day resilience training. The course, designed for adult learners, highlights the main sources of personal stress, practical ways of dealing with them and ways to be personally resilient.

Over the programme's first year stress cases presented to the occupational health team fell by 30%. Almost 90% of participants said they benefitted from the programme, 70% would recommend the training and 63% they could now cope better with a stressful scenario. Great Place to Work Ireland named Genzyme Waterford among the top 10 workplaces in 2013, 2014 and in 2015 the site topped the rankings.

Health & Wellbeing- Essential Life Skills and Emergency Response
Leo Pharma
Following the loss of a colleague, who suffered a fatal on-site heart attack (December 2014) despite immediate cardiopulmonary resuscitation (CPR) and a first AED (automated external defibrillator) within three minutes of his collapse, staff at Leo Pharma's Dublin facility requested voluntary training to be able to aid someone experiencing a cardiac arrest. Management responded and to-date 164 employees (almost 40% of the workforce) have received training -of 3.5 to 4 hours - that mirrors the best international standards for Cardiac First Responder (CFR).

The company also doubled the size and strength of its Emergency Response Team to 30 people and increased personnel training to provide comprehensive 24/7 emergency cover on-site. The training course has fostered teamwork, encouraged voluntary participation and helped people become more proactive.

***Lifebeats**, our next step in our GoalZERO journey*
Lyondell Chemie Nederland B.V.
Lifebeats is LyondellBasell's global intranet portal, off-the-job initiative aimed at empowering employees and their families to make positive lifestyle decisions, so creating a workforce with a 24/7 culture of safety and wellness. No one can control their age or genes, but Lifebeats identifies the risk factors people can control - ie nutrition, exercise, smoking, stress, alcohol and drugs, infectious diseases and safety. Based on studies of worldwide data trends, the in-house developed programme focused on key controllable risk factors including, chronic and infectious diseases, musculoskeletal systems and exercise, mental health, smoking/alcohol/substance abuse and off-the-job injury/home safety.

Begun in January 2014 **Lifebeats** was promoted through the company's main intranet page, references in internal videos, at regional/site management meetings. Continuous improvements are happening, during 2015 fine-tunes like simplification of monthly topics, adding email and local links were introduced. A college intern is assisting with content development/publication and the internal communication group is working on further developments.

Full RC system: in line with international standards and materializing in a unique system all company-specific HSEQ key requirements
Solvay SA
To the best of its knowledge the Solvay Care Management System (SCMS) is the most extensive HSE(+Q) company-specific reference tool with clear, structured, tiered requirements - that also

incorporates all international standards - so allowing certification. The aim of creating the system was to define, fully pilot test and start deploying an in-house management system that can be applied by each Solvay site (it operates 132 manufacturing plants) that is compatible with the three international standards ISO9001, ISO14001 and OHSAS 18001.

As a supporting tool, the SCMS was designed to not only improve QHSE at the shop floor level but also reduce the number of external audits. In 2015 the SCMS was defined and tested in 12 pilot sites and potentially applies to all operational sites. Group priority target sites are those that currently have inconsistent or partial management systems - for example have ISO 14001 but no OHSAS system - and sites wanting simpler and clearer synergies between corporate standards and management system.

Safe management of chemicals at the workplace: a global, shopfloor compatible, tiered approach for occupational hygiene

Solvay SA

Compared to accident prevention, industrial hygiene is paid relatively less visible attention, arguably due to the large number of substances, the complexity of exposure assessments, task diversity and the involvement of shop floor non-specialists. Solvay started developing a harmonised exposure assessment tool over 20 years ago, from 2003 it launched a project to manage industrial hygiene data in a dedicated SAP module which is currently used in 50 manufacturing sites.

In 2013 Solvay launched project “Socrates” aimed at redesigning the industrial hygiene SAP module. The project is in the final stage, the first pilots rolled out in July 2015 and all sites will have adopted the module by 2020. Addressing the need for more appropriate data for shop floor workers to assess exposure risk, Solvay developed Critical Task Exposure Screening (CTES) for tier 1 assessments. This solution enables convergence between tier 1 (identification of tasks that may generate a risk) and tier 2 (a detailed risk assessment of a task). During 2014 and the first half of 2015 several CTES .pilots have been launched and >70 sites trained as it is cascaded to the shopfloor. From July 2015 the CTES will be mandatory for all new assessments and by 2020 all assessments moved to CTES.

Stay alive, don't text and drive - serious about driving safety

Univar

Univar runs formal driver training programmes for all personnel driving in the course of their work. Recognising life’s’ many distraction Univar organised a poster competition for children under 16 to highlight the dangers of texting while driving. Prizes were offered for two age groups: under 10 and 10-15 years old. More than 70 posters were submitted and almost 1,400 votes received from employees and alongside an independent judging panel, seven winners chosen.

Alejandro agreed 10 from Barcelona drew a car falling over a cliff edge as the driver ignored the safety sign. He won an iPad and his design made in a poster for display in all Univar sites. In the under 10’s age group another Alejandro aged 8, from Madrid, drew a picture of the right and wrong way to do things. Runners up came from Poland (Julia, aged 12), the UK (Emma, aged 5), France (Kori, aged 9) and Belgium (Toon, aged 5).

Safety: Commitment and Engagement

Versalis S.p.A.

Versalis began its open ended and continuously evolving Safety, Commitment and Engagement programme in 2007 with the creation of a 'One year without injures' safety award. The INDECO database - collecting, managing and disseminating information relating to accidents, injuries, near misses and sub-standard operating conditions - started in 2009. The focus on eradicating near misses and unsafe conditions continued and a systematic analysis of safety levels and equipment reliability was launched in 2011, followed by the introduction of a root cause analysis in 2012 to investigate the causes of incidents and reduce the risk of occurrence.

Tangible progress has been made. Back in 2007, just three of 19 sites had achieved 12 months without injuries for employees; by 2014, 17 out of 18 plants gained that status. For contractors, just one site reported a year without injuries in 2007; by 2014, 12 of 18 sites reported no contractor injuries over the previous year. Work to minimise near misses and unsafe conditions continues.

PROCESS SAFETY

Process Safety Management

Avery Dennison Material Europe GmbH Kreuzlingen

The aim of the Process Safety Management (PSM) programme being implemented at the Kreuzlingen plant, Switzerland - the company's sole European chemical site - is to ensure a safe working environment and sustain Avery Dennison's 'Zero is achievable' target for recordable injuries. PSM, with a special emphasis on the adhesive production unit, is focusing on a proactive and systematic identification, evaluation and prevention of chemical releases that could occur because of failures in process, procedures or equipment.

The plant's 88 employees and external contractors are trained in areas such as safety and health hazards, emergency operations and are encouraged to raise 'yellow cards' for near-misses. The number of staff 'good ideas' for improvements has reached more than 900 since 2012.

Lessons learned Program ***Category Winner***

Celanese

The Awards jury was impressed by the self-critical candour exhibited by Celanese in its approach to improving its process safety performance.

A corporate wide process safety culture survey developed and delivered in 2011 exposed incident sharing as an internal weakness for Celanese. Further analysis - in interviews and additional surveys - confirmed that key incidents from the past were not part of the corporate culture. To close the gap the company launched its Lessons Learned initiative aiming to go beyond incident communication and 'deeply' embed knowledge of incidents and the mitigations in the organisation. This is achieved by constant reinforcement of the message, by retelling the company's story.

The programme is divided into five parts. The intention of the first part - Global Lessons Learned - is to show each manufacturing employee why process safety is important by telling

the story of major incidents. So not to dilute the impact, this portion is limited to a few videos including the explosions at Pampa (1987), Cangrejera (1996) and Edmonton. The Industry Learnings and Event Sharing parts are in catalogue form showing, respectively, industry incidents that are applicable to Celanese and process safety incidents that have happened at all Celanese sites since 2010. The programme also features short videos by all employees to encourage their participation in the process and technology-specific process safety rules.

Pro-active safety

Clariant

Clariant's investigations into a warehouse accident at one of its production sites in July 2012 led to an overhaul of operations and a tightening of maintenance schedules. The supervisor - who tried to press-button shut a fire door separating a battery charging room from the warehouse area - did not suffer severe injuries following the explosion.

Now all sealed lead-acid rechargeable battery sets are inventory listed; manufacturer replacement dates are not exceeded; the installations are properly checked and included in a regular maintenance system for safety relevant devices and the battery set containment adequately ventilated.

Dow Stade Loss of Primary Containment (LOPC) Reduction Efforts

Dow Deutschland AG

The Stade plant's LOPC record was, until four years ago, patchy - one year its record was good followed by a year of six or more LOPCs. Improvement efforts have resulted in the number of significant LOPCs (ie a spill amount >50g) heading towards 0-2-a-year with a LOPC-free period of more than 1.5 years from mid-2012 to early 2014.

The LOPC reductions in combination with a Process Safety Incident (PCI) free time of more than five years (almost 25 million working hours) have been accomplished by in-depth utilisation of Dow's global work process combined with local expertise, employee ownership and entrepreneurship.

Focus on Process Safety Leadership in LyondellBasell at the Carrington Site, UK

Lyondell Chemie Nederland B.V

The Carrington site adopted Goal Zero process safety targets in 2010 encouraging employees and contractors to question current methods, share opportunities to improve and stimulate reporting process safety 'near misses'. It fostered a culture of open information sharing.

Occupational safety performance improvements since 2010 have been achieved by making safety personal. And by intensifying refresher training for both operations and maintenance staff. Site managers have attended the National Skills Academy for the Process Industries Process (NSAPI) Safety Leadership course and all operators have completed the NSAPI Process Safety Operations course. Site management has integrated human factors principles into several elements including incident investigation, safety critical tasks, control panel layout and management inspections.

The TIC Safety Way: Using the Herrmann Brain - We Got Safety Covered

Pfizer Pharmaceuticals Ireland

Within Pfizer's Newbridge, Ireland, facility the Technology Innovation Centre (TIC) is unique. It is the first gateway for new APIs, processes and technologies - primarily used for small-scale experimental processes supporting new product (tech) transfers, clinical manufacture and investigations. Its activities pose unique safety challenges, as most actives are new, innovative and non-standard.

To instil .a fresh, robust and more sustainable way of thinking about safety and seeking solutions Pfizer introduced Herrmann International's Whole Brain® Thinking System in late 2014. It is composed of four brain facets - creative, big picture thinking, logical/rational and organised/planned thinking and interpersonal feelings. This system was underpinned by the GEMBA process of observing the process in action (GEMBA is the Japanese word meaning 'at the site').

Its application in the TIC has heightened safety awareness, increased reporting and staff engagement. Since the method began it has triggered an alternative sample disposal system (saving €40k-a-year), a 200% increase in reported EHS issues, leaner manufacturing processes, 100% compliance with internal auditing schedules and zero observations from external auditing bodies.

Piping thickness control on hot pipes during operation

TOTAL GRANDPUITS refinery France

Corrosion on a carbon steel pipe led to an inspection programme (500 checks) on all carbon steel hot piping (250-380^{o} C) from atmospheric and vacuum distillation units at the Grandpuits refinery. Thickness checks are normally only undertaken when the plant is shutdown for turnaround. By introducing an ultrasonic technique -the EMAT (ElectroMagnetic Acoustic Transducer) - Grandpuits was able to while the plant was running.

Reliable measurements on ferromagnetic or conductive materials at high temperatures (100-500^{o} C) are enabled by the EMAT technique. Other benefits include no need for fluid couplant or significant surface preparation, better preparation for turnarounds (avoiding late discovery of pipe replacement needs) and better prevention of loss of containment. The technique, used in 2014, contributes to the prevention of major accidents.

Remote management of Rail Tankcar fleets

TOTAL Refining & Chemicals

To improve management of its fleet of rail tank cars - stimulated by a request from authorities to 'always keep a register of the trains parked on it tracks' -TOTAL launched a multi-faceted project. Objectives included improvements in the quality and reliability of information tracking rail tankcars (the Grandpuits refinery can handle c 320 rail tankcars on 16.5 km of railway), avoidance of inconsistencies between the database system and the field, replacing the paper system by an ergonomic electronic tracking system and enable railcar data updates in real time.

TOTAL's IT department delivered the original solution of using public (encrypted) 3G/4G communication to link field operators to the rail car management system of the refinery. Information previously only available in the control room is now also available on site. From a

safety perspective, the system allows safe and real time quality control of rail tankcar movements, avoiding track congestion and minimising incident risks.

PRODUCT STEWARDSHIP

AkzoNobel Priority substance program - ***Category and top 3 Winner***
AkzoNobel NV
Jurors picked this entry as the Product Stewardship Category winner and in the overall winners discussions it was recognised as a top 3 entry. Further details are available in the Winners leaflet

CompTox Suite - A Tool for a Reliable Safety Assessment of Chemicals Using Less Animal Studies and Contributing to Animal Welfare
Clariant Produkte (Deutschland) GmbH

EU chemicals regulations (REACH) require registrants to avoid animal testing. Rising to that challenge Clariant has devised a tool that is a combination of an in silico predictor (for chemicals risk and safety assessment), an early warning system (on potential chemical hazards) plus a screening tool to ID potential hazardous substances in an existing portfolio. Its CompTox Suite combines and integrates the functions of the in silico tool 'AMBIT' with high quality (eco)toxicity data from the REACH database 'IUCLID'. This step was developed within the framework of a Cefic LRI project.

In addition, CompTox Suite links computational prediction tools with 'AMBIT' enabling toxicity predictions from chemical structures/structural moieties/metabolites and allows read-across and category approaches as useful techniques in the safety (hazard/risk) assessment of chemicals. Experimental verification is also possible using a high-resolution MS analysis to detect predicted metabolites in urine and blood samples. As a result, the number of animal experiments, especially long-term chemical assessment studies, can be significantly reduced.

In the overall winners discussions jurors awarded this entry a Special Commendation. Further details are available in the Winners leaflet.

Special Commendation Winner

VECAP - Voluntary Emissions Control Action Programme @ CTF2000 NV, first certified textiles user worldwide
CTF2000 NV

Full replacement of organo-mercury catalysed elastomers technology, 5 years before REACH compliance mandate
Dow Polyurethanes

The proposed EU phase-out of organo-mercury catalysts in polyurethane (PU) elastomers triggered Dow Polyurethanes' search for alternative mercury- free solutions. During an 18-month project, begun in September 2010, Dow discovered novel catalyst compositions, new synergistic catalyst combinations plus processing and material science solutions The mercury-free alternatives - applicable to around 140 formulations - required eight different catalyst packages in order to replace just one previously used in the mercury containing catalyst.

More information about Responsible Care Awards 2015 : www.cefic.org/RCAwards2015

Dow's complete set of re-engineered PU elastomer products launched at UTECH Europe 2012. They came on to the market a few months later (September), five years prior to mandatory EU REACH compliance for the removal of five phenylmercury substances In April 2015 Dow launched its MBOCA-free PU elastomer technology and continues research and innovation on other REACH compliant solutions.

Dow VORATHERM™ CN 100 – Halogen Free FR Polyisocyanurate Insulation Foam

Dow Polyurethanes

Anticipating the possibility that future legislation may call for the phase out of TCPP (tris [2-chloroisopropyl] phosphate) and other halogenated compounds - that today do not exhibit specific HSE issues - Dow Polyurethanes initiated an R&D project to develop the next generation of polyisocyanurate (PIR) insulation foams. The lab development phase was completed in 2013 - having secured satisfactory heat release performance and a 50% reduction in smoke density vs the best available baseline product - and the project moved to pilot validation on industrial lines, internal premises and panel producers.

Pilot tests confirmed good process ability and the suitability of VORATHERM CN 100 for insulated metal panels. Panels produced with this technology have been externally tested for official Euroclass certification and it was officially launched in 2014.

Hungry for change

European Crop Protection Association (ECPA)

Addressing concerns linked to the use of plant protection products the Association launched its Hungry for change initiative focusing on food residues, water and biodiversity protection and health. The food residues management project is a joint industry and the Cajamar Caja rural research station 'Las Palmerillas' in Almeria. The project has included development of a best practices manual to support trainers in their train-the-trainer programme. In 2014 and 2015, two workshops have trained >100 advisers from Turkey's Antalya region. The established TOPPS water protection project - through which more than 7,000 trainers/farmers have been trained in reducing pollution from agricultural sources - has intensified its best management practices by connecting more directly to farmers.

The Safe and Sustainable Use Initiative (SUI) delivers advice on the basics - what to wear when handling and applying pesticides, where and how they should be stored and how to apply them. Container management (CMS) systems are active in 11 countries, six new pilots have been launched and three more being discussed.

Product Stewardship Program

Fertilizers Europe

The European association of fertilizer producers, Fertilizers Europe's product stewardship program began in 2003, with the first audit in 2005. In 2014, all 15 Fertilizer Europe member companies successfully passed the audit and since 2000 the sector's Loss Time Injury Rate (LTIR) has fallen by >50%. Its program qualifies to the highest level established by the International Fertilizer Industry Association.

Publications - covering production, storage and transport - are regularly revised and updated and the association is releasing a full Infinite Product Stewardship book that includes all elements of that program. Fertilizers Europe also maintains the industry's most comprehensive database of incidents dating back to 1920 - used as an on-line learning tool for members.

LyondellBasell Product End Use Assessment and Management, including Prohibited and Restricted Uses

LyondellBasell

Adding to and improving end use assessments in product risk reviews has been an ongoing project at LyondellBasell - 2015 will mark the third year using the process - aimed at ensuring the company does not knowingly provide product for use in a prohibited application.

Improvements in the process include an alternate, simplified categorisation process for low hazard polymers and identify "generic" risk management measures and harmonization of product risk review process across all business segments worldwide. Its 2012 issued global Healthcare and Medical Applications Policy has been refined and reissued in 2014.Developed in 2013-14 and issued in Q4 2014, the Prohibited and Restricted End Use Application policy calls for contact with customers and distributors to enforce prohibitions and conduct evaluations for restricted applications.

Tenaz for Latin America

Taminco BVBA, a subsidiary of Eastman Chemical Company

The purpose of the Tenaz project, started in 2011, was to increase rice crop resistance to diseases in the light of an estimated average 37% crop loss to pests and diseases. Taminco developed a new growth regulator specifically designed for rice that it named Tenaz, the Spanish word for tough and durable. Sand-derived Tenaz stimulates the natural plant processes to withstand stress resulting in higher yields and improved grain quality.
Following successful trails and registration in Uruguay Taminco is currently registering the product in several other Latin American countries.

SECURITY

Chemical Security ***- Category Winner***

Chemical Business Association

Britain's CBA has a 20-year track record of prioritising chemical security and given higher terrorist threat risks it continues to work to improve members' performance. The Code of Conduct, introduced in 2010, obliged all member companies to report any potential or actual security incidents to CBA regardless of whether they already had a legal obligation to undertake security risk assessments.

Its Code of Conduct evolved into the FECC's European Voluntary Agreement on Trade Controls in 2013 and was recognised by the World Custom Organisation's Global Shield Programme later that year as an exemplar of best practice as a voluntary contribution to chemical controls. The Code was revised and adopted by the International Council of Chemical Trade Associations in December 2014.

The CBA's security expertise is internationally recognised. During 2014 and 2015, it was invited to address meetings organised by the US Department of State, the Federal Bureau of

Investigation (FBI), the Organisation for the Prohibition of Chemical Weapons (OPCW) and the World Customs Organisation.

Michelin Transports Tyres Safely: Initiative for a Guideline on the Safe Transport of Tyres and its Practical Implementation

Michelin Reifenwerke AG & Co. KGaA

Responding to a gap in operational procedures and a lack of legal safety obligations, Michelin, Germany approached the national association of tyre manufacturers with the idea of producing a guideline. The idea touched a nerve and Michelin's internal documents provided the basis for the guideline, which in 2013, was certified by DEKRA.

Michelin in Karlsuhe also developed a number of practical guidelines. Seminars on securing loads are given to all Michelin's German employees who are responsible for securing loads as well as warehouse employees and service provider employee who load Michelin products. Other seminars cover tyre stacking and vehicle inspection checklists. The company has an internal complaint system to trace deviations in load securing.