

Winter 2024

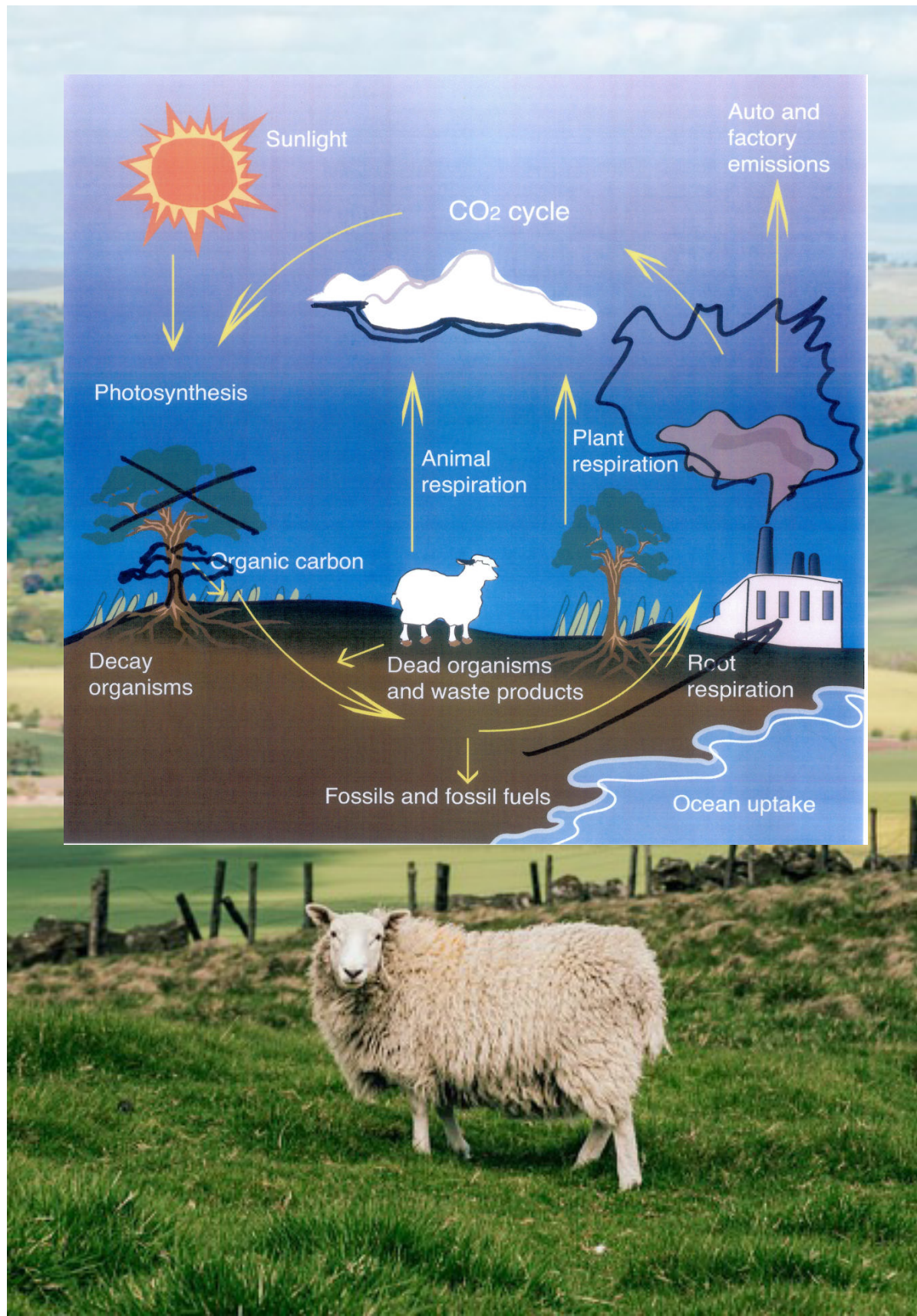
Spring 2025

Managing the planet

FLASHPOINT



NZ INSTITUTE OF
HAZARDOUS
SUBSTANCES
MANAGEMENT



USEFUL ORGANISATIONAL CONTACTS

NZ Institute of Hazardous Substances Management

www.nzihsm.org.nz

The official home of professionals committed to the safe management of hazardous substances and dangerous goods. The NZIHSM is a 'not for profit' industry association specialising in improving safety, health and (site) environmental performance, particularly the safe management of hazardous substances in the community.

Responsible Care NZ

Box 5557 Wellington 6145

Responsible Care NZ works with industry partners to implement the hazardous substances legislation.

WorkSafe (MBIE)

www.worksafe.govt.nz

Government agency formed to provide compliance and enforcement of hazardous substances. Responsible for hazardous substances certificates.

EPA

www.epa.govt.nz

The EPA administers the HSNO Act and supplies extensive information on working with hazardous substances.

Ministry for the Environment

www.mfe.govt.nz

The Ministry administers the HSNO Act, and provides policy, publications, technical reports and consultation documents.

HAZANZ

www.hazanz.org.nz

An association of the safety organisations in New Zealand.

Institution of Chemical Engineers

Since 1922 the multi-national IChemE has advanced chemical engineering's contribution for the benefit of society. Its offices include UK, Australia and New Zealand.

Local Government NZ

www.lgnz.co.nz/lg-sector/maps/

Local Authorities have responsibility for policing building controls. Some local authorities are contracted to Department of Labour to provide enforcement of the Hazardous Substances legislation.

President's message

Changes all around us!

In this Spring edition of *Flashpoint*, our NZIHSM team continue in our goal of "protecting, people, communities and the environment", commenting in articles as follows:

- (i) A long way from Plankton- How humans can manage our Planet!
- (ii) Black swans are actually White?
- (iii) Can the team be Coach and Cop?
- (iv) Geneva Protocol -100 years of prohibiting chemical weapons
- (v) Explosive disasters continue !
- (vi) Uncle Archies ramblings

It has been found that when humans work together, most progress is achieved. In contrast, some humans appear to prefer to fight each other as is evident in Gaza and the Ukraine, but fortunately, most seem to understand that working together is actually better for all. There has even been debate as to whether those in authority should only enforce and not provide guidance.

The answer to this is possibly best characterised by the 2025-year-old founding doctrine of the western world of "Treat others the way you wish to be treated yourself", which would suggest that some guidance or assistance should be useful to all concerned !

Good regulations have positive goals such as "Protecting people, communities and the environment against the adverse effects of hazardous substances".

Thank you to all those who have coached and helped their fellow humans, rather than punish them, as we agree this does promote trust which is safer to all concerned.

Hopefully we will be continue to solve the problems of our planet, before the problems sort us out!

All the articles are interesting reads.
Enjoy!

John Hickey
NZIHSM



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Cover photo Carbon cycle- on free
pixabay photo

Flashpoint

Flashpoint is the official journal of the
NZ Institute of Hazardous Substances
Management.

Editorial material does not necessarily reflect
the views and opinions of the Institute.

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Black swans are actually white

Black swans are actually white – it's a matter of definition!

Originally black swans were thought not to exist, and that all swans were white. Consequently, references to black swans were made when referring to something that was thought to be extremely rare, or extreme impact, and only predictable in retrospect?

A black swan is defined by:

1. It is outside the realm of regular expectations, and nothing in the past can convincingly point to its possibility.
2. It has an extreme impact.
3. In hindsight, an explanation can be concocted, thus rationalising the event.

Almost all major scientific discoveries, historical events and artistic accomplishments are arguably "black swans". Examples include the rise of the Internet, World War 1, the Covid-19 pandemic and the 2001 attacks on New York's World Trade Centre.

Every day there are a multitude of events that occur. Most have an inconsequential impact and therefore it does not matter whether they are known and predictable, known but unpredictable or simply unknown. However, for an individual faced with assessing the potential impact of any event, the difficulty is the implication that he or she has the capacity to make an accurate assessment of his or her ability to distinguish a good decision from a bad one, relating to the potential impact of an event being assessed. Or as it is often put: "If you don't know what you don't know, how can you know?"

This conundrum is often referred to as the Dunning-Kruger effect, after the two psychologists who first described the effect in 1999.

We face precisely this conundrum in investigating workplace incidents with negative impacts. We are faced with what generally at the outset of the investigation, appears to be a black swan event, apparently entirely unpredictable,

but that should be explainable with hindsight. However, our conclusion will almost always lead us to confirm that the incident was really a white swan event, i.e. it was predictable, and could have been prevented.

But, as the saying goes, if hindsight was foresight, we'd all be millionaires. Workplace safety is not about how smart we are and a lot to do with how we behave. It is about expecting the unexpected. Rather than crystal ball gazing, we can only endeavour to minimise risk through safety consciousness, and the use of tools like hazard and operability analysis.

– Dave Lascelles

First ever NZ toxic case

The sale of acutely toxic substances has resulted the first-ever standalone prosecution brought solely under the Hazardous Substances and New Organisms Act 1996.

Hamilton Chemicals Ltd pleaded guilty to what prosecutor Stephanie Bishop said was quite a unique set of charges. The company failed to comply with record-keeping compliance around the sale of various hazardous substances, including transactions labelled simply as cash sales, and its sales to unknown individuals. The offending involved the sales of 'IRENMOROZ/123RF, which under the Hazardous Property Controls Notice, are substances which can only be supplied to workplaces. Each charge had a maximum penalty of three months' imprisonment or a \$500,000 fine, and, if the offence is a continuing one, to a further fine not exceeding \$50,000 for every day or part of a day during which the offence has continued.

Bishop said saving paperwork in a folder labelled 'EOA bull...' demonstrated flagrant disregard for the relevant controls, noting 10 sales were to individuals, "and we still don't know where the chemical has gone". The judge initially set a sentence starting point of a \$50,000 fine, but with reductions for guilty pleas and previous good character, fined the company \$35,000 plus \$143 court costs.





A long way from plankton

Citizens of our Universe, this may be hard to believe, but there is a small group of lifeforms on a tiny planet circling a rather small sun in a moderate galaxy in our vast universe, called Humans.

Over the recent past, this little band of beings have started to realise that they too are part of the earthly world around them and that all members of this world are made of mass and energy which in many ways can be described as chemicals.

What is more, some of these humans are just starting to realise how new they are in this universe, and that all of their surroundings are comprised of energy and atoms that can bond together in almost miraculous patterns to form substances called chemicals that are of use to us all.

Their water, their air, their land, their food, their trees, their sun, their moon, their stars, their stones, their fish, their insects, their mammals, their machines and computers, and yes, even themselves as humans, are comprised of chemicals working together in a balancing process.

What is more is that these Humans may be new on the evolutionary scale, having only been around in their present state for a few hundred thousand years on their Earth world, which has been around for some 4.5 billion 'earth-sun' years in our universe which general 'big-bang' theory states is around 13.7 'earth-sun' years, but may even be as old as some 26 billion 'earth-sun' years. Whatever the truth, our chemical mass and processes have been around a very long time, and some of these humans have recently learnt to think and indeed become sentient beings and realise that they too are part of their planet and universe.

Some humans feel old, but they have actually been around for only 0.007% of their planets existence or 0.002% of the start of our universe for those of us who believe in the 'Big bang' theory of the Universe's creation. These 'recent arrival' Humans have only been around for under one-second of their Earth's total 'Life-day' to date.

As some of this universal matter gained life-form, and then later a self-realisation that it existed, it learnt to think and only now are some intelligent humans beginning to realise that they are not the "Masters of the Universe" but in fact "local managers" who are initially tasked with managing the planet Earth that they call home. Humans are not the first with this task, as the animals now called dinosaurs had this task for some 165 million years, or a whole hour of the total earth-day, but left abruptly some, 20 'earth-life' minutes, or 65 million years ago.

But how does one manage a planet and how does the Planetary process work? To understand the planetary process we must realise that the planet is made of mass and energy,

The mass is made of atoms which are comprised of a central mass or nucleus and even smaller particles (or electrons) rotating around the nucleus using some of the energy inherent in each atom. The energy is also bound in each atom and following Einstein, humans realised that there is a tremendous amount of energy, $\text{Energy} = \text{Mass} \times \text{Speed of Light}^2$ ($E=mc^2$) bound within the mass of each atom.

Energy is important, as humans use this for heat, warmth and travel but as with all energy and forces, the process management is also important as we only want enough energy for our task, and not the full energy from an atom which can overwhelm us such as in the case of a 'nuclear explosion'.

Often it is easiest to get energy from the smaller atoms, like in the case of hydrogen, molecular weight = 1, which is easier to release energy from and perhaps why hydrogen powers Earth's Sun.

Human's ability to manage the Earth will be greatly dependent on their ability to understand the chemistry process of their planet along with how to 'balance the process'.

Balancing the process

Earth is formed of mass and energy and this is formed of atoms. Once humans learned to think, they realised that different atoms react with each other to form compounds such as hydrogen and oxygen which react to form H_2O or water, which occupies a vast area of planet Earth but is also essential for life as they know it.

On planet earth the sixth smallest atom Carbon MW-12, has combined with the smallest

Hydrogen to form the hydrocarbon compounds which amazingly on Earth have also formed the initial organisms and Life compounds starting the chemistry known as Organic chemistry.

Even more amazing was when these Hydrocarbon-organisms became larger forming small plankton, then to larger fish, then to land insects, reptiles through to animals and mammals many of whom developed thinking as part of that life.

Perhaps the most unexpected of these life-forms were the human species who gained a spirit and

realised that they were thinking beings, who then, in recent times learnt fire and tools along with how to work together

through tribal communities which allowed them to dominate often larger individual animals around them and in effect manage all of their surroundings.

Perhaps even more amazing was that humans studied the world around them and then shared that knowledge, allowing them an understanding of how chemicals react with each other in often a positive way such as burning fuels (or hydrocarbons) to create Energy but at the same time can have potentially hazardous side effects such as escaped energy or carbon layering on the clouds to trap the Sun's hydrogen energy or raise temperatures to uncomfortable levels through this process.

Chemists often write these processes in the form of equations showing for example how compounds can react forming new compounds. For

example in the case of the simple combustion reaction using the 'burning' of air's oxygen and a hydro-carbon to create carbon dioxide plus water but during this process releasing a hopefully controlled amount of energy for heating or to drive transportation. Eg: $\text{CH}_4 + \text{O}_2 \Rightarrow \text{CO}_2 + \text{H}_2\text{O} + \text{Energy}$. (ie: natural gas (methane) + oxygen goes to $\Rightarrow$ carbon dioxide plus water plus energy)

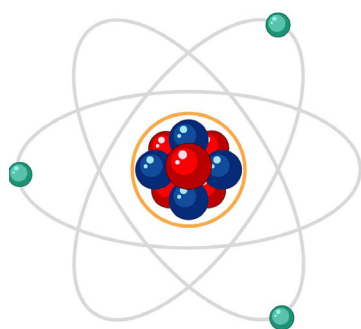
Humans were lucky that the nature of the Planet was large enough to cope with humans successful early efforts to create themselves a thermal wonderland which was great and allowed humans to rapidly expand populations since hydrocarbon petroleum products were discovered in the 1840s.

However, such was this expansion and use of hydrocarbon energy, that carbon layers started to form on the atmospheric clouds to trap the Sun's energy on the planet and raise the heat through a process known as global warming or 'greenhouse' effect. This warming, while pleasant in places, can also have a negative or hazardous effect in that hot air can melt land-ice and raise sea levels, it can create more energy in storms and hotter air holds more water leading to bigger floods once the rainwaters do arrive.

Some of the more thinking members of the human race are realising that in order to continue to enjoy a nice human-pleasant **planet equilibrium** on planet Earth that they too must BALANCE the PROCESS and work with nature to maintain equilibrium and successfully manage their planet. If, as in the case of the former dominant dinosaur species, they cannot work successfully alongside their planet, then human's too may follow that path and sadly become 'former' manager's of their planet !

- John Hickey

ATOM STRUCTURE



- Nucleus
- Electron
- Neutron
- Proton
- Orbit

"Coach or Cop" .. or Both !

In a June 2025 article Radio NZ indicated that the Workplace Relations Minister Brooke Van Velden has reported the results of the over 1000 respondents to a survey that she asked the MBIE team to carry out to gauge the New Zealand public's opinion of the Worksafe department since the Hazardous substance regulations of 2017 following the Pike River Mine tragedy of 2010.

It was reported that as a result of this survey "WorkSafe is being urged to soften its tone, sharpen its focus, and become an enabler of safe work, not just an enforcer of compliance, as part of significant changes to New Zealand's health and safety regime." Minister van Velden says WorkSafe must now be a coach, not just a cop.

The issue continues and reappeared in the *NZ Herald & RNZ* on August 25 stating that a separate review had been carried out by Worksafe and MBIE who strongly disagreed in providing guidance, but that only a strong prosecutorial background would prevail, and rather than guide, Worksafe should continue its 'enforcement' stance to all concerned. It even used the Pike River as an example with resulting prosecutions being useful to 'stopping' such an action happening again.

Plans to reform workplace safety rules risk repeating the deadly failures of the Pike River mine disaster, officials are warning. WorkSafe itself cautioned that relying on broad guidance

rather than regulation could create loopholes where companies engaged in unsafe practices, but could not be prosecuted. In addition, documents released to RNZ reveal a damning internal review found no evidence that the changes would actually reduce injuries or deaths.

NZ death rate dropping

However, the article did include an interesting graph that while pointing out that while NZ still has higher death rates per 100,000 workers than Australia and the UK, the NZ death rate appears to be continually reducing from 8.3/100k in 2005 to 3.2/100k in 2022 – a reduction of 250% over the 18 years of the hazardous substance legislation – hopefully a move in the right direction !



Brooke Van Velden

So, which is correct, should Worksafe be the "Coach or the Cop"? – especially with regards to the treatment of hazardous substances or chemicals in the community.

A chemical and process review

Perhaps to review this Coach vs Cop question, we could look towards the chemical, process and engineering teachings.

While it is arguable that as the human race discovered the uses of chemicals in the provision of food, building, fire and energy, and even in competing with the many other lifeforms (such as viruses, flies, and the like), that our understanding of chemical processes has allowed the human race to become the 'managers of our planet'.

These chemical discoveries have allowed humans to progress rapidly over just the past 400 years, allowing the production of enough food to grow our population from 1 billion to 8 billion people, build cities, develop rapid transport methods including flying around our Earth in under one day and even to the Moon beyond. It is indeed tremendous what we have achieved in a relatively short space of time.

It is a belief of many industrial chemical and engineering experts that it is not only the chemicals that are important, but it is also our understanding of the process followed that allows humans to achieve these great developments. Perhaps this concern for process can be better summarised by that oft used human expression of "Closing the gate after the horse has bolted".

This, in general means, that both cop and coach are important, in that some coaching or guidance into ensuring the gate is closed in the first place would stop the horse from bolting.

While we can punish the 'gate opener' all we like after that event, unfortunately the horse has already

bolted! However, a punishment may teach all others “Not to leave the gate open” so that all the neighbouring horses do not also have the chance to bolt over the horizon as well.

But how does this relate to the Cop vs Coach approach to the hazardous substance legislation?

The Pike river example

On 19 November 2010 there was an explosion at the Pike River coal mine on the West Coast where 28 miners died in this tragic underground accident. There followed an extensive investigation into this tragedy by a Royal Commission into Pike River 2012 which led to the closure of the previous Department of Labour and the formation of a new entity called Worksafe. The Royal Commission report found that:

- Twenty-nine men underground died immediately, or shortly afterwards, from the blast or from the toxic atmosphere.
- Natural gas or methane control is therefore a crucial requirement in all underground coal mines. Control is maintained by effective ventilation, draining methane from the coal seam before mining if necessary, and by constant monitoring of the mine's atmosphere. The reports of excess methane continued up to the very morning of the tragedy. The warnings were not heeded.

It was the commission's view that executive managers paid insufficient attention to health and safety and exposed the company's workers to unacceptable risks. Mining should have stopped until the risks could be properly managed.

It also found that the Department of Labour did not have the focus, capacity or strategies to ensure that Pike was meeting its legal responsibilities under health and safety laws. The department assumed that Pike was complying with the law, even though there was

ample evidence to the contrary.

Ventilation

A mine ventilation system must provide fresh air throughout the workings, and take return (foul) air out of the mine. At Pike River the intake of fresh air was from the portal, and return air was expelled to the surface up the ventilation shaft. The main fan and movable auxiliary fans circulated the air, although these had failed at the time of the explosion.

Methane management

To provide safe working conditions in a gassy coal mine effective methane management is essential. (as detailed below)

Safe practice and guidance at Pike River

The report on the Pike River experience states that this mine was a 'gassy mine' with significant methane present and it was also running behind in its profit budget encouraging more work in potentially hazardous areas. In particular three controls that manage the risk were unfortunately undersized for the task namely:

1. Ventilation

The ventilation system was not sized or efficient enough to always supply adequate ventilation into the mine shaft to keep it outside of explosive limits

2. Methane sensors

The mine had Methane/Oxygen ratio sensors (&LEL, %UEL) to sense that the mine was operating outside the methane explosive range. Unfortunately many of these were Not Working or blocked on the day of the explosion

3. External guidance

There had been no independent inspection visits from the regulatory authority for a number of years which also contributed to the above failings going unnoticed.

Tragic result

In this case the end result was an Explosion and the resulting loss of 29 lives which could possibly have been avoided if the Mine adopted

a 'safety-practice' of Stopping work until immediate and the very real 'explosive' safety issues could be resolved.

Pike River Commission findings

To reduce the risks of future tragedies, the Pike River Royal commission made 16 principal recommendations, some critical to all industries being set-out below. The changes recommended by the commission stated the principle that “health and safety in New Zealand can be improved only by the combined efforts of government, employers and workers.”

Explanation

There were 16 primary recommendations with four that relate to all industries below:

1: To improve New Zealand's poor record in health and safety, a new Crown agent focusing solely on health and safety should be established. The Department of Labour was closed and 'a new Crown agency' called Worksafe was established.

Recommendation 3: Regulators need to collaborate to ensure that health and safety is considered as early as possible and before permits are issued.

5: The statutory responsibilities of directors for health and safety in the workplace should be reviewed to better reflect their governance responsibilities.

6: The health and safety regulator should issue an approved code of practice to guide directors on how good governance practices can be used to manage health and safety risks.

7: Directors should rigorously review and monitor their organisation's compliance with health and safety law and best practice.

These recommendations implied that the new crown agency, Worksafe, should be involved in the guidance of directors and their workplaces to ensure that safety

aspects could be followed BEFORE an unsafe incident and not just prosecutions after an incident. However, it was also identified that it could be conflicting, for the regulator to provide guidance but then be responsible for prosecuting an organisation for any issues in following that guidance in case of an incident at a later stage. This conflict issue was also identified in the 2023 White island volcano case.

A safer way of coaching – Independent chemical advisors & the compliance certifier

To assist with this process as part of the new Crown Health and Safety Agency (Worksafe) there were existing private sector Hazardous Substance Compliance certifiers that had, since the 1984 ICI Fire, been approved for hazardous substance industry reviews who could provide independent hazardous substance guidance to organisations exposed to potentially hazardous substances at a rapid and relatively low cost to Industries.

These compliance certifiers were tasked with regularly visiting potential chemical risk sites to assess the safety systems at that Workplace and advise of any

risk factors against mainly the flammability and toxic risks of hazardous substances (or chemicals), prior to issuing a compliance certificate.

Through this method guidance would be provided to the sites independent of any prosecutorial demands with the guidance hopefully minimising the HS site's risks prior to a tragic incident occurring.

From the results obtained from an EPA report 2017 this indicated that this certification and similar industrial chemical safety advice has lowered 'workplace chemical exposure' and hazardous substance accidents and the subsequent need for prosecutions by the authority to defer ongoing safety shortcomings after the tragic events. Based on the findings to date, and industrial chemical, process and engineering advice, it would appear that rather than debate whether the Worksafe agency should be 'Coach or Cop', the best process is probably 'Cop and Coach' – that is, a mixture of both.

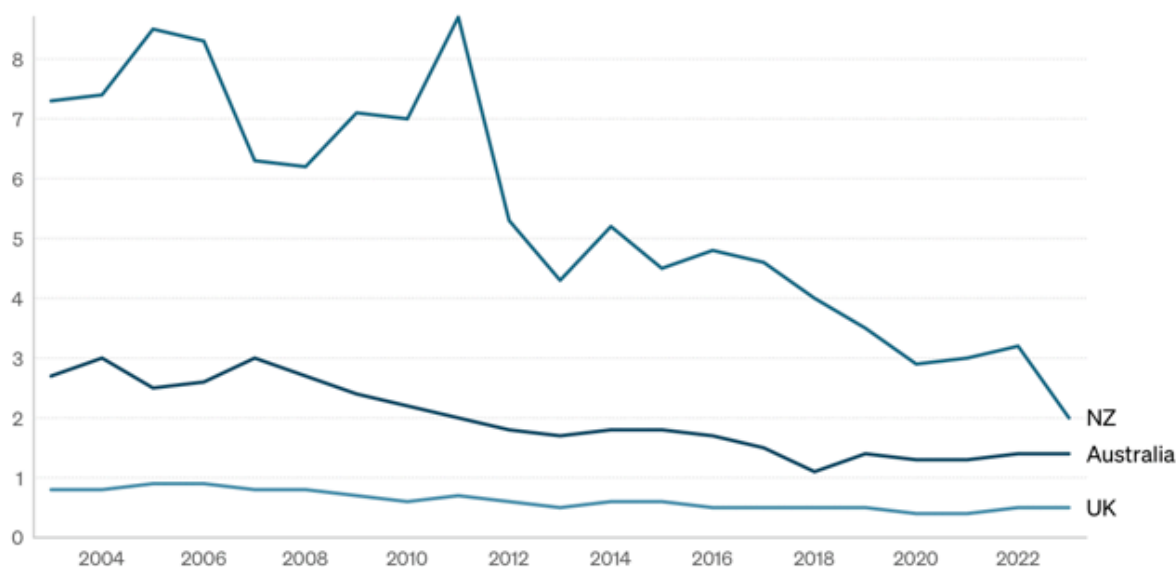
The August 25 RNZ article did include an interesting graph that indicated that while NZ still has

higher death rates per 100,000 workers than Australia and the UK, that the NZ death rate appears to be continually reducing from 8.3/100k in 2005 to 3.2/100k in 2022 a reduction of 250% over the 18 years of the hazardous substance legislation, certainly a move in the right direction.

This graph would indicate that the HS compliance certifiers, chemical and industrial engineering and general safety advisors are making progress towards meeting similar targets, if not better than our overseas compatriots. The graph would also indicate that, while New Zealand may have started from a riskier base, it is also improving at a faster rate in improving workplace deaths than our offshore partners. In order to prevent the incident occurring the "Coach – or guidance information" should occur at the start of operations to hopefully identify all issues and prevent the tragic incident occurring.

After any incident and to avoid a repetition of hazardous operations from re-occurring, the 'Cop or prosecutorial approach' may defer other parties from making the same mistakes.

Fatalities per 100,000 workers



So, in summary, it would appear that the preferred approach should not just be 'Coach or Cop', but developing the team for Coach and Cop' to enhance safety for all concerned.

Explosive disasters continue

Iran: In April, a southern port in Iran was rocked by an explosion. At least 70 people were killed in the blast, and more than 1000 people were injured. The port reportedly handled a chemical component, believed to be ammonium perchlorate, needed for solid fuel for ballistic missiles; used by Iran in its war with Hamas in the Gaza Strip. The blast disintegrated a building next to the blast site, and shredded other buildings in the vicinity.

The force of the blast produced two craters measuring some 50 metres across. Other containers nearby were smashed and distended by the explosion and the intense fire that followed. Coincidentally, the explosion happened while Iran was in negotiations with the United States over its rapidly advancing nuclear programme.

China: In May, a huge explosion rocked a chemical plant in China's eastern Shandong province, killing at least five people and injuring 19, according to local emergency management authorities. Observers

reported a column of dirt-yellow smoke, tainted with redness, rising from the plant, and an associated objectionable smell. The cause of the explosion was determined to be a runaway polymerisation reaction with chemicals used to manufacture glyphosate-based pesticides.

Workplace safety has reportedly improved over the years in China but remains a stubborn problem. The National Ministry of Emergency Management recorded 21,800 incidents and 19,600 deaths in 2024.

India: In June, at least 42 people died in an explosion and fire in a pharmaceutical ingredients plant in southern India. At least 25 others were hospitalised with burns and other serious injuries. The explosion

occurred in the reactor area of the factory, igniting a massive fire and flattening the multi-storey building, leaving dozens trapped under the rubble. Investigations suggest that the explosion occurred following a pressure build-up in a spray dryer unit processing microcrystalline cellulose, possibly due to an air handling system malfunction. Officials report that the hazardous materials display board at the site entrance was blank when rescue workers reached the site, leaving them unaware of the nature of the material they were handling.

Meanwhile in April, explosions at two illegal fireworks factories in India killed 29 people, including 12 children. The incidents highlight the extent of India's informal firecracker industry, and the lack of enforcement of regulations intended to eliminate illegal production.



USA: A chemical release at a commercial explosives manufacturing plant in Ohio in June, resulted in the evacuation of nearby towns and air restrictions. The incident occurred after a partially-filled nitric acid storage tank experienced an unanticipated chemical reaction that generated nitrogen oxide gas inside the tank.

– Dave Lascelles

Above: **Thick, toxic smoke marks the Iranian port explosion.**

Left: **Fire finished off what the explosion didn't.**



Geneva Protocol 100 years old, but!

The Geneva Protocol was drafted 100 years ago, intended to prohibit the use of chemical and biological weapons in war, not their development or production. Signed in Geneva and effective from 1928, it was considered a landmark agreement in international humanitarian law, although its effectiveness was limited by a lack of enforcement and verification mechanisms.

Drafted and signed in 1925 under the auspices of the League of Nations, the protocol became effective on February 8, 1928. However, like so many 'moral' issues that come up against vested interests, its effectiveness was hampered by the lack of enforcement and verification measures. Since World War I, despite the protocol, chemical weapons have caused more than one million casualties globally.

During the Cold War, the United States and the Soviet Union both

John Singer Sargent's graphic depiction of Allied gas casualties, many blinded, helping each other to the rear lines.

maintained enormous stockpiles of chemical weapons, amounting to tens of thousands of tonnes. The amount of chemical weapons held by these two countries was enough to destroy much of the human and animal life on Earth. While no-one wanted to be the first to use them in WWII, chemical weapons were deployed on a large scale in almost all theatres, leaving behind a legacy of old and abandoned chemical weapons, which still presents a problem for many countries.

First agreement

The first international agreement limiting the use of chemical weapons was made in 1675, when France and Germany came to an agreement prohibiting the use of poison bullets. Almost exactly 200 years later, in 1874, the next agreement of this sort was concluded: the Brussels Convention on the Law and Customs of War. The Brussels Convention prohibited the employment of poison or poisoned weapons, and the use of arms, projectiles or material to cause unnecessary suffering, although the agreement never entered into force.

Before the turn of the 19th century, a third agreement came into being.

The chemical disarmament efforts of the 20th century were rooted in the 1899 Hague Peace Conference. The contracting parties to the 1899 Hague Convention declared their agreement to 'abstain from the use of projectiles, the sole object of which is the diffusion of asphyxiating or deleterious gases'. A second Hague Convention, in 1907, reiterated earlier bans on employing poison or poisoned weapons.

Unprecedented extent

Despite these measures, the world witnessed the use of toxic chemicals in warfare to an unprecedented extent during World War I, with the first large-scale attack using chemical weapons taking place at Ieper, Belgium, on 22 April 1915. By the war's end, some 124,200 tonnes of chlorine, mustard and other chemical agents had been released, and more than 90,000 soldiers had suffered painful deaths due to exposure to them. Close to a million more people left the battlefields blind, disfigured or with debilitating injuries.

193 nations sign

On 29 April 1997 the Chemical Weapons Convention came into force – the world's first multilateral disarmament agreement to provide for the elimination of an entire category of weapons of mass destruction within a fixed time frame – 193 states committed to the convention, meaning 98% of





Army specialists at the USA's Blue Grass Chemical Agent Destruction Plant disassembling 155mm shells.

the global population lives under its protection.

72,000 tonnes destroyed

After 28 years of OPCW efforts, more than 72,000 metric tonnes of chemical weapons declared by the states-parties have been irreversibly destroyed. In 2023, the destruction of all declared chemical weapons was hailed as a great success, and a sign that the ethical and political taboo against the use of chemical weapons remains strong among states-parties.

However, in recent years, chemical weapons have been used in some countries, but their use has never been acknowledged by the perpetrators because of the strong taboo against their use. Syria's civil war is an example – the deadliest attacks were the August 2013 sarin attack in Ghouta (killing more than 1729 people and injuring 3600 patients), the April 2017 sarin attack in Khan Shaykhun (killing at least 89 people) and April 2018 Douma chemical attacks (killing 43 people and injuring 500 civilians).

The international scene...

Stockholm Convention

The 12th Conference of the Parties to the Stockholm Convention in May included the toxic pesticide chlorpyrifos and long-chain perfluorocarboxylic acids in the Persistent Organic Pollutants control list. The latter belongs to the family of perfluoroalkyl and polyfluoroalkyl substances. The production of these two substances is theoretically banned globally starting from January 1, 2026. However, the resolution includes a special exemption period of five years, primarily aimed at the firefighting foam manufacturing sector.

Asia refines POPs rules

More than 30 Asia-Pacific countries, including India, Japan, Thailand and Vietnam, signed the Jaipur Declaration on the 3Rs and Circular Economy. This framework aims, among other goals, to reduce hazardous chemicals and persistent organic pollutants (POPs) in materials, products and waste, including plastics. The voluntary, non-binding declaration was adopted at the recent High-Level 12th Regional 3R and Circular Economy Forum in Asia and the Pacific, held in Jaipur, India in March.

It is the successor to the Hanoi 3R Declaration (2013-23), an umbrella policy framework for developing and implementing reduce, reuse, recycle (3R) policies and programmes across Asia-Pacific. The new declaration sets 13 voluntary goals, one of which specifically details the reduction and elimination of hazardous chemicals.

EC ammendment

The European Commission adopted an amendment in July to update limits for five polybrominated diphenyl ethers under the EU Persistent Organic Pollutants Regulation, enhancing protections for human health and the environment. The new rules propose phased reductions in residual limits for these substances in recycled-material products, particularly targeting toys, childcare articles, and household items made from recycled materials.

China water rules change

While in China, the local standard Water Pollutant Discharge Standard for Chemical Industrial Parks in Sichuan Province has become China's first local regulation specifically setting PFOA and PFOS discharge limits for chemical parks. It marks a critical step for Sichuan in controlling emerging pollutants and safeguarding water environment security in the upper reaches of the Yangtze and Yellow Rivers.



Chemicals re-emerging from the past

The risk of dangerous, long-banned chemicals re-entering the environment through contaminated rivers, soil, and food systems is heightening as global warming increases the number of severe weather events.

Floods are now remobilising chemicals and other hazardous pollutants once thought safely buried and dormant, creating new threats for human health and ecosystems. A recent UN report points out that many of the

chemicals at risk of resurfacing were banned decades ago due to their toxicity, but they remain in the environment. Floods can bring such chemicals to the surface, after having accumulated in the sediment over centuries. As floodwaters stir up contaminated sediment and debris, toxic substances may be released and spread across agricultural lands, urban areas, and freshwater sources.

The mass of the cryosphere – glaciers, seasonal snow, sea ice,

permafrost and related frozen systems – is expected to decline sharply if global temperatures rise more than 2°C above pre-industrial levels. That shift could also awaken ancient bacteria and

viruses, raising concerns about antimicrobial resistance.

Another rising concern is the risk posed by aging dams, especially for indigenous and fishing-dependent communities; dam removal may become a necessary strategy in some cases.

Many banned or phased out substances have been buried in low-lying bottom sediments – in rivers, landfills, contaminated sites – where high concentrations still exist. These substances do not disappear, they are persistent, non-degrading, and they are bio-accumulative, so they concentrate up the food chain. Floods can remobilise these old stores of harmful chemicals; they become part of the water body again and potentially enter wildlife and human systems.

Low-lying settlements along rivers and coastlines (home to large populations) are especially vulnerable. More and more people live in flood-prone areas. Floods can cause banned chemicals and toxic substances to mix with soil and water; as has been seen in recent disasters in India, Pakistan, and Texas.

The long-term effects of chemical pollution during clean-up and rebuilding are often overlooked; and policymakers often fail to factor this into water management and emergency planning. Industrial chemicals such as the polyesters used in electronics, as well as asbestos from storage sites, can be reintroduced into the environment by floodwaters.

Despite restrictions, these chemicals are still being detected in water systems, either from legacy contamination or ongoing industrial use. Some are endocrine disruptors or contain other toxic properties. The long-term risks could be catastrophic. Many countries lack effective early warning or



The Fox River dump exposure cost at least \$3 million to clean up, with trash tangled in the bush and strewn along kms of beach.



environmental monitoring systems. Although there might be a forecast or a warning sent out by the authorities, the capacity to monitor and respond is often not up to standard.

New Zealand is not immune from the risk identified in this UN report; such as witnessed by the flood crisis in the Nelson district this June/July, and the exposure of an old dump site by a flooded Fox River in South Westland. The ultimate concern in doing nothing is in terms of the potential cost to people, nature, and the economy.

– *Dave Lascelles*

UK proposing to 'lean' on foreign standards

The United Kingdom is proposing new legislation that will borrow or 'lean' on other countries' rulings.

The idea has just finished public consultation with experts questioning how to avoid dangerous substances being imported, manufactured and used domestically.

It has been suggested that a body of trusted foreign jurisdictions could be established, who have regulatory standards for biocides similar to, or at least as high as, the UK. The formation of such a protocol would streamline procedures.

The idea is part of UK's moves forward in its transition from the EU's regulatory framework on chemicals to establish its own regulations following Brexit.

The Chemical Business Association has emphasised it is very much for pragmatic reform.

Uncle Archie

Kia ora HS professionals!

The rise of AI

The human planet seems to have rapidly changed in the just 20 years with the advent of the internet, allowing each of us to almost see into others' lives, no matter what the distance. This has been enhanced by the rise of Artificial Intelligence technology, or AI, which can invent words or even pictures to state whatever it wants without editing. Those auto phone spelling changes of 'love it' to 'lost it' are a real worry!! Perhaps this reminds us of that ancient phrase "Truth, what is that?"

The Donald

Humans too have taken advantage of the internet domination such as one Donald Trump, who whether enacting big announcements or even being sued by his opponents, has hit the front pages of our news-sources on a daily basis, and through this fame in almost all of our lives has been re-elected US president. He is a stand-out, almost everyone on Earth has seen him, and as US president, past-president, media king, critic or just commentator, he is there alright!



Economic high-jumps

We learnt at our last encounter to expect the unexpected, and once again nothing is boring with the Donald in charge. This time he has decided to charge tariff taxes to everyone who may want to import goods to the USA. Within just six months of Donald rapidly changing his minds, the world markets have all Slopped, Dropped and Hopped and if we are hopeful, only the Donald knows where we are all heading next!

From a New Zealand perspective

we decided to remain quiet at our 10%, but in the past two months we have suddenly been raised from the suggested 10% to 15% tariff without any prior notification, wow!

Guidance suggestions for the enforcer

A 2024 MBIE workplace survey resulted in many respondents indicating Worksafe had created 'Fear' in the Workplace'. The Minister responded that perhaps a softer response with more 'guidance' would have greater benefit to lowering the high NZ workplace-related death rates.

Hazardous substance safety

guidance, as part of the compliance certification assessment process, has been found to reduce stress and promote use of PPEs and less occurrences of fire or toxic exposures. Previous data supplied from the EPA 2017 survey and from PCBU's who have had safety guidance as part of HS compliance certifiers assessment, has also indicated this is less stressful and the hazardous substance injury rates are much lower than the international averages where guidance has not been available.

Fragility of the internet

In recent times most humans seem to have a daily engagement with the internet. This has almost become a life necessity, but is being changed from wire-based to radio-wave based, which is easier and usually good. However, an accident on a recent Australian warship when it was visiting Wellington for a day managed to wipe out most of the Wellington internet for that day. This is a concern in that we do not want one of life's necessities to be cancelled at the accidental flick of a button!



NZ Institute of Hazardous Substances Management (Inc)

MEMBERSHIP APPLICATION FORM

1. **Name:**
First Name Surname
2. **Employment:**
Business/Employer's Name:

Position and Contact Details:

Position Held:

Qualifications:

Experience in HS:
.....
.....
.....

3. **Preferred mailing address:**

Telephone Contacts: (Bus)

Residential:

Mobile:

Email: Web:

4. I have previously been a member of the Institute: Yes..... No
If No, I am applying to be a

Member: ☐ Associate member: ☐

5. Return to: PO Box 10-385, The Terrace, Wellington
Email: office@nzihsm.org.nz

How did you find out about us?
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