CDOIF

Chemical and Downstream Oil Industries Forum

Good and Best Practice Update (G&BPU)

January 2026

Adapting to Climate Change

Supplement to

CDOIF Guideline – Adapting to climate change

Foreword

The CDOIF Guideline – Adapting to climate change was published in January 2024, along with a supporting slide pack and template guidance for trade bodies.

CDOIF recognises the pace at which climate change adaptation good and best practice, and climate impacts information is evolving. There have been several significant developments since publication of the original guideline. This Good and Best Practice Update (G&BPU) provides a signpost to those developments.

This G&BPU presents the updated information in two separate sections:

> Section 1 - Presents new and improving knowledge relevant to Natural Hazard Triggering Technological Accidents (Natech) risk management – information directly relevant to Control of Major Accident Hazards. Operators should review the information in this section, benchmark their operations against it and update their improvement plans and safety management systems as necessary, to ensure continual improvement in the control of Major Accident Hazards.
>
> Section 2 – Provides general updates relevant to wider business management systems and climate change adaptation. Operators could review this information since it may be relevant to COMAH. It will also likely be relevant to wider Health, Safety and Environmental Protection compliance, as well as general business sustainability, management strategy and practices.

Section 1 – New and improving knowledge in Natech risk management

Operators should review the information in this section, benchmark their operations against it and update their improvement plans and safety management systems as necessary, to ensure continual improvement in the control of Major Accident Hazards.

COMAH Competent Authority Natech and Adaptation Delivery Guide (DG)

- Operational Delivery Guide: Inspection of COMAH Operator Natech and climate change adaptation

The COMAH CA has provided guidance to regulatory field teams on targeting and prioritising Natech and adaptation themed interventions. The DG includes key expectations of operators, in particular linked to Safety Management Systems, to ensure continuing compliance with the COMAH regulations in a changing climate. Operators can usefully self-audit against this DG, irrespective of whether they are initially prioritised for an intervention by the CA. Any identified gaps in the measures necessary for prevention and mitigation of Major Accidents should be assessed and incorporated into improvement plans where necessary to ensure risks are maintained as low as reasonably practicable.

Climate Leadership

- OECD/European Union (2024), Managing Risks from Natural Hazards to Hazardous Installations (Natech): A Guide for Senior Leaders in Industry and Public Authorities, OECD Series on Chemical Accidents, OECD Publishing, Paris.

Leaders in industry and public authorities need to act to ensure the appropriate governance and management of Natech risk. The OECD/EU guidance is specifically aimed at supporting senior leaders set direction for implementing Natech prevention, preparedness and response measures. It will challenge senior leaders in industry and public authorities to consider questions such as:

- What should I do to ensure good governance of Natech risk?
- How do I gather and organise the capabilities and competences to do it?
- How do I ensure that my organisation continues to adapt to a changing environment?

This document will aid senior leaders to be able to self-assess how prepared their organisation is in managing Natech risks effectively. Section 8 provides self-assessment checklists for senior leaders in both industry and public authorities to help them to evaluate how well they are including Natech risk as part of their organisation's risk management processes.

Government green book supplementary guidance (2025)

- Green Book supplementary guidance: climate change and environmental valuation - GOV.UK

All Measures Necessary and Best Available Technique decisions, in some cases, require Cost Benefit Analysis (CBA) to assess the costs and benefits of safety and environmental protection measures, and the approach to doing this has been aligned with the HM Treasury's Green Book guidance. The Green Book provides a framework for government appraisal and evaluation, including the use of CBA to assess the impacts of different policy options. For COMAH, the CA's application of CBA aims to demonstrate that safety and environmental protection measures are "as low as reasonably practicable" (ALARP).

The revised Green book supplementary guidance: climate change and environmental valuation helps ensure that policies, programmes, and projects are resilient to climate change. It builds on the conventional Green Book appraisal methodology to account for climate effects, supports the identification of climate risks, and aids in designing and appraising adaptation measures. Where operators are reliant on CBA to justify grossly disproportionate costs within ALARP demonstrations, and there are climate relevant factors that may influence the CBA (such as increasing frequency of external / natural hazards) then operators should review this guidance and incorporate relevant good practices.

Met Office Weather warnings (see also new flood risk information below)

Meteorological organisations around the world are continuously improving accuracy and approaches to communication of weather forecasting, in order to improve severe weather warning systems. The UK Met Office has explained that it continuously evolves and improves the quality and delivery of Met Office weather warnings, as they are essential for protecting life and property in the UK. Met Office now provides UK weather warnings for rain, thunderstorms, wind, snow, lightning, ice, extreme heat and fog.

Discussions within the COMAH Strategic Forum emergency planning and adaptation working groups have highlighted that, to benefit from early warnings of extreme weather events or other Natech threats (e.g. increased wildfire risk or drought), operators need to assess risks, receive and recognise relevant warnings and plan and exercise the actions to be taken when extreme conditions are forecast. Operators should be aware of the available flood, weather and other relevant warnings and plan to take appropriate action when warnings are issued, so that they can be prepared and not leave action for when extreme weather arrives.

Operators should ensure:

- Foreseeable climate impacts have been identified and assessed to evaluate their influence on Major Accident Scenarios at the establishment, including

climate impacts. Where a risk assessment for a Natech event has previously been carried out (e.g. flood or lightning risk) then the assessment and its information should be periodically reviewed by the operator to ensure the assumptions remain valid given climate change and any emerging climate impacts information (threats and risks may have increased). This should include assessment of impacts on emergency plans and measures to mitigate risks through emergency response.

- Emergency planners should have received Natech risk assessment information, including information outlining any changes due to climate impacts. This information should be kept up to date as new climate information emerges.
- Natural hazard major accident scenarios should have been considered in emergency plans, and these should include cascading impacts/external threats to safety, environmental protection and the functioning of the plans (e.g. could flooding impact site access for emergency services or staff emergency responders or could wildfire or drought conditions reduce Fire & Rescue Service response capacity? Could the Natech event cause wide area power or communications disruption? What contingencies are necessary?)
- The business (via its management systems as opposed to individual staff members), should be signed up to receive warnings from organisations such as Met Office, Environment Agency and Highways Agency (for chemicals logistics information).
- Procedures for receipt of and action to be taken when warnings are issued (such as extreme weather, flood or increased wildfire risk), should be incorporated into emergency plans, including who will receive warnings and the actions to be taken to maintain safety before and as the extreme weather event impacts.
- Emergency plans (internal and external) should be exercised around the specific natural hazards that may cause or escalate Major Accidents at the establishment.

Flood risk in England

- New national flood and coastal erosion risk information - GOV.UK
- National assessment of flood and coastal erosion risk in England 2024 (NaFRA2)

Understanding of current and future flood and coastal erosion risk is vital to ensuring that policy makers, practitioners and communities are ready to adapt to a changing climate.

The Environment Agency (EA) has built a new National Flood Risk Assessment (NaFRA2). It provides a single picture of current and future flood risk from rivers, the sea and surface water for England. The last full update to NaFRA was in 2018. It uses the best available data both from the Environment Agency and local authorities. EA's new data on depth of flooding also provides more information to help people understand the potential flood hazard they could face.

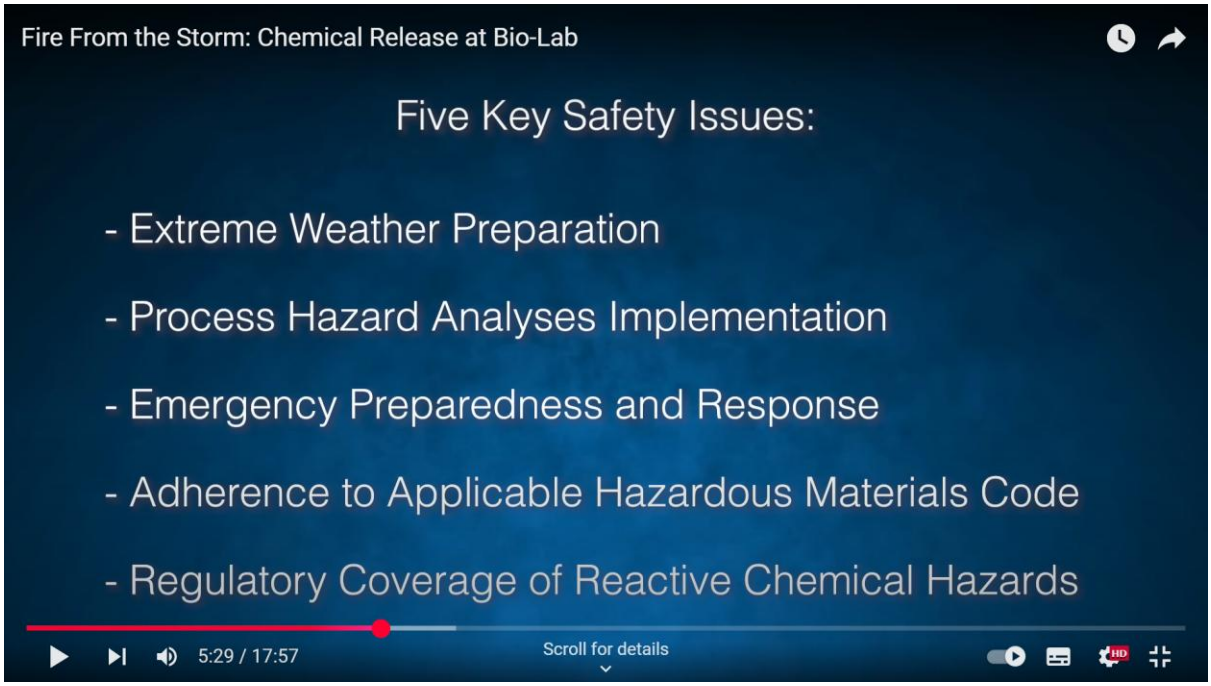
Alongside this, EA has also updated the National Coastal Erosion Risk Map (NCERM). The last update to NCERM was in 2017. The new NCERM provides the most up to date national picture of current and future coastal erosion risk for England. It uses the best available evidence from the National Network of Regional Coastal Monitoring Programmes.

For the first time, both NaFRA and NCERM account for the latest UK Climate Projections (UKCP18) and the potential impact of climate change on flood and coastal erosion risk.

US CSB – Biolab fire

US CSB have released a safety video on the investigation and recommendations arising from the August 2020 fire and toxic gas release at the Bio-Lab Lake Charles chemical facility in Westlake, Louisiana, that occurred when the facility was severely damaged by Hurricane Laura. Whilst UK establishments are unlikely to experience Hurricane conditions as severe as found in US, the combination of wind damage to property and rain impact on water reactive chemicals is very pertinent given the predicted increasing storminess, with increasing rainfall intensity, expected in UK with climate change.

> *"Companies and regulators must take steps to ensure that chemical facilities are protected against damage from Natural Hazards as extreme weather is becoming more common"*
>
> *US CSB (2025)*



The full report and recommendations can be found at [Bio-Lab Lake Charles Chemical Fire and Release | CSB]

Section 2 - General updates relevant to wider business management systems, Natech and climate change adaptation

Operators could review the information in this section, since it may be relevant to COMAH. It will also likely be relevant to informing continual improvement in wider Health, Safety and Environmental compliance, as well as general business management strategy and practices.

Management Systems

In February 2024, ISO revised all management systems standards to include explicit reference of the need to consider climate change and it's effects on the delivery of the outcomes of a wide range of management systems (including quality, safety and environmental). The following links provide more detail.

- Microsoft Word - Joint ISO-IAF Communique re Climate Change Amds to ISO MSS Feb 2024 Final.docx
- APG Auditing Climate Change issues FINAL 3-19-2024 Rev 1.pdf

Two further guidelines are in preparation

- ISO/CD 14002-3.2 - Environmental management systems — Guidelines for using ISO 14001 to address environmental aspects and conditions within an environmental topic area — Part 3: Climate
- ISO/AWI PAS 45007 - Occupational Health and Safety Management – OH&S risks arising from climate change and climate action — Guidelines for organizations

It is CDOIF's opinion that the requirements and guidance of ISO are aligned and complimentary to the content of CDOIF Guideline – Adapting to climate change, so whilst there will likely be additional detail useful for businesses to consider, the approaches outlined by CDOIF remain as current good and best practice. Indeed, the CDOIF guideline has been found to usefully support businesses to understand how they can embed climate change adaptation into all their management systems.

Review of activities regulated by the Environment Agency in 2023-24 and 2024-25

- EA Chief Regulator's Report 2023-24 and 2024-25

The Environment Agency Chief Regulator's report provides an insightful overview of regulation across the broad remit of environmental legislation. A strong theme running throughout is climate change, both from Net Zero and climate change adaptation perspectives. The 2023-24 evidence annex in particular provides a summary of the findings from regulator questionnaires issued to operators to explore levels or preparedness and commitment to build climate resilience. The report summarises findings from a recent EPR and COMAH questionnaire, which gathered information from over 1,600 EPR and COMAH operators and found:

- two-thirds of operators have committed to embed adaptation into their management systems, with top management oversight
- operators recognise that a wide range of climate impacts can threaten safety and environmental performance
- only a quarter of operators had benchmarked and were improving in line with adaptation standards and guidance
- while many operators manage present day impacts, not all are prepared for extremes, and only a few assess risks that will increase in the future
- there is a lack of adaptive capacity amongst the sectors we regulate and a lack of implementation of adaption action, some of which can be relatively low cost

The report provides an example of one low cost measure to improve preparedness - testing and improving extreme weather emergency plans.

The EA (along with all CA partners) will continue their informing and enabling approach to adaptation aspects of their regulatory activities, carrying out adaptation-focused inspections and audits.

ONR Chief Nuclear Inspector's themed inspection – climate change (2023-25)

- Climate change report highlights more work required by industry | Office for Nuclear Regulation

The Chief Nuclear Inspector's (CNI) Themed Inspection report on climate change, from the Office for Nuclear Regulation (ONR), concluded a two year targeted regulatory focus on the topic of climate change. ONR worked collaboratively with environment agencies, key industry stakeholders and international parties throughout the themed inspection process, maximising shared learning and identifying opportunities for enhanced cooperation.

ONR formally outlined the findings and its expectations to the nuclear industry and will continue targeted regulatory activities, working with industry to ensure this is done efficiently and effectively. The summary report also includes, at section 5, a summary of the Environment Agency findings from these inspections.

On launch of the report, Mark Foy, ONR's outgoing Chief Executive and Chief Nuclear Inspector, said: "This themed inspection was commissioned in response to scientific evidence that the UK climate may be changing at a faster rate than anticipated.

"As regulators, we consider climate change challenges a vital area of focus for the entire sector. Therefore, the themed inspection was a key element of our wider strategy of influencing improvements against our regulatory priorities.

"We found that industry is making progress and we didn't identify fundamental shortfalls in current robustness against external hazards. However, there is still work required by dutyholders to implement adequate arrangements ensuring sites remain resilient against future climate change effects in the medium and long-term."

Reports from the 4th Round of reporting under the Climate Change Act

Many organisations have provided reports to DEFRA detailing the measures they are taking to maintain delivery of their core functions in the face of climate change, today, mid-century and to the end of the century and beyond. Reports, which provide extensive detail on adaptation measures to build resilience, can be found at Climate change adaptation reporting: fourth round reports - GOV.UK

Reports are also available from regulators, which detail approaches they are taking to both build their own resilience and ensure those they regulate build resilience to maintain compliance and key service delivery.

- Environment Agency climate adaptation reporting fourth round: climate resilience for a better environment - GOV.UK
- ONR's response to the fourth round of climate adaptation reporting in accordance with the Adaptation Reporting Power (ARP) | Office for Nuclear Regulation

The guidance to reporting authorities may be helpful to wider organisations, since it outlines government expectations on topics such as carrying out a risk assessment, climate scenarios, risk management, action plans and implementation, governance and monitoring and evaluation.

- Climate change adaptation reporting – fourth round guidance summary - GOV.UK

Marsh 100 Largest Losses (2024)

- 100 largest losses in the hydrocarbon industry report 2024

In their latest report, Marsh Speciality highlights that climate-induced losses are already material events forcing organizations to develop new strategies and adapt

business models to protect their assets and balance sheets. They provide a detailed focus on climate risk, resilience and adaptation, highlighting that the reality of climate change means companies have to rethink their infrastructure needs and design. Increasing variability in weather conditions and more frequent natural catastrophe hazards increase the risk exposure of most energy facilities.

EA industrial clusters work (2025)

- Environmental capacity for industrial clusters - GOV.UK

Reports from an investigation into the environmental capacity for deploying carbon capture and hydrogen production decarbonisation technology in key English industrial clusters. These documents present findings of government sponsored work by the Environment Agency (EA) to investigate the environmental capacity for deploying carbon capture and hydrogen production technology in key English industrial clusters.

They include:

- a snapshot view of industry plans at a cluster level
- a full review of evidence on water availability and quality and air quality
- a partial review of the risk of flooding
- impacts that deployment may have on the receiving environment, including habitats
- consideration of how these factors will be influenced by a changing climate

Understanding of compound risks

- Compound climate events are on the rise. It's time for action | PreventionWeb

As the frequency of extreme weather events and their impacts increases, awareness of compound risk is growing. Compound events - where two or more hazards, such as heatwaves and floods, occur simultaneously or in close succession - are becoming more common. This phenomenon often results in more severe negative outcomes than if each hazard were to occur separately. In the UK we have recently seen the increased impacts from named storms occurring in rapid succession (equipment damaged in the first storm is more vulnerable to successive storms if not repaired in time or if storm debris is not secured). Another example is that there is an increased risk of flooding due to intense rainfall landing on baked summer ground, which limits infiltration and increases runoff, so flooding can often be exacerbated during prolonged dry weather episodes. Compound events are often not independent – for example, see the EA's special issue of IChemE's Loss Prevention Bulletin – Case study 2 summarises the CSG Sandhurst incident (2000) when a fire occurred during a storm (whilst immediate cause was never identified, two theories include possibility of wind toppling of containers and subsequent chemical mixing/reactions, or ignition by

lightning). Days later the fire damaged site was impacted by river flooding (a slow onset event linked to the storm) which greatly increased the risks to people and the environment and the complexities of the recovery activities.

From a process safety perspective, risk assessors should pay particular attention to common cause failures across a site and associated wide area impacts (e.g. loss of utilities) which may further exacerbate risks. In addition, there is a need to take care not to dismiss the simultaneous occurrence of two or more low frequency events, when in fact they are not independent. In CDOIF Guideline – Adapting to climate change we highlighted

> "The risk assessment procedure should facilitate a whole system approach. Within Natech hazards, common cause failures may occur that impact more than one plant area and multiple natural causes (wind, flood, lightning etc) can impact simultaneously."

Further guidance on evaluating impact chains, the interdependencies between impact chains and system risk can be found in ISO 14091 "Adaptation to climate change – Guidelines on vulnerability, impacts and risk assessment".

Process Safety Management Competencies Programme Board (PSMCPB)

Following successful development of Process Safety Leadership and Management training standards, the PSMCPB is now developing new training standards, focusing on the skills and capabilities required to build climate resilience.

The first standard will focus on "Climate Resilience Leadership for Senior Objectives". It is anticipated to be launched early in 2026 with the following learning objectives:

The senior management / executive learner will be able to understand:

1. The business case for climate resilience leadership
2. Understanding the concepts of natural hazards and climate change
3. The threats, hazards, risks and consequences posed by climate change both now and into the future
4. Adaptive capacity and its barriers/enablers to risk management
5. How climate change impacts their business and how to manage it
6. The standards and regulations that govern climate change resilience
7. How to prepare their business for climate change.
8. How to embed climate adaptation into their existing management systems to build resilience