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G+ safe by design framework

First edition

G+ Global Offshore Wind
Health & Safety
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EI 3616

G+ SAFE BY DESIGN FRAMEWORK

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CONTENTS

Page

LIST OF FIGURE AND TABLES

Page

Figure

Tables

1 INTRODUCTION

Safe by Design (SbD) in offshore wind (OSW) is a proactive, preventative approach that aims to mitigate and, where possible, eliminate health and safety risks during the design, specification and construction stage of an offshore wind farm. It is rooted in the principle that many operational risks can be significantly reduced, or even designed out entirely, through better-informed design decisions that consider how equipment and systems are built, installed, operated and maintained.

SbD also supports more efficient, cost-effective projects by reducing the need for retroactive fixes, workarounds or risk-mitigation measures introduced later in the development cycle. Better safety equals better business.

For more information on the SbD approach please read *Safe by design – Good practice guidelines for the offshore wind industry*.

The G+ Global Offshore Wind Health and Safety Organisation (G+) has been applying the SbD philosophy and using it as a foundation for collaborative industry workshops, guidance documents and targeted improvement recommendations. This framework formalises that approach and sets out how SbD will be further developed, applied and promoted across the offshore wind sector.

The aims of the SbD Framework are to:

a) **Identify critical and emerging design topics** using incident data, operational feedback and trends in technology and practice.

b) **Deliver structured, collaborative workshops** to explore design-related safety challenges and generate practical improvement recommendations.

c) **Produce and disseminate guidance** that supports the application of SbD principles throughout the project and asset lifecycle.

d) **Clarify how organisations and designers should engage with SbD outputs**, including the prioritisation and application of recommendations.

e) **Promote consistency, influence and alignment** across industry practices, including links to standards, procurement and design reviews.

f) **Review SbD design recommendations** to see how they are being used throughout the industry and where work is still needed.

By defining these aims, this framework provides a reference point against which future SbD activities and outputs can be assessed, ensuring they remain focused, transparent and impactful across the global offshore wind sector.

This framework also clarifies how organisations across the offshore wind supply chain should engage with SbD outputs, whether through incorporating recommendations into internal processes, using them to inform procurement or applying them as good practice in design reviews.

While SbD recommendations are not formal industry requirements, they are collectively defined and prioritised by industry experts and are intended to complement standards, address gaps in design thinking and ultimately lead to safer and more efficient offshore wind operations.

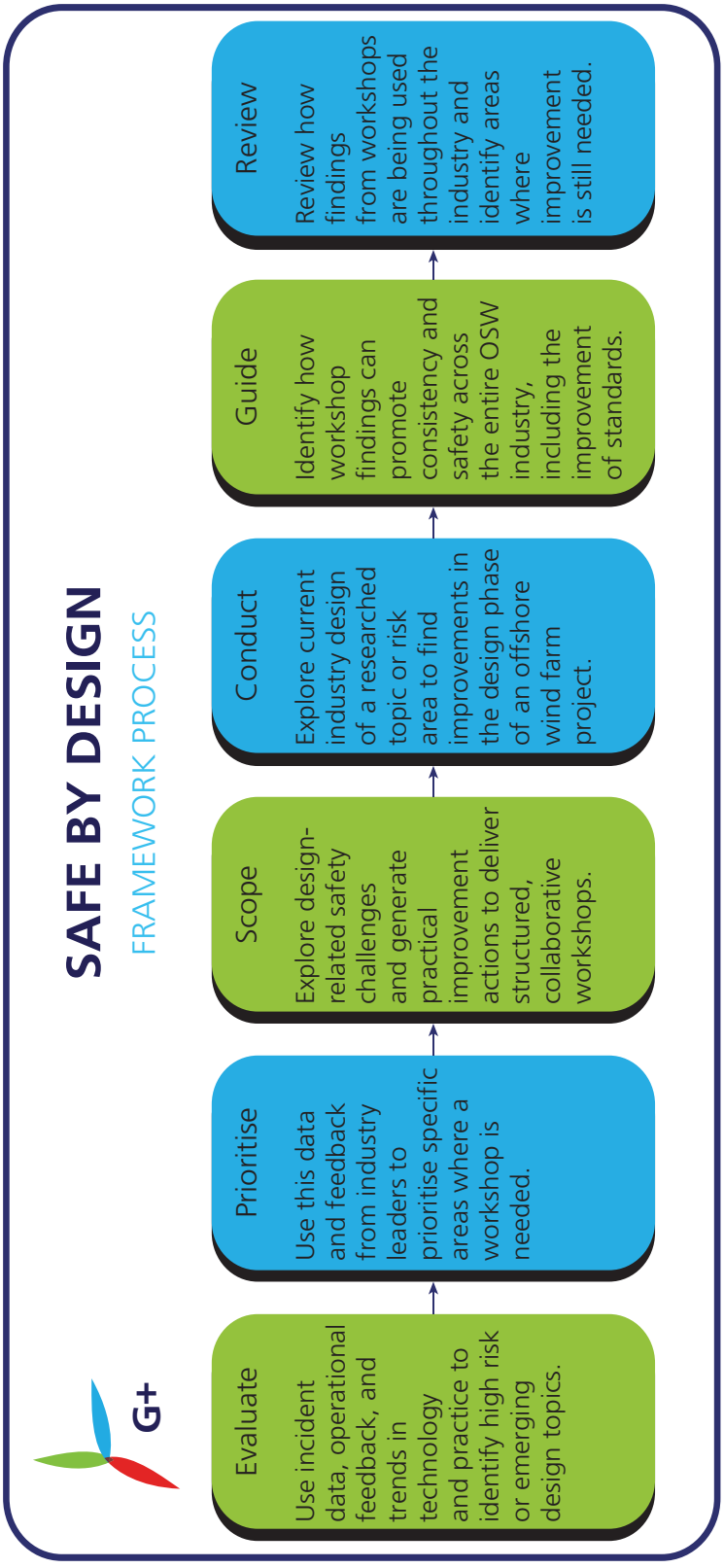

Figure 1: Safe by design framework process

2 PURPOSE

The purpose of the G+ SbD Framework is to provide a systematic and objective framework to identify, prioritise and respond to emerging safe by design industry challenges using incident data, operational feedback and trends in technology and practice. The SbD Framework is intended to be used by the G+ SbD workgroup to produce guidance and other recommendations that support developers improve SbD practices across the industry.

3 BACKGROUND

3.1 IDENTIFYING SBD TOPICS

The selection of SbD focus areas is informed by a combination of evidence-based insight and forward-looking industry developments. G+ identifies potential topics through analysis of incident and near-miss data, emerging trends from the G+ incident data reports and feedback from frontline personnel, member companies, regulators and applicable technical standards. The potential topics are prioritised and selected by the G+ SbD workgroup, comprised of representatives from the G+ member and associate companies. Attention is given to areas where design decisions have a considerable influence on operational safety and where recurrent issues suggest systemic design-related causes.

In addition to historical data, SbD topics may also be driven by the introduction of new or evolving technologies, such as floating wind platforms, autonomous systems or novel access solutions, where standards and industry practices are still maturing. The process is collaborative and dynamic, with topic prioritisation informed by a combination of risk potential, stakeholder input and opportunities for industry-wide improvement. The topics are normally globally applicable.

3.1.1 Prioritisation method

To ensure SbD focus areas are selected in a consistent, transparent and evidence-led way, G+ will apply a structured topic prioritisation method. This supports objective decision-making, provides clear oversight for the G+ board and establishes a defensible rationale for topic selection. Potential SbD topics will be assessed against agreed prioritisation criteria, including incident learning, regulatory attention, technology maturity and the potential to influence industry standards (among others). Each criterion will be scored on a defined numerical scale and weighted according to its importance.

The criteria, scoring definitions and weighting will be agreed, with weighted scores generating a ranked list of candidate topics which form a prioritised backlog of SbD focus areas. The G+ SbD workgroup will review and update this list annually, with final approval by the G+ board, via the G+ focal groups. A summary of outcomes, including possible topics and reasons for deferral, will be produced to support transparency and continuity.

Table 1: Prioritisation scoring methodology

Criterion	Weight	Description	Example measures (data sources)
Incident burden (severity × frequency trend)	25 %	Harm potential and recurrence strength	G+ incident and near-miss trend analysis, severity matrix, regression on 3-year trend
Regulatory and public scrutiny	15 %	Current/expected attention or gaps	Regulator alerts, notices, consultations, EI technical work signals

Table 1: Prioritisation scoring methodology (continued)

Technology maturity and novelty	15 %	Technology readiness level (TRL), novelty-induced interface risks (e.g., floating, robotics, hydrogen integration)	TRL scoring, interface hazard inventory, systemisation risks per GPG section 5.8
Lifecycle criticality	10 %	Number/ complexity of affected lifecycle tasks	GPG lifecycle map (dev/design/ construct/ops/decom) exposure count
Cross-package interface risk	10 %	Likelihood hazards emerge at interfaces	Interface map complexity, prior deviations, lessons learned
Global/ country applicability	10 %	Breadth of geographic/ regulatory relevance	Markets impacted (EU/UK/US/Asia), local codes delta
Closing standards gap	10 %	Feasibility to influence near-term revisions	Active committees, revision cycles, G+ liaison leverage
Time-to-impact	5 %	Speed G+ can deliver risk reduction	Availability of design levers, procurement hooks

3.2 G+ SBD WORKSHOPS AND ENGAGEMENT

SbD workshops are a core mechanism through which the G+ convenes a broad range of stakeholders to explore and improve design-related health and safety challenges in the offshore wind sector. Once a focus area is agreed by the G+ SbD workgroup, the scope is developed collaboratively between the G+ secretariat, relevant member companies and technical specialists, ensuring alignment with real-world risks and operational challenges. Sign-off and input is also required from the G+ focal groups and chapters.

Stakeholders are identified by the SbD workgroup, G+ focal groups, chapters, board and secretariat to ensure balanced representation, with participants typically including developers, original equipment manufacturers (OEMs), designers, contractors, health and safety (H&S) professionals, trade associations, regulators and frontline personnel. To enrich the process and avoid insularity, the G+ also seeks to supplement internal industry knowledge with external expertise where appropriate, for example, drawing lessons from high-risk energy industries (such as oil and gas or nuclear) or from adjacent sectors with relevant experience (e.g. marine decommissioning, robotics or heavy lifting).

Importantly, while engagement across the supply chain is vital, the role of the WTG operator as the custodian of system-level safety and design integrity must be emphasised. Operators hold overarching accountability for ensuring that SbD principles are embedded across project lifecycles, from concept development and procurement through to operations, maintenance and ultimately decommissioning. Their leadership in the SbD process is critical to ensuring that design outcomes reflect not only contractual requirements but also long-term safety, maintainability and operational practicality.

The G+ has held nine SbD workshops over the past decade, as well as one in collaboration with International Marine Contractors Association (IMCA). The reports from the workshops are available here. SafetyOn, the onshore wind industry equivalent to G+ in the UK and Ireland, has also held workshops and those reports are here.

The purpose of each workshop is to explore the current industry design of a particular topic or risk area and to investigate improvements in the design phase of an offshore wind farm project. The recommendations suggested at the workshops help to reduce the number of incidents, improve efficiency and aid the sector's overall health and safety performance both at the initial design level and through retrofit campaigns for already operational sites. The outputs of SbD workshops are intended to generate tangible, structured recommendations that can inform safer and more effective offshore wind project design. To date, the quality and impact of workshop recommendations have varied. This framework sets out a clearer expectation of what constitutes a strong, actionable outcome.

SbD workshop outputs should be captured in a structured report format and categorised into one or more of the following areas:

a) **Further development or research required:** Where knowledge gaps or new technical challenges are identified, the recommendation should highlight the need for follow-on work. This could include feasibility studies, academic collaboration, funding proposals or the formation of joint industry projects (JIPs). Emerging technology needs may also be captured here.

b) **Direct design recommendations:** These are practical and tangible recommendations for designers to address. They may include changes to equipment layout, access arrangements, handling interfaces or integration requirements. While G+ SbD guidance is not legally binding, these recommendations should be given meaningful weight during design development, particularly where risks are well evidenced. Active involvement of representatives from standards bodies in SbD workshops is strongly recommended to ensure alignment with existing standards and to potentially shape future standardisation efforts.

c) **Information flows and communication mechanisms:** Some outputs relate to how design information is created, transferred or reviewed. This includes recommendations on how to better integrate operational knowledge into design phases, communicate training gaps to training standard bodies, ensure feedback loops exist between teams or improve industry-wide communication of lessons learned.

Collectively, these categories help ensure that workshop outcomes are not vague or overly conceptual but instead serve as a basis for continued design iteration, industry collaboration and targeted improvement. Where appropriate, outputs may inform the development of G+ Good Practice Guidelines (GPGs). While GPGs do not carry the force of regulation, they represent sector-agreed recommendations and are viewed by regulators and developers as a benchmark for good design practice.

The G+ will ensure that the recommendations from the SbD report are implemented as part of the SbD work programme or other relevant workstreams. The G+ will also continue to review and update the SbD report as required.

3.2.1 Roles and responsibilities

To support the effective delivery of SbD workshops and ensure clear accountability for workshop outputs, a RACI matrix has been developed. The matrix sets out the respective roles of the G+ secretariat, SbD workgroup, focal groups, chapters, member companies and other stakeholders across the SbD process, from topic selection and workshop delivery through to reporting, follow-up and implementation. By clarifying who is **responsible, accountable, consulted** and **informed** at each stage, the RACI helps promote consistency, transparency and timely decision-making across the SbD work programme.

Table 2: RACI matrix

Activity/ Stage	G+ secretariat	SbD workgroup	G+ focal groups and chapters	G+ board	Member companies	Technical/ external experts
Identify and agree SbD focus area	R	A	C	I	C	I
Develop workshop scope and objectives	R	A	C	I	C	C
Identify and engage stakeholders	R	A	C	I	C	I
Deliver SbD workshop	R	A	C	I	C	R
Provide technical input and challenge	I	C	C	I	C	R
Capture and develop workshop outputs and report	R	A	C	I	C	C
Review and sign-off SbD report	R	A	C	I	I	I

Table 2: RACI matrix (continued)

Integrate and monitor recommen-dations within SbD work programme	R	A	C	I	C	I
Inform G+ Good Practice Guidelines (where applicable)	R	A	C	I	C	C

3.2.2 Stage-gated SbD pipeline

The SbD Framework operates through a structured stage-gated pipeline to ensure that topics are progressed in a controlled and transparent manner. Each stage of the pipeline has defined objectives, requirements and decision points.

The stages of the pipeline are as follows:

- Evaluate: Topic nomination, supported by incident trends, operational feedback and preliminary standards mapping
- Prioritise: Application of the SbD prioritisation matrix to create a ranked backlog and proposed portfolio of topics.
- Scope: Development of a clear design brief defining the problem statement, scope boundaries, objectives and success criteria.
- Conduct: Delivery of the SbD workshop using standardised methods, inputs and facilitation.
- Guide: Conversion of workshop outputs into draft guidance, addenda or revisions, including editorial and peer review.
- Review: Monitoring of adoption, assurance activities and identification of follow-up actions or further work.

Progression through each gate requires completion of the tasks and confirmation by the working group, as defined in the SbD governance model.

3.2.3 Workshop artefacts and service levels

To improve consistency, quality and traceability, all SbD workstreams will be supported by a standard set of inputs, outputs and indicative service level timelines.

Standard workshop inputs include:

- A scoping note defining the topic, objectives, boundaries and intended outcomes.
- Relevant anonymised incident and near-miss data.
- A preliminary map of applicable standards and guidance.

– A stakeholder and participant matrix to ensure balanced representation across the supply chain.

Workshop outputs will be structured in line with the categories described in this framework and will include:

– Clearly defined recommendations.
– Named owners or responsible stakeholder groups.
– Indicative timescales
– A defined test of indicator for adoption.

Where workshops produce direct design recommendations, an agreed action plan will be developed to support progression into guidance or further workstreams.

Indicative service level timelines are as follows:

– Draft workshop report within 30 days of workshop conclusion.
– Completion of peer/group review process within 60 days.
– Publication or progression decision within a further 30 days.

These timelines are indicative and can be adjusted based on topic complexity and output density.

3.3 G+ SBD GPG

The G+ publishes guidance, intended to be applied by relevant stakeholders, to improve global health and safety standards in the offshore wind industry. The *Safe by Design – Good practice guidelines for the offshore wind industry* was developed to help the sector apply SbD principles across the full project lifecycle, with the aim of improving health and safety outcomes as early as possible in the lifecycle.

As part of the G+ review of GPGs, SbD workshop outputs are also intended to inform the development and evolution of other GPGs. To ensure clarity and consistency, workshop outputs will be progressed through one of the following publication routes:

– Development of a GPG addendum addressing a specific topic or risk area relevant to a specific GPG;
– Revision and updating of GPGS where SbD workshops bring up additional information, standards or recommendations that are relevant; and/or
– Development of a standalone GPG if the findings from the workshop report are extensive and far reaching.

The appropriate route will be determined based on the scope, maturity and impact of the workshop outputs. Editorial control, peer review, version management and publication processes will follow the Energy Institute's established publication protocols.

4 APPLYING SBD OUTPUTS AND DESIGNER ENGAGEMENT

The effective implementation of SbD outputs relies on a structured approach to ownership, prioritisation, and integration into project delivery. To support consistent application across the offshore wind sector, the framework establishes a clearer model for how recommendations should be framed, assigned and embedded within project and design processes.

4.1 CLEAR ASSIGNMENT OF RESPONSIBILITY

All SbD workshop outputs and guidance-derived recommendations should explicitly identify the relevant actionee(s), based on the type of recommendation. To ensure that recommendations are not lost or diluted, the G+ SbD workgroup and G+ secretariat will assign ownership for each action into one or more of the three categories mentioned in 3.2: *G+ SbD Workshops and engagement.* This categorisation ensures that all outputs are actionable and tied to an appropriate stakeholder group. Where a recommendation does not have a natural owner, the G+ secretariat will coordinate with the relevant organisations to provide further clarification.

4.2 EXPECTATIONS FOR INDUSTRY ENGAGEMENT

To achieve sector-wide consistency, G+ members and wider industry stakeholders should align on incorporating relevant SbD recommendations into internal processes and commercial arrangements. These outputs should not be viewed as optional. Failure to adopt or respond to clear SbD recommendations should be supported by documented justification. It is accepted that some developers may want to go above/beyond good practice. Developers, as custodians of system-level design, must take responsibility for ensuring that SbD principles are embedded across procurement, interface management, and project governance.

Developer oversight is particularly important in a project environment where design responsibilities are fragmented across multiple packages, joint venture arrangements and supply chain actors. Some safety issues emerge not from isolated design failings, but at the interface between packages, where assumptions and constraints are not effectively communicated or integrated. Therefore, the implementation of SbD must be considered at the system level, not just at individual component or package level. Ultimately the owner of the project has ultimate design responsibility.

4.3 INTEGRATION WITH DESIGN PROCESSES

Organisations should integrate SbD recommendations into:

a) Design stage risk assessments and hazard identification (HAZID) processes
b) Front-end engineering design (FEED) reviews
c) Procurement specifications and tender requirements
d) Design verification and interface management processes
e) Project phase gates and design freeze milestones
f) Project reviews and lessons learnt

In addition to embedding these recommendations in project-level tools, organisations should maintain a clear audit trail of how each relevant SbD output was considered, accepted or addressed. This supports continuous learning, knowledge retention and assurance.

4.4 ENGAGING IN THE DESIGN COMMUNITY

There are multiple teams and individuals that are involved in the specification, development, design, and engineering of offshore wind infrastructure. This includes, but is not limited to:

- WTG engineers
- Foundation, jacket, and transition piece designers
- Electrical and mechanical engineers
- Cabling engineers
- Marine access and vessel designers
- Operations and maintenance (O&M) facility and tooling designers
- OEM teams
- Engineering consultancies supporting developers or contractors

However, safety is not only embedded by the 'designer' in isolation, but also built through shared assumptions, alignment of constraints and the resolution of design interfaces. Accordingly, the application of SbD outputs must also involve procurement, interface managers and project leadership functions.

4.5 RAISING DESIGNER AWARENESS AND EMBEDDING TASK-BASED DESIGN PROCESSES

While raising awareness among designers is important, particularly around operational realities such as personnel transfers, lifting operations and access, the most effective means of improving safety outcomes lies in embedding structure and accountability within the design process itself. Many safety issues are not complex; they become apparent when designs are subjected to step-by-step task-based reviews. Therefore, a key component of this framework is to integrate a structured task-based analysis approach throughout the design process, allowing hazards to be identified and mitigated early before construction and installation. This could be through an operator's standard hazard identification/risk assessment process or through pre-production quality assurance.

Rather than relying solely on general awareness materials (e.g., videos or case studies), the framework emphasises the need to establish clear mechanisms for input into design from operational experts and end users, as well as systematic, multidisciplinary design reviews at key project stages. These reviews should focus on real operational tasks and be informed by lessons from incidents, G+ guidance and frontline experience.

To support ongoing designer development, G+ will explore options for creating continued professional development (CPD)-accredited materials, such as targeted webinars and design checklists (*Safe by design – Good practice guidelines for the offshore wind industry* section 12). This recognises that raising awareness is not a one-off effort, but an ongoing process tied to competency, experience and professional growth. Leveraging G+ and member company communication channels will help distribute this content, but engagement will be driven by embedding it into professional expectations, rather than passive consumption.

4.6 REFERENCING GUIDANCE IN PROCUREMENT CONTRACTS

Incorporating SbD principles into procurement contracts is essential for embedding health and safety considerations early in the design process; however, the current format of the SbD good practice guidelines (GPG) which often recommend further studies or industry collaboration, presents challenges for direct application. To address this, procurement contracts should reference the guidance as a source of design intent and risk awareness, requiring contractors and suppliers to demonstrate consideration of relevant SbD recommendations, even if not all are definitive. This could include a commitment to engage with ongoing JIPs, perform targeted design reviews based on identified risk areas or adopt interim best practices where applicable.

Contractual language should focus on promoting continuous improvement and evidence of SbD thinking rather than enforcing strict compliance with still-evolving recommendations. In addition, developers and procurement teams can include expectations for active participation in the industry dialogue (e.g. working groups or workshops) and require suppliers to document their engagement with the guidance and the rationale behind design decisions. By doing so, the sector acknowledges the developmental nature of the guidance while still driving safety outcomes through accountability and shared commitment.

4.7 GUIDANCE INTERACTION WITH SAFETY STANDARDS

Ensuring that G+ SbD guidance interacts with established safety standards, such as International Organization for Standardisation (ISO), Deutsches Institut für Normung (DIN), International Electrotechnical Commission (IEC) and European Norm (EN), is critical to aligning industry practice with recognised benchmarks while also identifying and addressing gaps in existing frameworks. In this context, 'interaction' refers to both referencing relevant standards within SbD guidance documents and using insights from SbD activities to influence and inform the future development of those standards. G+ guidance should help designers identify which standards apply to specific risk areas, while also highlighting where standards may fall short in addressing operational realities or emerging risks.

While referencing standards provides a consistent baseline, the SbD process often surfaces challenges that are not fully addressed by existing norms, underscoring the need for more practical, end-user-informed safety solutions. For example, in certain safety standards, limited industry engagement during development resulted in top-down requirements that may not fully reflect offshore wind operational contexts. G+ has a key role in helping close this gap by establishing formal mechanisms to connect SbD outputs to standardisation efforts. This could include:

- **Creating a dedicated liaison process** with relevant standards bodies (e.g. ISO, IEC, CENELEC, BSI) to provide regular briefings and structured summaries of SbD findings that highlight practical gaps or misalignments in existing standards.
- **Nomination of technical experts from G+ member companies** to participate in key standards committees and working groups, ensuring offshore wind-specific operational insights are represented during standards development.
- **Developing an annual 'Design Safety Gap Review' report**, drawing on SbD workshop outcomes, incident data and practitioner feedback to formally identify areas where standards do not adequately address offshore wind safety risks. This report could then be published by the G+, and the relevant regulators or standards development organisations would be notified.

– **Hosting cross-industry technical roundtables or webinars** with designers, OEMs, operators and standards bodies to validate findings and discuss how SbD lessons can be operationalised within future revisions of key safety codes.

These activities aim to make the SbD guidance more than just a reference tool, transforming it into an influential driver for systemic safety improvements through industry collaboration and standards evolution.

While referencing standards within SbD guidance helps ground recommendations, the aim is not to rely on them uncritically. Instead, the G+ should promote a balanced approach where standards are seen as a baseline, and SbD is used to push the boundaries of what is practical, safe and future-ready, particularly where real-world conditions or innovative technologies are not yet well addressed in formal codes.

To support effective engagement with standards bodies, G+ will contact priority standard organisations and maintain a forward programme of engagement. Insights from SbD workshops and guidance development will be consolidated through a periodic *Design Safety Standards Gap Review*, providing a structured mechanism to identify gaps, inform engagement priorities and track influence on external standards over time.

4.8 DESIGNER AWARENESS WORKSHOPS

When new G+ SbD guidance is launched, hosting an awareness workshop for designers ensures effective dissemination and understanding of key safety principles. These workshops should bring together offshore wind developers, OEMs, engineering procurement and construction (EPC) contractors, design engineers and H&S professionals to discuss how the guidance applies to offshore wind projects. The sessions should cover the rationale behind the guidance, lessons learned from industry incidents and practical applications in design processes.

Interactive discussions, case studies and question and answer (Q&A) sessions can help designers identify how to integrate SbD principles into their workflows. Additionally, providing supplementary materials, such as implementation checklists (*Safe by design – Good practice guidelines for the offshore wind industry* section 12) and recorded sessions, ensures ongoing accessibility to the guidance. By fostering early engagement and knowledge-sharing, these workshops will help drive industry-wide adoption of safer design practices, reducing risks and improving long-term health and safety performance in offshore wind projects.

4.9 DESIGNER ENGAGEMENT

Engaging designers from the outset of guidance development ensures that SbD principles are practical, relevant and effectively integrated into offshore wind projects. Involving the appropriate designers early in the process allows for valuable industry insights, helping to identify design challenges, potential safety risks and opportunities for innovation. This collaboration can be facilitated through workshops, technical working groups and consultation sessions where designers contribute their expertise to shape guidance that is both technically feasible and safety focused. Early engagement also promotes a sense of ownership among designers, increasing the likelihood of successful adoption and implementation. By embedding SbD thinking at the start of the guidance production process, the offshore wind industry can develop more effective, user-driven safety recommendations that drive continuous improvement in health and safety performance.

4.10 ADOPTION ASSURANCE AND METRICS

To ensure that the SbD outputs lead to meaningful improvements in industry practice, adoption should be evidenced rather than assumed. The application of SbD recommendations will therefore be supported by defined assurance and reporting mechanisms.

– Member self-assessment against the G+ SbD GPG implementation checklist.
– Demonstration of how relevant SbD outputs have been considered of referenced within procurement specifications and contractual arrangements.
– Inclusion of SbD considerations within project level design assurance, risk management and review processes.

The G+ secretariat will aggregate and anonymise adoption information, providing periodic summaries to the G+ board to support oversight, learning and continuous improvement.

5 CONCLUSION

By leveraging incident data and operational feedback, this framework ensures that risks are not only identified but mitigated or eliminated during the earliest stages of project development. Through workshops, clear ownership of recommendations, integration into design processes and active engagement with designers, operators and standards bodies, the framework translates lessons learned into practical improvements that enhance both safety and efficiency. Crucially, it recognises that operational safety is best achieved when the whole supply chain takes shared responsibility for safe outcomes.

By formalising this approach, the G+ can strengthen consistency across the industry and promote alignment with international standards. SbD is a practical tool that ensures offshore wind projects are safer, more reliable and more cost-effective. Through ongoing collaboration and commitment, the framework will continue to shape safer design practices and deliver long-term benefits for workers and the wider energy transition.

ANNEX A GLOSSARY

A.1 GLOSSARY

Table A.1: Glossary of terms

Front-end engineering design (FEED)	A preliminary engineering phase that defines the scope, cost and technical requirements of a project
Hazard identification (HAZID)	Process used early in a project to identify potential hazards that could affect people, the environment or assets
Joint industry projects (JIP)	A work programme of mutual interest to several organisations, each contributing to fund the work
RACI	A RACI matrix is a project management tool used to define and document roles and responsibilities for tasks and deliverables. It ensures clarity, prevents bottlenecks, and improves accountability by assigning roles: Responsible (does the work), Accountable (signs off, one per task), Consulted (provides input) and Informed (updated on progress)
System level design	The process of planning and outlining the high-level architecture of a system before implementation
Technology readiness level (TRL)	A 1-to-9 scale measuring a technology's maturity, from basic research (TRL 1) to proven operational use (TRL 9)

A.2 ABBREVIATIONS

Table A.2: List of abbreviations

BSI	British Standards Institution
CENELEC	European Committee for Electrotechnical Standards
CPD	Continuing professional development
DIN	Deutsches Institut für Normung (German Institute for Standardization)
EN	European (Norm/Standard) (Norme Européenne)
EPC	Engineering, procurement, construction
FEED	Front end engineering design

Table A.2: List of abbreviations (continued)

FG	Focal group
GPG	Good Practice Guide/Good Practice Guidelines
HAZID	Hazard identification
H&S	Health and safety
IMCA	International Marine Contractors Association
ISO	International Organisation for Standardisation
JIP	Joint industry project
O&M	Operation & maintenance
OEM	Original equipment manufacturer
OSW	Offshore wind
SbD	Safe by Design
WTG	Wind turbine generator

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