EI 3582

SafetyOn/G+

Workshops report: Electrical safe system of work

G+ Global Offshore Wind Health & Safety Organisation

SafetyOn

In partnership with

energy institute

SAFETYON/G+

WORKSHOPS REPORT: ELECTRICAL SAFE SYSTEM OF WORK

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CONTENTS

LIST OF TABLES

Page

Tables

ACKNOWLEDGEMENTS

SafetyOn is the health and safety (H&S) organisation for the onshore wind industry. Providing leadership in H&S for the onshore wind industry, SafetyOn ensures transparency about the industry's H&S performance, as well as assisting industry stakeholders to see that key emerging risks are mitigated through co-operation and shared learning.

G+ is the global H&S organisation, bringing together the offshore wind industry to pursue shared goals and outcomes. Together with lead operators and owners of offshore wind farms and wind turbine generator (WTG) original equipment manufacturers (OEMs) the G+ creates a safer and healthier global industry based on their data driven work programme.

Both organisations are run in partnership with the Energy Institute (EI), which provides the secretariat and supports its work.

SafetyOn, together with G+, maintains the Wind Turbine Safety Rules (WTSRs) through the WTSR Steering Committee , composed of board members from both organisations. The WTSR Steering Committee is responsible for governance and leadership. It focuses on developing a common understanding of good practices to manage the electrical and mechanical safety risks arising from planned and installed onshore and offshore wind installations, such as work undertaken by the Operational Safety Rules Group (OSRG). The Steering Committee will support the effective application of Safety rules across all organisations enabling a standardised approach.

EXECUTIVE SUMMARY

SafetyOn and G+ have been working collaboratively with the EI to enhance safety protocols in the onshore and offshore wind industry through the Safe System of Work (SSOW) workshops. These workshops, attended by industry professionals including electrical engineers, authorising engineers, health, safety and environment (HSE) professionals, and training providers, focused on refining and standardising the WTSRs. The aim was to ensure a consistent and robust approach to safety that could be adopted globally across the wind industry.

At the UK workshop, held on April 4, 2024, in Glasgow, attendees validated data produced from an industry wide survey and selected the following three top improvement opportunities:

1. audit and compliance;
2. variation between document and rule sets, and
3. training and competence.

The workshop highlighted the need for better guidance in adopting the WTSRs, consistent auditing practices with independent auditors, and a baseline competency standard for industry personnel.

In North America, the workshop on April 18, 2024, in New Bedford, MA, focused on defining a 'gold standard' electrical safety programme (ESP) and comparing current practices to this idea. Key recommendations included:

1. setting industry-wide training and competence standards;
2. establishing a comprehensive audit program;
3. implementing a central registry of authorisations and competencies, and
4. defining a standardised permit to work system.

The European workshop, held on May 2, 2024, in London, followed a similar format to the workshop held in New Bedford, where groups discussed and identified necessary actions to improve safety standards.

The workshops across the three different regions consistently emphasised the importance of harmonising safety protocols and ensuring consistent application of safety rules globally.

The report concluded with six key recommendations for further industry consideration regarding feasibility:

1. review existing rule sets to harmonise global renewable electrical safety standard;
2. consider common competency matrix;
3. consider common authorisation standard;
4. consider centralised authorisation process;
5. consider centralised authorisation and training database, and
6. consider standardising work documentation.

Given the immediate need to rapidly expand the skilled workforce in the global electricity supply industry, these recommendations aim to create a safer, more efficient, and standardised approach to aid that goal in the wind industry, while supporting industry growth and mitigating risks.

DEFINITIONS AND ABBREVIATIONS

Table 1: Definitions

Term	Definition
Electrical safety programme	A comprehensive set of procedures and practices designed to protect workers from electrical hazards. This terminology is often used in the USA. For the purposes of this report, the term electrical safety programme (ESP) is taken to include the control of other forms of hazardous energy, i.e. Control of Hazardous Energy (CoHE).
Safe System of Work	A formal procedure or method designed to ensure that tasks are carried out safely and risks to health and safety are minimised.
Safety Rules	A comprehensive set of procedures and practices designed to protect workers from electrical and mechanical hazards. This terminology is often used in the UK. In the USA the term ESP or CoHE program is used where mechanical hazards exist alongside electrical hazards.

Table 2: Abbreviations

Abbreviation	Definition
AE	Authorising Engineer
APAC	Asia-Pacific
AO	Authorisation Officer
AT	Authorised Technician
AWP	Approved Written Procedure
CCSG	Client Contractor National Safety Group
CoHE	Control of Hazardous Energy
CT	competent technician
EI	Energy Institute
E&M	electrical and mechanical
EMSR	Electrical and Mechanical Safety Rules
EN	European Norm
ESP	Electrical Safety Programme (not to be confused with electrical services platform)
GWEC	Global Wind Energy Council
GWO	Global Wind Organisation
HSE	health, safety & environment
HV	high voltage
H&S	health and safety

Table 2: Abbreviations (continued)

ISO	International Organisation for Standardisation
ISP	Independent Service Provider
LOTO	lock out, tag out
LV	low voltage
OEM	original equipment manufacturer
OSRG	Operational Safety Review Group
PPE	personal protective equipment
SC	Steering Committee
SLA	Service Level Agreement
SME	Subject Matter Expert
SP	support procedure
SSoW	Safe System of Work
TAC	Technical Advisory Committee
UK	United Kingdom
USA	United States of America
WTG	wind turbine generator
WTSR	Wind Turbine Safety Rules
WTSSR	Wind Turbine System Safety Rules

1 INTRODUCTION

Onshore and offshore wind farms have proliferated across the globe, contributing significantly to the global energy mix. The EI 2024 Statistical Review of World Energy report states that 'wind achieved a record year for new build with over 115 GW coming online. This equals a global growth rate of 12,9 % per annum for offshore and onshore installed wind turbine capacity. It remarked that most of the increase was in wind generation, driven by higher wind speeds and new onshore and offshore capacity.' Furthermore, the Global Wind Energy Council (GWEC) predicted that there will be around 380 GW of renewable energy generation capacity in the next decade.

Whilst the growth of the industry is remarkable to witness, it continues to offer challenges from a H&S perspective as the industry needs to maintain pace with its development and the introduction of new technologies. Growth must be coupled with robust HSE practices to ensure the wellbeing of employees – the safety of personnel is, and should remain, of paramount concern.

Wind generation sites comprise numerous different interconnected electrical networks and systems. Each of these will be governed by different rules, protections and/or controls which have clearly defined system boundaries. It is a legislative requirement that everyone required to work on, or adjacent to, electrical systems must have sufficient technical knowledge, training, and experience (or be under suitable supervision) to prevent danger. Therefore, it is the responsibility of all employers, owners, and operators to ensure sufficient SSoWs are in place to accomplish this.

Electrical safety is paramount in ensuring the well-being of individuals and protecting assets. A standardised global framework for electrical safety should serve as a comprehensive roadmap for implementing and maintaining safe electrical systems. By establishing clear standards, implementing rigorous procedures, and fostering a culture of safety awareness, organisations can mitigate electrical hazards and create a safer working environment for all. The adoption and enforcement of a global standardised framework for electrical safety is essential towards building a resilient and safe future.

It needs to be noted that terms like 'Electrical Safety Programme' and 'Safe System of Work' are used inconsistently in this report due to different terminology being used in different geographical regions. For this report, terminology as defined in Table 1 is used. Safety Rules/ESPs reside within a broader SSoW. An organisation's SSoW is deployed to control all hazards. Safety Rules/ESPs are focused on the electrical (and mechanical) aspects of this and not on other aspects of hazard control so are therefore not a SSoW per se. It should be noted for clarity that Safety Rules, CoHE and ESPs may often be referred to by some as a SSoW. In the context of this document and the scope of the workshops, the four phrases seem interchangeable so the reader should not be concerned about seeking out the distinctions between them.

1.1 SCOPE

In 2020, the WTSR Steering Committee (SC) was installed with the objective to provide governance and leadership in developing a common understanding of good practice to manage the electrical and mechanical safety risks arising from planned and installed onshore and offshore wind installations and to support and enable the work undertaken by the Operational Safety Rules Group (OSRG). The primary focus of the WTSR SC is based on three essential pillars which include:

1. high level principles and an overhaul of the existing WTSR in the UK;
2. implementation of the rules internationally, and
3. application of the WTSR.

To address the above pillars, a survey was developed to explore how the WTSR are used and how they are perceived, especially in their application within and outside of the UK. The survey was split into two sections: application of the rules, and challenges of using the WTSR. It aimed to gather experiences and challenges organisations might be facing.

The survey was circulated to SafetyOn and G+ members, and members were asked to further distribute the survey to their colleagues who are operating in different regions. The survey can be found in ANNEX A – WIND TURBINE SAFETY RULES SURVEY.

The deployment of the WTSR within the UK is well established. While the same type of rule set has also been implemented outside of the UK, including mainland Europe, the US and Asia-Pacific (APAC), it is still less adopted in these regions. Therefore, given that the workshops were based around the WTSR, a strategy was formed whereby the UK workshop would be based around the information provided in the WTSR Application Survey, but the North American workshop and the European workshop would be based on a more general approach to establishing what a gold-standard SSoW looks like.

Based on the findings from the survey, it was agreed to hold three workshops as follows:

1. UK workshop;
2. European workshop, and
3. North American Workshop.

The North American workshop was facilitated via the G+ Americas Focal Group within their dedicated workstream on ‘International framework for electrical safety’ and therefore focused on offshore wind only. Another G+ workshop is planned to be held in APAC.

1.2 PRESENTATION

This report is split into three sections:

– Section 1 outlines proceedings of the workshop focused on addressing the challenges of the implementation and application of the WTSR within the UK.

– Section 2 of this report outlines the proceedings from North American workshop – to identify what a gold-standard SSoW looks like.

– Section 3 outlines proceedings of the European workshop which was convened with the same agenda as the North American workshop – to identify what a gold-standard SSoW looks like.

In each section the workshop methodology, findings and recommendations for industry are presented. There is information giving detail on each of the workshops that took place. There follows the output generated by the participants. This has been kept, as much as possible, in the same format that it was presented back to in the plenary sessions. It is this information that has led to the conclusions. The recommendations presented in this report are as a direct result of this information and the discussions that followed.

2 UK WORKSHOP – WTSR FOCUS

2.1 METHOD, AGENDA, ATTENDANCE

A one-day workshop was held on 4 April 2024 at the Pentagon Centre in Glasgow, which was attended by over 40 industry professionals from the onshore and offshore wind industry, including electrical engineers, authorising engineers, HSE professionals and training providers.

The data collated from the survey was presented to attendees. Before any workshop activity commenced, delegates were asked to:

1. validate the survey information;
2. augment the information with any further issues not discovered in the survey, and
3. select the top three 'priority' improvement opportunities based upon the information gathered.

In no particular order, the three priorities were identified as:

– audit and compliance;
– variation between document and rule sets, and
– training and competence.

The delegates were then split into three working groups. Each group would address each of the three priorities to discuss on a rolling basis over three separate group sessions. The design of this approach was to obtain some validation of outputs from varying sources.

Output data from the UK workshop is detailed in 4.2 of this document.

The agenda for this workshop can be found in Annex B.

A list of delegates who attended this workshop is available in Annex C.

2.2 KEY THEMES AND RECOMMENDED INDUSTRY ACTIONS

– Guidance in adopting the rules

The WTSR should provide sufficient information to establish a robust system, however, there is often an argument put forward that the rules are too specific and don't allow for flexibility and a counter argument to say that it's not specific enough. Better guidance in adopting the rules would be beneficial to address these issues.

– Auditing

During the workshop it was noted that there is no consistent approach or documents/ templates available for auditing. It was suggested that, even if the correct audits were happening, they would be subjective and divergent potentially leading to low value outputs and missed opportunities to make overall improvements to the WTSR.

The importance of auditing is well recognised as part of maintaining a SSoW. There are external courses provided through which candidates can achieve a recognised auditing qualification, however guidance on how auditing is done may prove beneficial to the industry.

It was also raised as a concern that there is no independence of auditing – some auditing, currently, is carried out in-house or even as self-audit. Auditors are frequently deployed from other functions due to lack of expertise in the electrical field. It is felt that there could well be an insufficient level of expertise carrying out many audits in the area. There is, therefore, questionable value in the current information that audits produce.

– Competency

Another fundamental omission from the currently available safety rules is the inability to know the baseline competence of any individual. This was identified as an obvious safety issue but also as a source of commercial pressure as every operative, to some extent, starts their authorisation process from scratch.

It was debated if the current deployment of WTSR was inconsistent across the industry. It was widely accepted, at least, that they are too much open to interpretation without a central 'go-to' authority for advice or even arbitration.

3 NORTH AMERICA WORKSHOP

3.1 METHOD, AGENDA, ATTENDANCE

A one-day workshop was held on 18 April 2024 in New Bedford MA, which was attended by 18 industry professionals from the offshore wind industry, including electrical engineers, authorising engineers, HSE professionals and training providers. The agenda for this workshop is available in Annex D. A list of delegates is available in Annex E.

The North American workshop was based on a more general approach to ESPs. The approach was to obtain consensus on what a gold-standard electrical SSoW would look like. The information on the gold-standard would then be compared to what practices and systems were currently in deployment across the delegates' organisations.

There were two group sessions planned for these workshops as follows:

1. What does a 'gold-standard' Electrical SSoW look like?
2. How do the currently deployed Electrical SSoWs compare to the gold standard?

The North American group was smaller in size, so it was decided that day to keep the group together to address both questions.

The workshop addressed the issue of a gold-standard ESP. Rather than immediately specifying the components of a gold-standard safety programme, delegates entered constructive discussion about their experiences within their own companies.

With natural evolution of the conversation, the group moved on to specifying the components of their gold standard ESP.

3.2 KEY THEMES AND RECOMMENDATIONS FOR A GLOBAL ELECTRICAL SAFETY PROGRAMME

Summary of desired actions

Having had earlier discussions regarding practices within member companies, the group used the second session time to discuss what the main deliverables should be and what roadblocks could be experienced.

A summary of the core desired deliverables is based upon the prior implementation of a universally adopted ESP follows:

- Set a standard for training and assessing workers – competency matrix.
- Set a standard for nominating the individuals carrying out the assessments.
- Define 'levels' of work, i.e. non-electrical/routine electrical/troubleshooting/ commissioning.
- Set the audit program.
- Central registry of authorisations across industry.
- Competence matrix needed across all organisations.
- Defined Permit to Work System.

It was also identified at this workshop that there is a terminology gap between the WTSR and what the North American market requires. This is particularly pertinent on the topic of role names. The variance from region to region for broadly similar functionality could be bridged but it was considered to be more than a simple bridging exercise for some of the functions operating in the wider electrical safety field.

4 EUROPEAN WORKSHOP

4.1 METHOD, AGENDA, ATTENDANCE

A one-day workshop was held on 2 May 2024 at the EI office in London, UK, which was attended by over 30 industry professionals from the onshore and offshore wind industry.

The agenda for the workshop is given in Annex B and a list of delegates who attended the workshop in Annex C. Like the North America workshop, the Europe workshop was based on a more general approach to an electrical SSoW.

For this workshop, delegates were split into three working groups. Each group would break out and address the first question and gather to briefly discuss their outputs. They would then reconvene their working groups and address point two based on the information gathered in the first group session.

4.2 KEY THEMES AND RECOMMENDATIONS FOR A GLOBAL ELECTRICAL SAFE SYSTEM OF WORK

Summary of desired actions

The group members of this workshop brought considerable experience in management and revision of electrical SSoWs, including the WTSR and their global application.

In the second session the group built upon the identification of its preferred components of an electrical SSoW to discuss what the main deliverables should be and what roadblocks could be experienced.

A summary of the required deliverables is based upon the prior implementation of a universally adopted electrical SSoW bore significant resemblance to that outlined by previous workshops and follows:

- Standardise roles and responsibilities.
- Standardise training and assessing using a universally agreed competency matrix.
- Develop a standard for authorising all individuals carrying out the assessments.
- Develop a standard for implementing the authorisation of individuals that will be set to work.
- Develop a full audit program strategy for organisations deploying the safe system of work.
- Develop a centrally held and maintained database of authorisations across industry.
- Standardise Approved Written Procedure (AWP) and safety document templates across the industry.

It was also identified at this workshop, as at the North American workshop, that there is a terminology gap between the WTSR and what is required in other legislative jurisdictions. Again, this is particularly pertinent on the topic of role names and responsibilities those roles carry. The group recognised that a simple mapping of role names would not be the solution to this issue and that further work would be required to ensure that responsibilities held by organisations and individuals would be adequately allocated.

5 CONCLUSIONS AND RECOMMENDATIONS

There is a strong desire across interested parties to implement a common approach to electrical and mechanical safety in the renewables sector. This is the minimum that is required to enable the desired and necessary improvements.

There remains a genuine need to deliver meaningful solutions for the industry to meet its expansion needs – failure will seriously inhibit the required growth in the control of electrical and mechanical work. There is an indisputable cascade effect to commercial risk. The workshops agreed that some organisations may currently be unaware of the criticality and magnitude of this competence bottleneck.

It is widely agreed that the WTSR are well developed and deployed in the UK. The rules have also been deployed to a lesser extent beyond the UK and at a pace that is slower than some expected. It is vital to engage with the non-UK users and gain their input into a globally usable system.

The six recommendations for further consideration by industry regarding feasibility are as follows:

5.1 REVIEW EXISTING RULE SETS TO HARMONISE GLOBAL RENEWABLE ELECTRICAL SAFETY STANDARD

In the renewables sector, there are currently two widely used approaches to electrical and mechanical safety, with an additional third approach in development.

The WTSR are widely used but are limited to controlling the low voltage (LV) and mechanical hazards within the WTG. Currently, the mechanical hazard outside WTG and any high voltage (HV) hazards (inside and outside the wind turbine), are controlled by so-called HV rules or Electrical & Mechanical Safety Rules (EMSR).

The forthcoming, but as yet untested, Wind Turbine System Safety Rules (WTSSR) introduces a third set of safety rules and will, in addition to the functionality of the WTSR, also enable control of some of the HV hazards. Again, this is limited to within the WTG with the expectation that the switchgear associated with array cable feeders would remain under the control of the HV rules. As such, it is anticipated that a boundary exists in the WTG between rule sets.

To write an entirely new rule set would be inefficient as the three approaches discussed above contain all of the necessary controls to maintain the highest standard of electrical and mechanical safety.

This recommendation is, therefore, to use the philosophies of the existing rule sets and to ensure the practicalities of the WTSR and WTSSR are adequately amalgamated.

It should be highlighted that the intention from the outset should be to configure the rules to be flexible and selectable to preserve the current functionality of WTSR, WTSSR and HV rules. It should also include all the requirements of those regions that have a different approach to the control of the electrical and mechanical hazards and the associated governance.

For the removal of doubt, implementation of the amalgamated rule set should not result in anything beyond minor rework of any organisation's current documentation.

The review of the existing rule sets should consider elements such as:

- Having functionality to control the mechanical and electrical hazards associated with a WTG.
- Covering all voltage levels.
- Having common communication protocols across boundaries.
- Retaining the existing capability to deploy both pre-approved switching, lock out, tag out (LOTO) and AWPs. Additionally, maintaining the established approach commonly used within HV Rules for switching schedules and safety documents.
- Defining roles and responsibilities across the rule set and enabling capability for an individual to obtain authorisation to work on some or all components of the installations or all. Design this in such a way that it can be harmonised across all organisations, from the largest to the smallest operating in the industry.
- Developing robust guidance on the implementation of the newly amalgamated rule set with the aim of enabling a more consistent approach across organisational and geographical boundaries.

5.2 PRODUCE A GLOBAL COMPETENCY MATRIX

Produce a global competency matrix outlining the recommended training and competency requirements across the different roles under Safety Rules. that can be deployed across the industry. This is required to be sensitive to legislative requirements and also local custom and practice in any jurisdiction of deployment. The matrix should be aligned with country specifics where differences exist.

The matrix should:

- Account for all levels or operatives within the industry including but not necessarily limited to:
  - Basic electrical and mechanical (E&M) worker working under instruction and supervision.
  - Supervisor of E&M work.
  - E&M Operator, responsible for operation of equipment and applying LOTO.
  - Senior E&M Responsible Person, charged with determining what precautions are required to be implemented by themselves or the Operator before any person can be set to work.
  - Central Control, responsible for keeping a systemwide overview and agreeing to the release of equipment for work and for communicating and coordinating between remote locations and Operators.
- Be of a sufficiently high standard to satisfy the requirements of all of the industry participants.
- Be sufficiently controlled such that training organisation can produce high quality training but also robust enough to be audited against.

5.3 COMMON AUTHORISATION STANDARD

Produce a common authorisation standard for each of the above roles to implement industry wide. Again, this is required to take account of legislative requirements in all countries of deployment. It is required to be adaptable such that it can take account of country specific requirements.

The common training standard should:

– Act as a framework for each role and have sufficient depth that all interested parties have the necessary assurance of competence.
– Published and verifiable business to business with no room for ambiguity.
– Enable early deployment of new employees and contractors with high levels of confidence in their competence. Minimise requirements for business-by-business authorisation panels and interviews.

5.4 CENTRALISED AUTHORISATION PROCESS

Implement a framework such that a centralised authorisation process could be offered to organisations large and small.

The centralised authorisation process should:

– Provide an independent authorisation option that keeps competence measurement to an impeccably high standard.
– Optional as to whether organisations rely on their internal assessment capability or rely, in part or in whole, on an external assessing body.
– Include framework for appointing auditors to maximise improvement opportunities. Potential to deploy independent auditors to gain consistency.
– Use as a tool to measure outcomes from training providers to drive up learning and training performance and quality.
– Use as a tool to generate improvements in the common training standard mentioned above.

5.5 CENTRALISED AUTHORISATION AND TRAINING DATABASE

Explore the feasibility of a database that can be used, in a controlled way, by organisations to verify competence of current and prospective employees. Use to track associated training of individuals and deploy as an audit track tool to enable high confidence in the stated competence if an individual.

– Implement a centralised repository for information relating to competence of authorised workers.
– Centralise and retain vital information about authorisations, training and audit results.
– Maintain data protection compliance in all areas of deployment.
– Avoid the ability to use as a ‘blacklist’ or recruitment tool.

5.6 STANDARDISED WORK DOCUMENTATION

Convene a cross-business group to examine the feasibility of creating a central repository work documents currently known as AWP.

– Standardised AWP.
– Examine liability issues.

ANNEX A
WIND TURBINE SAFETY RULES SURVEY

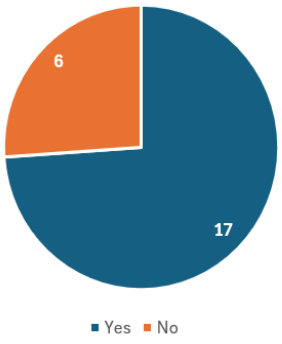
Survey was circulated to the following groups:

- WTSR SC;
- OSRG;
- SafetyOn Technical Advisory Committee (TAC);
- G+ APAC, USA & Europe Focal Group;
- G+ Electrical Safety Working Group, and
- anyone else who could provide valuable feedback

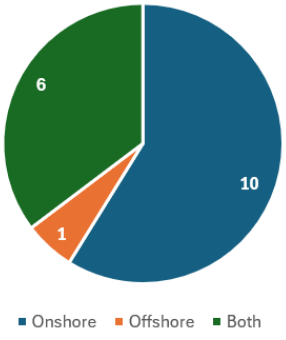
39 responses received and rationalised to account for multiple responses from any organisation.

Banks Renewables	**Renantis**
COP	**RES**
EDF renewables	**Scottish Power Renewables**
EDF renewables UK & Ireland	**Shell**
Enercon	**Siemens Gamesa**
Eneco	**SSE**
Equinor	**Statkraft**
Full Circle Wind Services	**Vattenfall**
Iberdrola	**Ventient**
Ocean Winds	**Vestas**
Orsted	**Vena Energy**
RWE Offshore & Onshore	

Is your company using the WTSR as your 'SSoW' for Electrical Safety?



Where does your company apply the WTSR?



Why did your company choose the WTSR as a SSoW of Electrical Safety?

- UK and Ireland industry standard – widely used
- Standardisation of a SSoW- widely used across OEMs
- Lead in compliance with industry good practice
- Provides a good minimum safety level due to combination of procedural processes and strong competence management

What are the benefits of using the WTSR as a SSoW?

- Enhanced safety: enhance safety for people and plant.
- Regulatory compliance: avoid legal and regulatory challenges.
- Operational efficiency: reduces downtime, enhances productivity.
- Standardisation and consistency, provides a consistent and standardised approach to safety across all wind assets.
- Industry recognition and acceptance: recognised as best practice in the industry, accepted by multiple stakeholders, including owners, OEMs, and UK Health & Safety Executive.

What companies said they used for Electrical Safety in lieu of WTSR?

- Companies' internal set of rules
- LOTO
- Procedures to meet requirements from EN50110
- Procedures to meet requirements from NEN 3140 and NEN 3840
- ESPs
- Company-specific energy isolation procedures

Details for why the WTSR are not used?

- Alignment with Internal HV/LV safety rules.
- Familiarity with EN50110 and LOTO.
- WTSR are fully embedded only in the UK as the primary SSoW.
- Review and implementation: companies need to review and assess WTSR's applicability before implementing them.
- Lack of knowledge/awareness of WTSR.

ANNEX B
WORKSHOP AGENDAS

B.1 UK WORKSHOP AGENDA

Wind Turbine Safety Rules Workshop

Date: 4 April 2024

Venue: Glasgow Training Rooms, The Pentagon Centre, 36 Washington St, Glasgow, Scotland, G3 8AZ

Time	Item	Description
09:30	*Arrival*	*Coffee and registration*
09:45	**Welcome**	**Opening remarks, setting the scene**
09:50	**Presentation**	**Validation of survey/challenges**
10:05	**Workshop Exercises**	**Introduction and outline format of the day**
The following 3 Group Sessions will operate on a rotation		
10:15	**Group Session 1**	Group A -> Priority 1 and 6 Group B -> Priority 2 and 5 Group C -> Priority 3 and 4
11:15	**Group Session 2**	Group A -> Priority 2 and 5 Group B -> Priority 3 and 4 Group C -> Priority 1 and 6
12.15	*Lunch*	
13:00	**Group Session 3**	Group A -> Priority 3 and 4 Group B -> Priority 1 and 6 Group C -> Priority 2 and 5
14:00	*Comfort break*	
14.15	**Plenary Feedback**	**Discussion of total group sessions output**
14:45	**Closing remarks**	
15.00	**Workshop close**	

B.2 US WORKSHOP AGENDA

North America Electrical Safe System of Work Workshop

Date: 18 April 2024

Venue: The Vineyard Room, Waypoint Event Centre, 185 MacArthur Drive, New Bedford MA 02740

Time	Item	Description
08:30	*Arrival*	*Coffee and registration*
09:00	**Welcome**	**Opening remarks, setting the scene**
09:10	**Introduction**	**Workshop, outline format of the day**
09:30	**Group Session 1**	**What does a 'gold standard' Safe System of Work look like?**
11.00	*Break*	
11:15	**Group Session 2**	**How do the currently deployed Safe Systems of Work compare to the gold standard?**
12:45	*Lunch break*	
13.30	**Plenary Feedback**	**What are the next steps?** **Status quo or move toward a common Safe System of work approach?**
14.15	**Closing remarks**	**Recap of actions/next steps**
14.30	**Workshop close**	

B.3 EUROPEAN WORKSHOP AGENDA

Europe Electrical Safe System of Work Workshop

Date: 18 April 2024

Venue: The Energy Institute, 61 New Cavendish Place, London, W1G 7AR

Time	Item	Description
09:30	*Arrival*	*Coffee and registration*
09:45	**Welcome**	**Opening remarks, setting the scene**
10:00	**Introduction**	**Workshop, outline format of the day**
10:30	**Group Session 1**	**What does a 'gold standard' Safe System of Work look like?**
12.30	*Lunch*	
13:15	**Group Session 2**	**How do the currently deployed Safe Systems of Work compare to the gold standard?**
15:15	*Comfort break*	
14.30	**Plenary Feedback**	**What are the next steps?** **Status quo or move toward a common safe system of work approach?**
15.15	**Closing remarks**	**Recap of actions/next steps**
15.30	**Workshop close**	

ANNEX C
WORKSHOP ATTENDEES

C.1 UK WORKSHOP ATTENDEE LIST

Representatives of the following companies attended:

BayWa re
Deutsche Windtechnik
EDF
ENERCON
Equans
ESB
Fairwind
Gael Energy
GE
Geo Structural
Global Wind Projects
Greencoat
Greensolver
Nadara
Natural Power
Nordex
Realise Energy
Redrock Power
Renewable Safety
RES
RWE
Skanwear
SPR
SSE
Vattenfall
Vestas
Wood

C.2 US WORKSHOP ATTENDEE LIST

Representatives of the following companies attended:

Avangrid
bp
Equinor
Ocean Winds
Ørsted Americas
RWE Offshore US
Shell Energy
Siemens Gamesa Renewable Energy
Vineyard Wind

C.3 EUROPEAN WORKSHOP ATTENDEE LIST

Representatives of the following companies attended:

Corio Generation
Cubcio Invest
Deutsche Windtechnik
EDF
Equnior
ESB
Fairwind
Manxutilities
Orsted
RWE
SGRE
Skanwear
SSE
Statkraft
Total Energies
Vattenfall
Vestas

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