



Submitted by	No	Document	Section number	Type of comments	Comments	Proposed change	Observations of EirGrid / ESBN	Response Category
IWEA	1.	ODS-GFS-00-001-R1 & OCDS-GFS-00-001	-	GE	Given the relatively high level nature of these documents and the lack of information about the EirGrid position on wider connection offer policy and methodology for offshore (i.e. contestable/non-contestable, project interfaces, grid connection operation, etc., it would be beneficial to review these specifications regularly, or at the very least once again when the above is known.	No change is foreseen in updated specification	Offshore Functional Specifications will be reviewed on a regular basis and following any potential future changes to offshore development models. Functional Specifications will typically not outline ownership boundaries. EG view is that this will form part of a project specific document.	Accepted
IWEA	2.	ODS-GFS-00-001-R1 & OCDS-GFS-00-001	-	GE	Several requirements throughout are undefined/unquantifiable and therefore difficult at this stage to provide any detailed or specific comment on, (e.g. "operational support", "training", etc.), other than to note the difficulty in understanding the scope and nature of what is required, how it can be provided for in the contract structure of any project, and how much it may cost. Again in the absence of connection offer policy this is all the more unclear.	A text change has been added to clarify the specification to provide clarity.	Training and operational support requirements were referred to in OCDS-GFS-00-001 in section 5.3.1 specifically for DTS system. As this system is critical to analyse the condition of the cable EirGrid/ESBN will require engagement and an awareness of this system to ensure compatibility. As the offshore model develops the requirements may develop further.	Accepted
IWEA	3.	ODS-GFS-00-001-R1	-	GE	Can some outline context to this document be stated in terms of whether it relates only to the EirGrid areas of the substation, all HV areas, or it is intended to relate to the entirety of the Offshore Substation Platform (OSP)?	Spec ODS-GFS-00-001-R1 states "The following functional specification outlines the general requirements for a High Voltage AC Offshore Substation". To clarify further, the components on the OSP relating to the HV AC Offshore Substation is applicable. (Customer Power Transformer and Medium Voltage switchboard not included.)	Spec ODS-GFS-00-001-R1 states "The following functional specification outlines the general requirements for a High Voltage AC Offshore Substation". To clarify further, the components on the OSP relating to the HV AC Offshore Substation is applicable. (Customer Power Transformer and Medium Voltage switchboard not included.) The OSP shall be a shared structure and any minimum requirement relating to the platform shall be met."	Clarified
IWEA	4.	ODS-GFS-00-001-R1	-	0	How is the design review procedure to operate? Are EirGrid intending to review designs in a similar fashion to 11kv/220kv onshore? Is the capability/expertise there? If the interface point is the onshore transmission system point of connection and the infrastructure is not adopted what does the design review procedure look like?	No change is foreseen in updated specification	A design review procedure will occur for Offshore projects and EirGrid do not forecast any issues with expertise for this process. As the infrastructure may in the future form part of the transmission system, an EirGrid PM and Client engineer will be appointed by the TSO to ensure requirements are met. Further details on the role of the EirGrid CE is outlined in EG Safe By Design XDS-SDM-00-001	Clarified
IWEA	5.	ODS-GFS-00-001-R1 & OCDS-GFS-00-001	-	GE	The functional specifications should preferably not dictate the contractual scope split (nor insist on certain interfaces) but instead set out the design/engineering requirements. For example, "design of J-tubes is the responsibility of the substation contractor". It is requested this principle is taken into account and the wording of the document throughout is revised accordingly.	The following text change was added to the specification to provide clarity: "For the purpose of this specification the term Customer shall refer to any party (Independent Power Producers, Transmission Asset Owner, or other developers) responsible for the design and build of assets for connection to the Irish transmission system."	Comment noted and accepted.	Accepted
IWEA	6.	ODS-GFS-00-001-R1 & OCDS-GFS-00-001	-	GE	The functional specifications dictate certain requirements for equipment e.g. example power transformers to be housed indoors, when in an international context there are fully adequate designs where this is housed outdoors (and designed for accordingly). Can it be clarified that this is acceptable if adequately designed and approved? Is there a particular reason for this approach?	The following text change is made: "The customer shall design and install the substation using Gas Insulated Switchgear (GIS) technology housed indoors in line with EirGrid Functional Specifications for 110/220/400kV Gas Insulated Switchgear (GIS) XDS-GFS-25-001."	Equipment to be housed indoors refers to HV GIS switchgear. Note, EirGrid will specify the Power Transformer requirements.	Clarified
IWEA	7.	ODS-GFS-00-001-R1	-	GE	The functional specification sets out the design process but should set out only the engineering requirements with the developer responsible for achieving the functional specification (not a set design process). This limits flexibility and in the context of lacking information in terms of connection offer methodology it is difficult to understand the impact of this in the specifications at this time.	The functional specification has been updated to set out the engineering requirements. Reference to the design process is minimal.	Noted and accepted.	Accepted
IWEA	8.	ODS-GFS-00-001-R1 & OCDS-GFS-00-001	-	GE	There are several instances of "cause" and "effect" which are not functional requirements. Can the wording be reviewed to either be specific on the required functional system, or the end function that is required?	Specification has been revised to be functional in nature in so far as possible. Without specific examples, it is difficult to be sure that these instances are captured.	Noted.	Accepted
IWEA	9.	OCDS-GFS-00-001	-	GE	Are spares required for the full duration of the assets?	No change is foreseen in updated specification.	See extract from OCDS: "The spare cable provided shall be placed on a suitable galvanised steel drum, basket or tumbler which shall be lagged or covered with suitable material to provide physical protection for the cables during shipment, storage, handling and in the case of cable spares, the required design life."	Clarified



Submitted by	No	Document	Section number	Type of comments	Comments	Proposed change	Observations of EirGrid / ESBN	Response Category
IWEA	10.	ODS-GFS-00-001-R1 & OCDS-GFS-00-001	6	GE	Site specific logistics planning (i.e. weather conditions, asset requirements, replacement plans, etc.) is a key part of the design of an OSP and the OSP cannot be designed in isolation of this.	A text change has been added to the specification to provide clarity. *A site specific logistics plan shall be compiled including, as a minimum, consideration of: weather conditions, asset requirements, replacement plans, maintenance requirements etc. The offshore platform design shall be undertaken with reference to this plan.*	Noted and accepted.	Accepted
IWEA	11.	ODS-GFS-00-001	9.7	GE	The functional specification should not dictate or state directly the matters typically determined by other authorities (e.g. CIL and IAA determine appropriate navigational aids, etc.).	No change is foreseen in updated specification	EirGrid has no intention of dictating matters not under our remit. The purpose of the specification is to be functional in nature for the delivery of a safe, secure and successful design. If there are operational risks imposed from other relevant authorities it is good practice that TSO spec point to other authorities to ensure the design phase is cognisant of these requirements / specifications.	Declined
IWEA	12.	OCDS-GFS-00-001	7.2.2	GE	A design life of 40 years is specified – this deviates substantially from other comparable projects across Europe which generally have an operational design life of 25 years and/or with topside design life of 29 years to take into account the period of installation before the windfarm is operational and the period before de-commissioning). To what is this design life intended to apply? EirGrid equipment/rooms? All equipment and the entire platform and everything on it? The cost of this requirement alone will increase the LCOE of onshore wind in the Irish system.	No change is foreseen in updated specification	Comment noted and can be considered at a later date. EirGrid has seen no indications that this infrastructure cannot meet the requirements set out, 40 years lifetime will likely remain as a requirement.	Declined
IWEA	13.	OCDS-GFS-00-001	7.2.13	TE	Two system studies are specified. Who is responsible for all other relevant studies e.g. requirements for compensation or harmonic filtering, tap changer requirements, insulation co-ordination etc.?	Clause was modified as follows: *Treatment of the MV neutral shall remain the responsibility of the Customer. All other system studies required for the design of the substation shall also be undertaken by the customer. Any other system studies as required by the Grid Code and Connection Agreement shall also be carried out.*	Process shall be followed in line with onshore wind farm projects.	Clarified
IWEA	14.	ODS-GFS-00-001	8 & 9	TE	There is no requirement for condition monitoring and SCADA connection for major equipment. What is required? In international experience this is key in safe reliable and cost effective management and maintenance.	Clause modified as follows: *All data from assets on the platform shall be collected via RTUs on the offshore platform to a SCADA system situated at the onshore substation. The SCADA system shall include at a minimum: *Duplicated master-slave server *Archiving *Workstation *Facilities for remote interrogation *Facilities to interface with NCC and DCC as required.*	Noted and accepted.	Accepted
IWEA	15.	OCDS-GFS-00-001-R1	3	TE	Is it not the case than DNV-RP-J303 has been superseded by DNVGL-RP-0360?	Updated in revised specifications	Comment noted and accepted.	Accepted
IWEA	16.	OCDS-GFS-00-001-R1	4.8.1	TE	Design of J Tubes would usually specify minimum amount of bends as reasonably practicable and minimum of 3m clearance to sea floor.	No change is foreseen in updated specification	The purpose of the specification is to be functional in nature and guide the designer towards the items that require consideration as part of the delivery of a successful design. Whilst the general criteria outlined are reasonable for a design today, installation techniques and practices change according to technology and experience. Hence specific parameters are not specified here.	Declined
IWEA	17.	OCDS-GFS-00-001-R1	4.8.1	TE	Duct/tube diameters would usually specify a minimum diameter of 2.5 times the cable diameter (i.e. in order to reduce friction).	No change is foreseen in updated specification	The purpose of the specification is to be functional in nature and guide the designer towards the items that require consideration as part of the delivery of a successful design. Whilst the general criteria outlined are reasonable for a design today, installation techniques and practices change according to technology and experience. Hence specific parameters are generally not specified here.	Declined
IWEA	18.	OCDS-GFS-00-001-R1	12.1	GE	Cable route design should take account of UXO's and boulders (if no UXO/Boulder clearance campaign planned).	Bullet point will be added: *Locations of UXOs and boulders"	Comment noted and accepted.	Accepted
IWEA	19.	OCDS-GFS-00-001-R1	4	TE	Material/Cable System Design – allowable compression would usually be included.	No change is foreseen in updated specification	See earlier comments regarding that this is a functional specification. Where specific risks or requirements are identified on a project by project basis, then specific details will be provided as part of that project.	Declined

A green box implies the comment was accepted and incorporated.
An orange box indicates a comment was clarified.
A red box implies a comment was reviewed and excluded from revised spec.



Submitted by	No	Document	Section number	Type of comments	Comments	Proposed change	Observations of EirGrid / ESBN	Response Category
IWEA	20.	OCDS-GFS-00-001-R1	4	TE	Required technical details for transportation and installation analysis would usually be included e.g. crush loads, etc. on the list seems very general.	No change is foreseen in updated specification	See earlier comments regarding that this is a functional specification. Where specific risks or requirements are identified on a project by project basis, then specific details will be provided as part of that project.	Declined
IWEA	21.	ODS-GFS-00-001-R1	N/A	TE	There are later revisions/standards of the marine related guidelines/practices stated within the document.	Text change has been added to the specification to reference updates guidelines.	Comment noted and standards updated.	Accepted
IWEA	22.	ODS-GFS-00-001-R1	7.2.3	TE	Requirements for GIS room should include additional space for cable termination as well as ongoing maintenance.	Clause updated to include: "Adequate space shall be provided in the GIS room for cable termination and ongoing maintenance."	Note and accepted. Sufficient space shall be provided for all Operational and Asset Management activities (Maintenance, Repair and Testing). The customer shall design and install the substation using indoor Gas Insulated Switchgear (GIS) technology in line EirGrid Functional Specification for 110/220/400kV Gas Insulated Switchgear (GIS) XDS-GFS-25-001. This covers O & M requirements.	Accepted
IWEA	23.	ODS-GFS-00-001-R1	7.2.7	GE	As per Point 7 & 8.	The functional specification has been updated to set out the engineering requirements and reference to the design process is minimal.	Noted.	Accepted
IWEA	24.	ODS-GFS-00-001-R1	9	TE	Are there environmental conditions for secondary equipment to be achieved by OSP M&E design? If so what are they? Or depending on the ownership/boundaries is this outwith EirGrid's concern/consideration?	Clause to be updated to include: "The environmental conditions shall be as specified in EN 60255-1"	Secondary equipment shall be housed indoor in protection environment.	Accepted
NKT	1.	OCDS-GFS-00-001	3	te	Cigré Electra No. 171 has been transferred to Cigré Technical Brochure No. 490, thus we would propose to delete the reference to an outdated document for any avoidance of doubt.	A text change has been added to the specification to provide clarity. Delete reference to Cigré Electra No. 171	Comment noted and accepted.	Accepted
NKT	2.	OCDS-GFS-00-001	3	te	Cigré Electra No. 189 has been transferred to Cigré Technical Brochure No. 623, thus we would propose to delete the reference to an outdated document for any avoidance of doubt.	A text change has been added to the specification to provide clarity. Delete reference to Cigré Electra No. 189	Comment noted and accepted.	Accepted
NKT	3.	OCDS-GFS-00-001	4.1.3	te	We believe you mean hygroscopic rather the hydrophobic.	Text shall be changed to "hygroscopic".	Comment noted and accepted.	Accepted
NKT	4.	OCDS-GFS-00-001	4.3	te	We believe a sampling period of <15 s is not feasible.	Text replaced by: "Dependent on system length, sampling period to be agreed with EirGrid on a project specific basis"	Noted.	Accepted
NKT	5.	OCDS-GFS-00-001	4.8.1, 4.8.2 and 4.8.3	te	We believe the clauses shall be part of the installation specification and not of the offshore cables.	No change is foreseen in updated specification.	These items relate to the installation. However, the items are included here for the purpose of ensuring that proper interface occurs between the supply and installation of the cables such that the construction and maintenance requirements are accounted for. There will be no installation specification and so these clauses will remain.	Declined
Innogy	1.	OCDS-GFS-00-001	4.1.3	te	Is it acceptable to have more than 24 fibres? It may be worth changing the wording to allow more fibres especially as the wind farm operator will likely require fibres for their systems.	Clause revised as follows: "Each three-core submarine cables shall contain <u>at least two (2)</u> fibre optic cables with <u>at least 24</u> optic fibres each. <u>The minimum number of fibres is dependent on the Customer and EirGrid communication and protection requirements and shall be agreed and communicated prior to design.</u> "	Noted.	Accepted
Innogy	2.	OCDS-GFS-00-001	4.2, point 4)	te	Is stainless steel armour deliberately prohibited for 3 core types? Some manufacturers use stainless steel armour to reduce losses due to induced currents.	Clause to be updated as follows: "Three core cable designs may be single or double wire armoured."	Noted	Accepted
Innogy	3.	OCDS-GFS-00-001	4.3, 5 th paragraph	te	In the past we have used a fibre in the main fibre communications bundle and not in the screen for DTS systems. Suggest discussion with cable manufactures to confirm cost increase of a screen located fibre	A text change will be added to the specification to provide clarity. "An additional fibre shall be provided in the cable (for example at the metallic screen layer of the power cable) to enable accurate conductor temperature measurements to be determined. <u>This fibre may be a part of the communications bundle.</u> "	Noted	Accepted
Innogy	4.	OCDS-GFS-00-001	4.3, 5 th paragraph	te	A single ended system would give the advantage that the panels could be installed onshore thus minimising the equipment installed offshore where access is difficult and maintenance is more expensive. For short cable lengths a single ended system could give adequate accuracy. I would suggest a single ended system, achieving the specified accuracy, may be more preferable based on lifetime costs.	Clause to be updated as follows: "DTS units will be employed in a loop or single ended configuration."	The preference is for a double-ended system, except where a single ended system is demonstrated to be adequate.	Accepted

A green box implies the comment was accepted and incorporated.

An orange box indicates a comment was clarified.

A red box implies a comment was reviewed and excluded from revised spec.



Submitted by	No	Document	Section number	Type of comments	Comments	Proposed change	Observations of EirGrid / ESN	Response Category
Innogy	5.	OCDS-GFS-00-001	4.3, 2 nd paragraph	ed	Is the requirement for section lengths of <10m consistent with a sampling/spatial resolution of <2m?	No change is foreseen in updated specification	Yes. 10m refers to the graphical interface, whereas 2m refers to the resolution of the DTS system.	Clarified
Innogy	6.	OCDS-GFS-00-001	4.6, 2 nd paragraph	ed	Typo "route cause"	A text change will be added to the specification to provide clarity. "root cause"	Noted	Accepted
Innogy	7.	OCDS-GFS-00-001	4.8.4	te	There may be instances where, for safety reasons associated with weather conditions the cable needs to be cut during a lay operation	Clause to be updated to include: "While it is understood that cutting the cable in emergency situations for safety reasons may be necessary, this does not imply a repair joint is acceptable. The need, manner and process of including such an unplanned joint shall be agreed with EirGrid. There may be occasions where replacement is preferred over repair."	The requirement is that unplanned joints will need to be agreed with EirGrid. This requirements is not meant to inhibit the safety of personnel or equipment. Where an unplanned joint is considered to be required, then the need, process and manner of its inclusion will be agreed with EirGrid. There may be occasions where replacement of the cable is preferred or that a single joint is included in preference to two.	Accepted
Innogy	8.	OCDS-GFS-00-001	5	te	It may be difficult to completely verify thermal ratings during commissioning due to the very long thermal time constants at HDD landfalls	Clause to updated to include the following: "Where long thermal time constants exist it is accepted that the system may not appreciate in temperature significantly but the cyclic response and anticipated temperature gain for that period should be estimated, analysed and confirmed as part of that process. If the thermal time constant is long and no appreciable temperature gain is anticipated then this should be demonstrated as part of the commissioning process."	Systems should be validated during commissioning as outlined in the specifications.	Accepted
Innogy	9.	OCDS-GFS-00-001	6	te	Consider whether Link Boxes are required offshore if the power cores have semiconducting sheaths, as is often the case. Or if a direct link to earth is sufficient.	No change is foreseen in updated specification	A Link Box is preferred. Propose to leave specification as is.	Declined
Innogy	10.	OCDS-GFS-00-001	8.2.1	te	Is there an Eirgrid standard that describes how these tests are to be conducted? For example magnitude and duration of supply voltage?	No change is foreseen in updated specification	There is no standard that covers the tests outlines in this specifications	Clarified
Innogy	11.	OCDS-GFS-00-001	8.5, 3 rd paragraph	te	Testing long lengths of 220kV export cables will be a significant logistical undertaking with several AC resonant test trucks being required. Are alternative tests acceptable?	Clause to be changed to add: "...unless agreed otherwise."	AC resonant tests are preferred. The contractor may propose other methods for consideration.	Accepted
Innogy	12.	OCDS-GFS-00-001	8.5.1.1	te	It would be useful to reference a standard so that the method of performing these tests is clearly defined.	No change is foreseen in updated specification	There is no standard that covers the tests outlines in this specifications	Clarified
Innogy	13.	OCDS-GFS-00-001	11, 5 th paragraph	ct	It would seem very unusual for the IPP to have to replace expired spare parts. Is the IPP responsible for these for the full 40 years	Section 12 on Spares has been updated with more clarity.	EirGrid recommends sufficient spares are considered and has provided requirements in line with onshore cable spare requirements.	Clarified
Innogy	14.	OCDS-GFS-00-001	12.2, 3 rd paragraph	te	Normally burial depth would be assessed by a Cable Burial Risk Assessment process. In some areas with rock and crossings 1m may not be achievable.	Clause to be updated as follows: "The submarine cable will be embedded in the sea bed to a minimum depth to be determined by a Burial Risk Assessment, and agreed with EirGrid. The Burial Risk Assessment is to be undertaken in accordance with CTC835. Greater burial depths may be required by EirGrid in areas where the risk of mechanical damage is greater such as in shipping lanes."	Noted	Accepted
Innogy	15.	OCDS-GFS-00-001	13, 1 st paragraph	te	Typo "The submission shall provide details of the all physical loadings..."	Noted, a text change added to the specification to provide clarity.	Noted	Accepted
Innogy	16.	OCDS-GFS-00-001	13, 2 nd paragraph	te	Usually offshore we would use stainless steel supports in open areas. It may be worth being open to the use of stainless steel of the appropriate grade?	Clause to be updated as follows: "Stainless steel is preferred. Where this is not offered, all steelwork shall be hot dip galvanised as per EirGrid specification XDS-GFS-18-00."	Noted	Accepted
Innogy	17.	OCDS-GFS-00-001						
Innogy	18.	ODS-GFS-00-001-R1	Glossary		Add the definitions of: LT	LV is the correct term. Glossary updated to include LV, specification to be updated to ensure LV is used consistently.		Accepted
Innogy	19.	ODS-GFS-00-001-R1	2. Scope	ed	Typo "The customer shall design and install the substation using indoor Gas Insulated Switchgear (GIS) technology in line with the EirGrid Functional Specification..."	Noted. Specification updated		Accepted
Innogy	20.	ODS-GFS-00-001-R1	2. Scope	ct	If the ownership boundary is at the termination of the export cable (likely operating at 220kV) into the HV switchgear then would the developer still have to comply with the Eirgrid HV switchgear specification? If not, revise the clause.	No change is foreseen in updated specification	The customer is expected to design and install the offshore substation using indoor Gas Insulated Switchgear (GIS) technology in line with the EirGrid Functional Specification for 110/220/400kV Gas Insulated Switchgear (GIS) XDS-GFS-25-001. As the infrastructure may in the future form part of the transmission system, the purpose is to ensure the equipment is Transmission system compliant.	Clarified

A green box implies the comment was accepted and incorporated.
An orange box indicates a comment was clarified.
A red box implies a comment was reviewed and excluded from revised spec.



Submitted by	No	Document	Section number	Type of comments	Comments	Proposed change	Observations of EirGrid / ESNB	Response Category
Innogy	21.	ODS-GFS-00-001-R1	2. Scope	te	Suggest the wording with regard to consequences of failures reflects the exact wording within DNVGL-ST-0145 and is not absolute.	Clause updated as follows: "As far as is reasonable practicable...."	Noted and accepted.	Accepted
Innogy	22.	ODS-GFS-00-001	6. Service Conditions	te	The specification asks for indoor equipment to be located in controlled and regulated environment. In view of this, is necessary to further define the service conditions air temperatures	The clause shall be updated as follows: "The air temperature for outdoor and indoor equipment should be selected from EN 62271-1 and consistent with the environment where the equipment is situated. are outlined in the Service-Conditions-section of the EirGrid-110 / 220 / 400kV Station-General Requirements Specification XDS-GFS-00-001. "	Propose to change to "The air temperature for outdoor and indoor equipment should be selected from EN 62271-1 and consistent with the environment where the equipment is situated.	Accepted
Innogy	23.	ODS-GFS-00-001-R1	7.2.2 Reliability	te	Given wind turbines are typically certified for a 25 year design life is it economic and efficient to build the offshore substation for a much longer lifetime? Think about reducing to 30 years to give some margin for commissioning and decommissioning of the various wind turbines.	No change is foreseen in updated specification	Comment noted and will be considered further as wind industry in Ireland progresses. EirGrid has received no indications currently that these substations cannot meet the requirements set out, 40 years lifetime will likely remain as a requirement.	Declined
Innogy	24.	ODS-GFS-00-001-R1	7.2.4	te	Presumably there is no detailed methodology to calculate the average accessibility level of >90%? Initial calculations we have performed based on an existing windfarm suggest 90% accessibility may be challenging. Have Eirgrid performed calculations using site specific data to give comfort the 90% is achievable?	Clause to be updated as follows: An The average year accessibility level >90% to the platform is necessary and shall be demonstrated agreed with Eirgrid using appropriate site survey data.	Noted and accepted.	Accepted
Innogy	25.	ODS-GFS-00-001-R1	7.2.4	te	What are the agreed sea states that the lifting equipment needs to operate within?	No change to specification is foreseen.	If the platform can be accessed within constraints agreed, equipment must be usable under those conditions. Conversely, there is no need for the equipment to be operable for conditions under which the platform is not accessible.	Clarified
Innogy	26.	ODS-GFS-00-001-R1	7.2.4	te	Consider being less prescriptive as regards what legislation may prescribe.	Clause to be updated as follows: "Statutory requirements shall be met regarding stipulate the provision of an alternative helicopter routes, presence of life-boats and availability of secondary escape routes (i.e. ropes, ladders, access, platforms, decent-to-sea system) for evacuation purposes."	Noted and accepted.	Accepted
Innogy	27.	ODS-GFS-00-001-R1	7.2.5	te	I am not sure of what is required by Irish law but in the UK I would not expect stranded mariners to have access to the temporary refuge. Maybe the wording here needs to be changed. There is some guidance in MGN 543 "Safety of Navigation: Offshore Renewable Energy Installations (OREIs) - Guidance on UK Navigational Practice, Safety and Emergency Response". on this in section 3.3.	Clause to be updated as follows: "Statutory requirements shall also be met for provision of a temporary refuge area for a "distressed" (stranded) mariner."	Noted and accepted.	Accepted
Innogy	28.	ODS-GFS-00-001-R1	7.2.7 Maintenance	te	Suggest removing the requirement to over specify equipment and in view of trying to achieve the Least Cost Technically Acceptable Option.	utilization (over specification) of plant and equipment;	Noted and accepted.	Accepted
Innogy	29.	ODS-GFS-00-001-R1	7.2.7	ed	Minor typo	Text updated.		Accepted
Innogy	30.	ODS-GFS-00-001-R1	7.2.9	te	Suggest clarifying that surfaces such as stainless steel do not need to be coated	Clause to be updated as follows: "All exposed external surfaces shall be protected by tried and tested marine paint coating systems applied to existing offshore oil and gas installations unless made of a corrosion resistant material."	Noted and accepted.	Accepted
Innogy	31.	ODS-GFS-00-001-R1	7.2.10	te	Unclear what containment system would be used for gas can more explanation be provided?	No change is foreseen in updated specification	It is normal to ventilate gas storage areas (or areas where gas may be released) rather than contain. The exception would be where release to atmosphere is prohibited. If SF6 is released due to an accident then there is no requirement to contain and recover. In fact, such a design would open up a number of safety issues. No SF6 should be released as part of any planned intervention. Under European agreements the gas must be recovered and recycled/reused. Consider adding words to this effect in the specification	Accepted
Innogy	32.	ODS-GFS-00-001-R1	7.2.10	ed	Is there a typo here?	Clause updated as follows: "Items such as transformer oil and battery systems acid are not typically stored on the platform with the exception of maintenance periods."		Accepted

A green box implies the comment was accepted and incorporated.
An orange box indicates a comment was clarified
A red box implies a comment was reviewed and excluded from revised spec.



Submitted by	No	Document	Section number	Type of comments	Comments	Proposed change	Observations of EirGrid / ESBN	Response Category
Innogy	33.	ODS-GFS-00-001-R1	7.2.11	te	EN/IEC 62305 is not applicable to offshore installations. Would an offshore standard such as DNV-OS-D201 or IEC 61892-6 be more applicable?	Clause updated as follows: "The lightning protection design shall be assessed, dimensioned and installed in accordance with EN/IEC 62305 parts 1-4 DNV-OS D201."	Noted and accepted.	Accepted
Innogy	34.	ODS-GFS-00-001-R1	8.1	te	Siemens have recently introduced "clean-air" insulation at 66kV (Siemens 8VM1 switchgear). Suggest changed the wording to allow use of this and future switchgear which does not use SF6 gas.	Clause updated as follows: "Alternative technologies such as AIS and MTS will not be considered. The HV switchgear type that shall be utilized is metal-enclosed gas insulated type. SF6 (Sulphur Hexafluoride)."	Comment noted and specupdated.	Accepted
Innogy	35.	ODS-GFS-00-001-R1	9.5	te	Consider if there any possibility of a future offshore metering point therefore requiring suitable VTs and CTs offshore?	No change is foreseen in updated specification	Tariff/Revenue Metering Current and Voltage transformers shall be provided for connection to Customer Revenue Meters. This equipment will be installed and located in the onshore network substation, details of which will be provided in the project specific operational specifications.	Accepted
Innogy	36.	ODS-GFS-00-001-R1	9.6	te	Is full coverage of every room of the offshore substation required or is coverage of major equipment and approaching vessels adequate?	Minor updates to this paragraph made in revised spec to clarify. Additional text inserted: CCTV and associated security system shall be provided in order to allow remote monitoring of: • The Personnel for safety reasons; • Monitoring of vessel approaching the platform and; • Monitoring of equipment. The design of the system shall provide safety monitoring to comply with legislation enacted by the statutory authority responsible for offshore installations. In the design and construction of the surveillance system, the reliability and availability of the system shall consider the climatic conditions envisaged.	Assuming this is in relation to the "an audible and visual alarm system". The requirement is for personnel to be made aware with an appropriate mechanism of abnormal conditions on the platform. It will be subject to detail design on whether that requires full coverage of every room however the system is required to alert personnel in any accessible location on the platform. If its relating to CCTV: The last statement in the paragraph "strategic location of CCTV..." should also help clarify query.	Accepted
Innogy	37.	ODS-GFS-00-001-R1	9.8	ed	Missing words?	Clause rearranged as follows: "A methodology (HAZID analysis) detailing the fire protection strategy (safety philosophy and design principles) must be provided. The methodology shall also include the objectives set out by the •Passive Fire Protection (PFP) system – prevention of fire escalation, protection of personnel (temporary safe area), structural integrity; •Active Fire Protection (AFP) system – fire and gas detection systems, i.e. extinguishment and control, damage limitation, etc; Installation of fire detection and fire alarm systems shall be in accordance with DNVGL-OS-D301 and EN 54."	Noted.	Accepted
Innogy	38.	ODS-GFS-00-001-R1	10.2	ed	Typo	Clause to be updated as follows: "Equipment which has been thoroughly tested onshore shall be subjected to the minimum offshore testing required to verify that the equipment has not been damaged in transit and that it is functioning correctly".	Noted.	Accepted
Innogy	39.	ODS-GFS-00-001-R1	N/A	te	Presumably Eirgrid will not insist on certification of the structural design?	No update to be made to spec.	Eirgrid will not form part of the certification process in the structural design.	Clarified
ESBI	1.	ODS-GFS-00-001-R1	2	ge/te	Does this document refer to the whole substation/structure or just to an EirGrid part of a structure owned by someone else e.g. no mention of transformers? Where something is specified e.g. batteries does the requirement apply only to the HV equipment or for the whole substation?	Clause updated as per previous similar comment.	"The following functional specification outlines the general requirements for a High Voltage AC Offshore Substation". Customer Transformer and Medium Voltage switchboard would fall under the Customers responsibility and not specified under the TSO requirements. Where something is specified, i.e. "batteries" these requirements relate only to the HV AC Offshore Substation.	Clarified
ESBI	2.	ODS-GFS-00-001-R1	2 and others	ed	Formatting inconsistencies throughout the document in regard to use of a space before units e.g. kV	Document revised with formatting reviewed.	Noted	Accepted
ESBI	3.	ODS-GFS-00-001-R1	6	ed	In 3 rd paragraph should 'exposed' be 'vulnerable'?	Proposed change accepted.	Noted and accepted.	Accepted
ESBI	4.	ODS-GFS-00-001-R1	7.2.1	ed	Use of 'should'? Should this be 'shall'?	Proposed change accepted.	Noted and accepted.	Accepted
ESBI	5.	ODS-GFS-00-001-R1	7.2.3	te	Back-up LT supply and power cable routing, handling & termination should be included	Clause to be updated to include the following: "Space shall be included for LV and HV power cable routing, handling and termination."	Noted and accepted.	Accepted

A green box implies the comment was accepted and incorporated.

An orange box indicates a comment was clarified

A red box implies a comment was reviewed and excluded from revised spec.



Submitted by	No	Document	Section number	Type of comments	Comments	Proposed change	Observations of EirGrid / ESN	Response Category
ESBI	6.	ODS-GFS-00-001-R1	7.2.3	te	Requirements for GIS room should include space for maintenance, repair & cable termination	Clause to be updated as per previous similar comment.	Noted and accepted.	Accepted
ESBI	7.	ODS-GFS-00-001-R1	7.2.4 & elsewhere	ed	Should 'statutory' be used rather than 'legislature'	Statutory to be used	Noted and accepted.	Accepted
ESBI	8.	ODS-GFS-00-001-R1	7.2.7	te	In last paragraphs the items to be considered are mentioned but required level of functionality is not specified	Clause to be modified to include: "...and shall align with good industry practice."	Noted and accepted.	Accepted
ESBI	9.	ODS-GFS-00-001-R1	7.2.10	ed	'diesel' should be 'diesel fuel oil'	Proposed change accepted.	Noted and accepted.	Accepted
ESBI	10.	ODS-GFS-00-001-R1	7.2.13	te	Two system studies are specified. Who is responsible for all other relevant studies e.g requirements for compensation or harmonic filtering, tap changer requirements, insulation co-ordination etc?	Clause was modified as follows: "All other system studies required for the design of the substation shall also be undertaken by the customer. Any other system studies as required by the Grid Code and Connection Agreement shall also be carried out."	Noted and accepted.	Accepted
ESBI	11.	ODS-GFS-00-001-R1	7.2.13	te	Potential requirement for neutral point treatment. Which neutral, HV or MV?	Clause modified to state: "Treatment of the MV neutral shall remain the responsibility of the Customer."	Noted and accepted.	Accepted
ESBI	12.	ODS-GFS-00-001-R1	8	te	Little mention of any condition monitoring requirements for primary equipment	New Clause added to state: "Condition monitoring shall be implemented where it provides a demonstrable reduction in maintenance requirements and is reliable in the offshore environment."	Noted and accepted.	Accepted
ESBI	13.	ODS-GFS-00-001-R1	8.1	te	Add reference to the cable specification for cable interface and hang-off requirements	Clause updated to include: "Cable terminations shall meet the requirements as specified in ODS-GFS-00-001."	Noted and accepted.	Accepted
ESBI	14.	ODS-GFS-00-001-R1	8.3	te	In the second paragraph the vibration damping method mentioned a definite requirements or an example of a possible method?	Clause updated to state: "In addition, vibration due to magnetostriction or "electric hum" from high power electrical devices (main transformers) can be transmitted to the platform causing maloperation of adjacent equipment. The customer shall demonstrate through calculation that risks associated with vibration due to magnetostriction or "electric hum" have been suitably mitigated."	Noted and accepted.	Accepted
ESBI	15.	ODS-GFS-00-001-R1	9	te	Little mention of any condition monitoring requirements for secondary equipment	New Clause added to state: "Condition monitoring shall be implemented where it provides a demonstrable reduction in maintenance requirements and is reliable in the offshore environment."	Noted and accepted.	Accepted
ESBI	16.	ODS-GFS-00-001-R1	9	ed	In 2 nd paragraph 'should' should be 'shall'?	This shall be amended	Noted and accepted.	Accepted
ESBI	17	OCDS-GFS-00-001	9	te	No requirements specified for M&E services including HVAC?	Clause added: "M&E Requirements shall be met as per EirGrid Specification XDS-GFS-14-001 and shall further be designed and demonstrated to be suitable for installation and operation in a marine environment."	Noted	Accepted
ESBI	18.	ODS-GFS-00-001-R1	9.2	te	Does specification of 220 V and 24/48 v batteries mean that non-digital control systems are a requirement?	No, batteries installed as per XDS-GFS-09-001		Clarified
ESBI	19.	ODS-GFS-00-001-R1	9.2	te	Specification requires 1 charger per battery. Agreed current ESN/EirGrid practice is for two chargers per battery?	EirGrid's latest Battery Functional Specification XDS-GFS-09-001 is referenced which requires duplicate battery systems and chargers.		Clarified
ESBI	20.	ODS-GFS-00-001-R1	9.2	te	Allowing VRLA batteries would seem to go against the general specification requirement for maximum lifetime and minimum maintenance?	Clause modified/removed.	Noted and accepted.	Accepted
ESBI	21.	ODS-GFS-00-001-R1	9.2	te	VRLA batteries have a more onerous environmental requirement than the other types?	Clause modified/removed.	Noted and accepted.	Accepted
ESBI	22.	ODS-GFS-00-001-R1	9.3	te	Is 'MV' the wind turbine collection busbar?	Yes, MV refers to all high voltage equipment downstream on the secondary customer side of the Power Transformer.		Accepted
ESBI	23.	ODS-GFS-00-001-R1	9.3	te	Is reference to generator for one dedicated to the HV substation auxiliary supply backup?	Yes.		Clarified
ESBI	24.	ODS-GFS-00-001-R1	9.8	te	To functional requirements specified?	This is as per the original specification. Unsure what question is asking. No change is foreseen in updated specification.		Declined
Siemens	1.	ODS-GFS-00-001-R1	2		Note most connections in the UK Offshore Wind Farms are 132 or 220kV. 110kV has not been deployed at an export voltage.	No change is foreseen in updated specification	110kV is an export voltage in Ireland, and therefore the specifications account for same.	Declined

A green box implies the comment was accepted and incorporated.
An orange box indicates a comment was clarified.
A red box implies a comment was reviewed and excluded from revised spec.

Submitted by	No	Document	Section number	Type of comments	Comments	Proposed change	Observations of EirGrid / ESNB	Response Category
Siemens	2.	ODS-GFS-00-001-R1	4		We'd recommend a level of flexibility in the hierarchy of standards to ensure that any lessons learnt from the deployment in the UK waters can be mapped across to these projects to avoid over-design & expensive solutions.	No change is foreseen in updated specification	Deviations from Standards may be requested on a project by project basis. Lessons learnt are best fed into standards committees. Any lessons learned that are available can be submitted to EirGrid and they can be considered.	Declined
Siemens	3.	ODS-GFS-00-001-R1	6		Bore samples taken at the location of the substation will be required – equally, the consideration of an interpretive report for all climatic/meteorological conditions will be needed by Contractors to perform the design work.	Noted. Clause to updated to include: "Bore sample shall be taken and a Geotechnical Interpretive Report for all climatic and meteorological conditions above shall be issued and used for the design process."	Noted and accepted.	Accepted
Siemens	4.	ODS-GFS-00-001-R1	7.1		Electro Magnetic Fields will need to be considered as part of the Electrical Environment also.	Change made to add "electro-magnetic fields" in sub-bullets under Electrical Environment.	Noted and accepted.	Accepted
Siemens	5.	ODS-GFS-00-001-R1	7.2.2		Currently assets in operation have design life of 20-40 years.	No change is foreseen in updated specification	Comment noted and will be considered further as wind industry in Ireland progresses. As there are no indications currently that these substations cannot meet the requirements set out, 40 years lifetime will likely remain as a requirement.	Declined
Siemens	6.	ODS-GFS-00-001-R1	7.2.3		Emergency Accommodation & Temporary Refuge could be the same – avoid multiple rooms without a core functionality will potentially lead to over-design.	Noted. Text to be added to state the two rooms may be the same.	Noted and accepted.	Accepted
Siemens	7.	ODS-GFS-00-001-R1	7.2.3		HV/AC – if this is required, on new offshore solutions we do not deploy a centralised HV/AC on the asset.	Clause updated to include: "A HVAC system shall be provided for temperature and humidity control. The system may be centralized or decentralized and shall be demonstrated to be suitable for operation within a marine environment."	Noted and accepted.	Accepted
Siemens	8.	ODS-GFS-00-001-R1	7.2.3		Storage rooms are generally not deployed on the platform, spares are kept onshore where conditions for the spares can be maintained & guaranteed in a central spare facility.	Text change "Storage area for spares equipment shall be considered (portable devices e.g. trolleys, lifting frames, SF6 gas handling truck, etc);	Noted.	Accepted
Siemens	9.	ODS-GFS-00-001-R1	7.2.3	ge	Filter banks are not deployed on the offshore platform – these present a significant design challenge given these are often defined late in the design process and given the filters are Air insulated technology, this can have a significant design impact on size/cost & the electrical/physical environment. Filtering is performed at the onshore substation in nearly all EU & UK projects.	No change is foreseen in updated specification Filters replaced with "reactors".	The text refers to "if applicable". We understand filters are normally installed on-shore.	Accepted
Siemens	10.	ODS-GFS-00-001-R1	7.2.3	ge	Fire fighting is known as fire suppression systems. If mineral oil is removed of the platform and replaced with Synthetic Ester liquid (e.g. MIDEL) then we are able to remove fire suppression systems as the risk of explosion/sustained fire is reduced to a risk less than the risk of asset/transformer failure.	Clause to be updated to include: "A Fire Suppression System shall be installed commensurate with the outcomes of a Fire Risk Assessment to be undertaken by the customer."	Noted and accepted.	Accepted
Siemens	11.	ODS-GFS-00-001-R1	7.2.3	ge	We are trying to reduce the deployment of large boom cranes given the large Operational Expenditure & specialist resources needed to operate them. Our latest offshore designs only utilise a davit crane – the same as found on the turbines.	No change is foreseen in updated specification	Boom cranes are not explicitly stated in the specification. Point is noted.	Declined
Siemens	12.	ODS-GFS-00-001-R1	7.2.4	ge	We are generally seeing vessel/CTV access to the offshore locations. We utilise a heli-hoist on our designs, owing to the risk of transfer with helicopters – the general trend is not to use a helicopter unless essential. Note lightweight substation designs currently do not allow for a heli-deck just a heli-hoist area.	Clause updated as follows: "Platform access and transfer shall be by sea (boat landing). Any provision for air access (heli-deck or heli-hoist) shall be considered on a project specific basis."	Noted and accepted.	Accepted
Siemens	13.	ODS-GFS-00-001-R1	7.2.13	ge	System studies, we have seen a full deployment of steady state, transient & dynamic studies are required in order to design the connection.	Clause updated as per previous similar comment. "All other system studies required for the design of the substation shall also be undertaken. Any other system studies as required by the Grid Code and as requested in the TSO Connection Agreement shall also be carried out."	Noted and accepted.	Accepted

Submitted by	No	Document	Section number	Type of comment	Comments	Proposed change	Observations of EirGrid / ESBN	Response Category
Siemens	14.	ODS-GFS-00-001-R1	9.3.	ge	Auxiliary Power: We would also consider the ability to back-feed power from the grid to the offshore substation. Diesel generators/Batteries would only cover essential loads on the platform and would not provide power for the turbines from the offshore substation.	Clause updated to include: "The back-up supply shall cover essential loads on the platform and is not required to provide back-feed to the turbines."	Noted and accepted.	Accepted
ESBN	19	OCDS-GFS-00-001	5.1.1		reduce the experience with installation requirement to 50km proved the factory have extended experience in HV cable production	Clause modified: Service experience shall be minimum five years experience associated with production and installation of high voltage cables. Experience with the installation of submarine cables (minimum 50km) for the relevant voltage level of the cable in at least one EU utility is also required	Noted and accepted.	Accepted
ESBN	20	OCDS-GFS-00-001	6		remove cycle load rating design philosophy. Align the rating calc requirements to onshore projects and to EG/ESBN policies.	Cycle load rating calc removed. After internal consultations and discussions at meetings with ESBN, it was determined appropriate to use the MEC as continuous load for cable rating calculation for the steady state.	Noted and accepted.	Accepted
EirGrid	21	OCDS-GFS-00-001	general		change the title to cover all submarine cables	Title chanced to: OCDS-GFS-00-001-R1 SubmarineCables Functional Specification	Noted and accepted.	Accepted
EMP-CT	1	ODS-GFS-00-001-R2	6.2.3	General	The section has reference to Emergency Overnight Accommodation, to Temporary Refuge and to welfare facilities. The required level of provision in each of these areas should be specified further as different approaches have been implemented to date from extremely basic upwards	In Normally Unmanned Installations (NUI), the welfare / emergency requirements are expected to be basic on the basis that they would rarely be used. Spec has been update in section 6.2.5 to incorporate this comment.	Noted and accepted.	Accepted
EMP-CT	2	ODS-GFS-00-001-R2	6.2.3	General	Additional space shall be provided'... Change to 'adequate space and include 'for all potential repair and equipment replacement and for HV testing'	Update incorporated as outlined.	Noted and accepted.	Accepted
EMP-CT	3	ODS-GFS-00-001-R2	6.2.4	General	typo'decent'	noted	Noted and accepted.	Accepted
EMP-CT	4	ODS-GFS-00-001-R2	6.2.5	General	Requirement to meet 'statutory' requirements to be reviewed to determine what is an acceptable minimum level of provision. See above comment on 6.2.3	In Normally Unmanned Installations (NUI), the welfare / emergency requirements are expected to be basic on the basis that they would rarely be used. Spec has been update in section 6.2.5 to include minimum requirements.	Noted and accepted.	Accepted
ESB - BL	1	ODS-GFS-00-001-R2	7.1	HV Switchgear	Suggest that (i) Eirgrid review GIS functional spec re. corrosion protection and moisture ingress at GIS flanges and (ii) This requirement is emphasised in Offshore spec section 7.1	Noted, reference to C5-VM, NORSOK standards and DNVGL-OS-C101 are all referenced.	Noted and accepted.	Accepted
ESB - BL	2	ODS-GFS-00-001-R2	9.3	Commissioning	Should a listing of commissioning requirements for HV plant & aux systems be included	A pointer to the EirGrid pre-commissioning requirements is referenced to incorporate this comment.	Noted and accepted.	Accepted