FIVE ESTUARIES OFFSHORE WIND FARM

10.20.4 TECHNICAL NOTE: ONSHORE CIVILS AND ELECTRICAL

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In preparation of this document Five Estuaries Wind Farm Ltd has made reasonable efforts to ensure that the content is accurate, up to date and complete for purpose.

Revision	Date	Status/Reason for Issue	Originator	Checked	Approved
A	Oct-24	Deadline 2	VEOWF	VEOWF	VEOWF

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FIGURES AND TABLES

1. CONTEXT

1.1.1 To aide the understanding of the works the ExA has requested a Technical Note providing further description of the onshore civil engineering work for the electrical infrastructure specifically aimed at providing background information on a range of topics / questions:

1.1.2 It should be noted that this note is provided as an explanatory document only in order to aide understanding of the typical construction process. It does not make any commitments or influence the Maximum Design Scenario which is provided in the Onshore Project description [AS-004].

1.2 ACRONYMNS & DEFINITIONS

1.2.1 For ease a list of commonly used acronyms related to this document is provided below

OnSS	Onshore Substation
ExA	Examination Authority
NGET	Nation Grid Electricity Transmission
NF	North Falls
VE	Five Estuaries
TCE Guide	Guide to an offshore wind farm; The Crown Estate (TCE) 2019

1.2.2 For ease a list of the relevant documents from the DCO library is provided below:

AS-004	6.3.1 Onshore Project Description
APP-069	6.2.1 Offshore Project Description
APP-087	6.3.5 Ground Conditions and Land Use
APP-089	6.3.7 Archaeology and Cultural Heritage
APP-098	6.4.3 Inter-relationships
REP1-041	9.21 Code of Construction Practice
APP-256	9.23 Outline Onshore Written Scheme of Investigation
REP1-008	3.1 Draft Development Consent Order
REP1-010	3.2 Explanatory Memorandum
APP-066	6.1.4 Site Selection and Alternatives

2. CAH1 – ACTION POINT 2

2.1 AN ESTIMATE OF THE TYPICAL DURATION FOR THE TEMPORARY POSSESSION REQUIRED TO UNDERTAKE TRENCHING, DUCT INSTALLATION AND CABLE PULLING WORKS BY REFERENCE TO AN APPROPRIATE LINEAR DISTANCE

2.1.1 Discussion on overall sequencing of the works and requirements for temporary possession for construction is presented within response to 1.2 and outlines that temporary possession of the land may be required for the entire construction programme. The actual works themselves would not be continuous within each section and there may be gaps between activities. Therefore, topsoil may need to be temporary stockpiled for the 18 to 27 month construction programme (noting that this does not imply trenches will be open for 18-27 months, but the temporary haul road may be required for this length of time).

2.1.2 General works required for cable installation are outlined within paragraphs 1.4.5, 1.4.6 and 1.4.7 of Volume 6, Part 3, Chapter 1: Onshore Project Description of the Environmental Statement (Application Document Number 6.3.1). Indicative durations for each activity based on previous projects are summarised below, actual durations expected for each activity would not be able to be confirmed until detailed design stage of the project.

SITE ENABLING WORKS

- Temporary fencing – approximately 18 days for 1km of onshore cable route.
- Upgrade of existing, or installation of new, access from the public highways, only where required – approximately 5 days per access location.
- Archaeological and ecological survey / mitigation works as necessary – duration dependent on constraints present and mitigation works required.
- Utility diversions and installation of temporary site drainage where required – duration dependent on extent of diversions required and length of temporary drainage required.
- Vegetation clearance – duration dependent on extent of vegetation clearance required.
- Establishment of TCC site compounds, which could include site offices, welfare facilities, security, wheel wash, lighting and signage – approximately 25 days per compound location.

MAIN CONSTRUCTION WORKS

- Temporary topsoil removal (to edge of working area) – approximately 25 days for 1km of onshore cable route.
- Temporary haul road installation along all sections of the route – approximately 25 days for 1km of onshore cable route.
- Trenchless duct installation beneath obstacles (such as major roads, railways, rivers and ecological features) – duration dependent on length of trenchless crossing, could be approximately 10 days for short trenchless crossings and 50 days for major trenchless crossings.

- Installation of header or interceptor drains at cable corridor boundaries – approximately 15 days for 1km of onshore cable route.
- Trench excavation (typically up to four trenches for scenario 1; or up to 2 trenches for scenario 2 and 3) – approximately 25 days for 1km of onshore cable route.
- Duct and tile installation (this may be by hand or using a specialist ducting trailer / machine) – approximately 25 days for 1km of onshore cable route.
- Trench backfilling – approximately 25 days for 1km of onshore cable route. This can be conducted sequentially with the duct installation hence it is not appropriate to add the 25 days together and trenches will not be open for 25 days at a time.
- Existing field drainage repairs (where disruption occurs) – approximately one day per repair.
- Jointing pit installation (including French drains to prevent water pooling above jointing pit) – approximately 10 days per joint pit location.

Cable installation

- Cable installation (pulled through ducts from each joint pit) – approximately 5 days per joint pit location.
- Cable jointing – Approximately 10 days per joint pit location.
- Cable testing and commissioning – approximately 5 days per joint pit location.

Reinstatement

- Removal of haul road – approximately 25 days for 1km of onshore cable route.
- Jointing pit ground reinstatement – approximately 2 days per joint pit location.
- Replacement of topsoil – approximately 25 days for 1km of onshore cable route.
- Landscaping and hedge re-planting, where appropriate – duration dependent on extent of landscaping and hedge re-planting required.
- Demobilisation and fence removal – approximately 15 days per 1km of onshore cable route for fence removal and approximately 20 days for compound and access demobilisation and reinstatement.

2.1.3 Some activities are likely to overlap and could be carried out by the same contractor, with others such as duct installation and trench backfilling following on immediately after excavation of a length of trench to minimise extent to which large open excavations are present onsite. The final construction programme and sequence would be developed at the detailed design stage of the project.

3. CAH1 – ACTION POINT 4

3.1 SUBMIT AN ESTIMATE OF THE ONSHORE LANDTAKE FOR THE PROPOSED FIVE ESTUARIES OFFSHORE WIND FARM AS A STANDALONE DEVELOPMENT (IE EXCLUDING NORTH FALLS FROM THE SCHEME FROM THE WORLD)

3.1.1 As described in section 1.4.1 of AS_004 the current plans include a typical construction corridor excluding the complex HDDs, and haul roads of 90m width for both Five Estuaries ("VE") and the second ducts.

3.1.2 Definitions of the Routing Corridor, Working Corridor and Easement are shown in Figure 1.

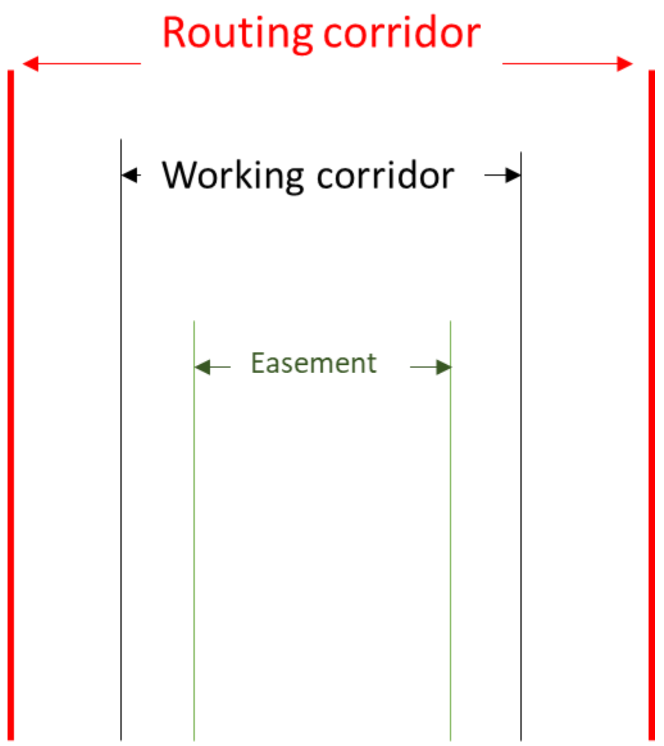

Figure 1 Definitions

3.1.3 The Routing Corridor is the wider corridor applied for at DCO application stage (i.e the Order Limits) and it has an allowance for micro routing. The Working Corridor will be defined post the detailed design surveys, and is the working corridor for the cable trenches / HDDs after routing is conducted and allows for temporary haul road and excavated soil stock piles; the Easement is the permanent easement above the cables after reinstatement, retained during operation.

3.1.4 The value of 90m for the routing corridor width was selected as it is the width required for both projects to conduct simple HDD crossings (based on cable spacing for burial at 5m depth, which is typical for minor road crossings). It was then used along the route where trenching will be conducted to allow for detailed design routing (micro siting of open cut sections) that can only be conducted after the detailed surveys have been conducted. Typically projects will need to avoid obstructions such as archaeology, geology, ecology & anthropogenic obstructions which are only know after the results are available from the full detailed surveys.

The actual working corridor for open cut trench sections after detailed design routing could be 60m for the case of Scenario 1 (one project installing the ducts for the other), and 38m for one project alone (as described in scenario 2 and 3). This is because only one temporary haul road would be used. Comparative values are set out in Table 1 highlighting how the values of the various widths change in the scenarios where VE installs the ducts for NF (scenarios 1) or not (scenario 2/3).

Table 1 Summary of comparative widths for the trenched sections of the onshore cable installation

Indicative trenching corridor width	VE Scenario 1 (VE installing ducts for NF)	VE Scenario 2/3 (ignoring north falls)
Routing Corridor	90m	45m
Working Corridor	60m	38m
Easement	20m	20m

3.1.5 As with the working corridor the final easement will be the same in all cases. This is 20m for VE alone, and 40m for the Option 1 build scenario where VE installs ducts for North Falls. The additional 20m would however be transferred to North Falls, leaving 20m for VE alone.

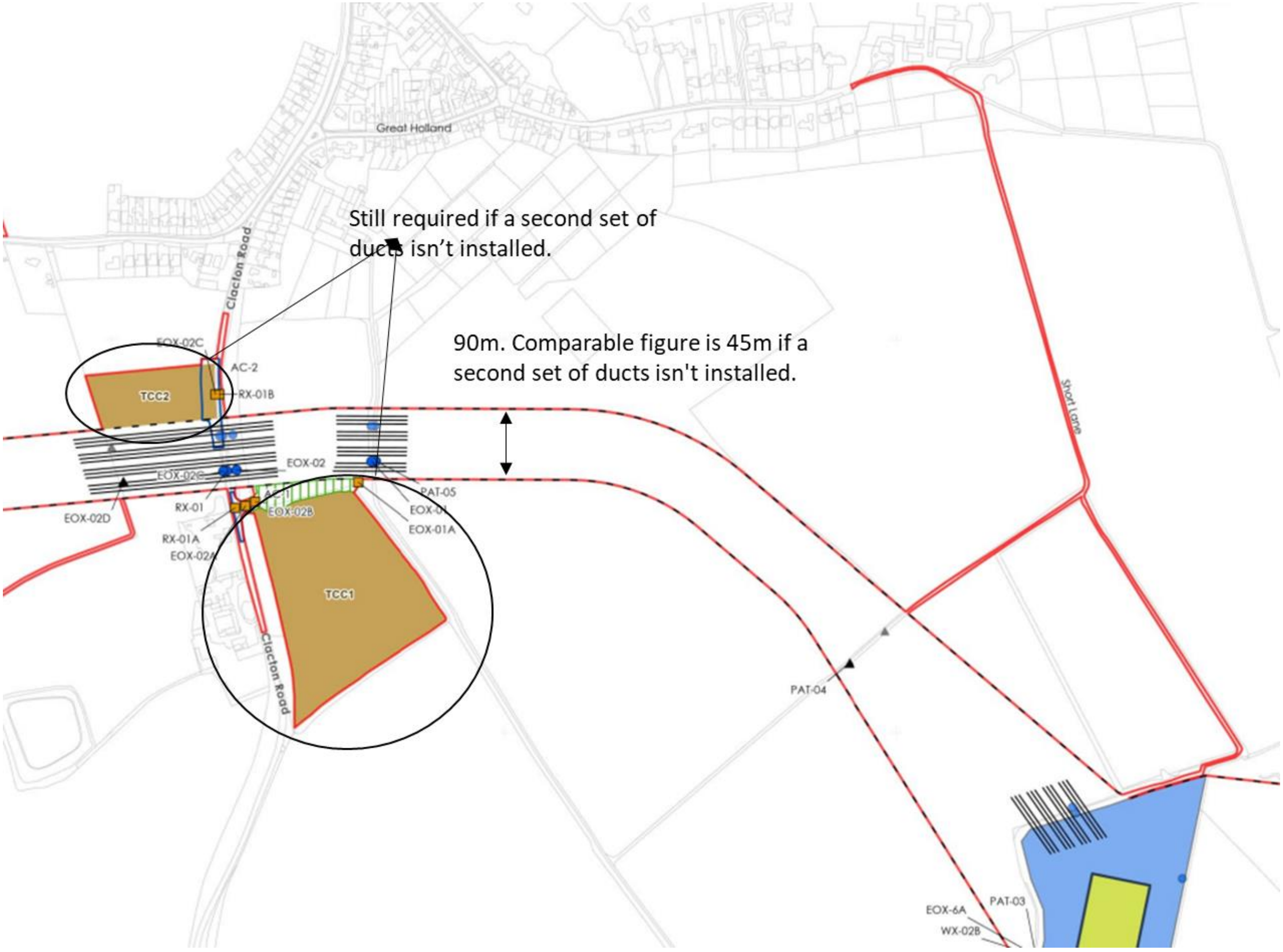

Figure 2 Example of reduction in Red Line Boundary / Routing Corridor

3.1.6 The corridor approach always allows for a wider area than is necessary to carry out the development in order to allow for detailed design and micro siting within the corridor. For context Rampion 2 project has 4 circuits (VE and NF together have a total of 4) and has Order Limits of typically 100m.

3.1.7 The Applicant cannot do a general narrowing because North Falls and Five Estuaries have completed the engineering works on the basis of “Project 1” and “Project 2” and have not identified which project is on which side of the corridor.

3.1.8 The reduction of the corridor is not as simple as reducing the width by x metres along the cable corridor extent. It should be noted that the accesses for the cable corridor construction are shared by both projects. If only one project proceeds then these will be needed in their entirety. Compounds are located on both sides and need to connect to the cable corridor, as do haul roads. TCCs are sized for the projects to be built out together. Access is taken from both sides of the corridor and would need to be retained in all locations, in effect widening back out to connect.

3.1.9 Additionally, Five Estuaries even in an uncoordinated build scenario cannot prevent the delivery of North Falls so cannot simply 'snake' the corridor from side to side to align with the accesses and compounds (cable bend restrictions could also restrict that approach). an explanation of the expected sequencing arrangements for undertaking the proposed onshore works (i.e. whether from one end to the other end of the cable corridor, a discrete sectional basis or some other basis).

3.1.10 The indicative construction programme for the onshore cable route works allows for construction over an 18 to 27 month duration within which activities will not be required within all site areas at the same time. Depending on final construction programme there may be multiple work fronts required in order to complete the works, therefore allowance for construction activities within all sections over the 18 to 27 month duration is needed to be retained.

3.1.11 General works required for cable installation are outlined within paragraphs 1.4.5, 1.4.6 and 1.4.7 of Volume 6, Part 3, Chapter 1: Onshore Project Description of the Environmental Statement (Application Document Number 6.3.1). These works within each section would not be continuous and there would be gaps between activities.

3.1.12 In simple terms the enabling works such as site preparation and access are conducted, then the trenches are excavated, the ducts are installed, the backfilling is conducted (but not all the topsoil), the cables are pulled (potentially by a separate contractor than the trenching), testing & commissioning are completed (but this must occur after the OnSS is complete), then final topsoil and reinstatement is conducted.

3.1.13 Completion of works (enabling works, duct and cable installation and full reinstatement) within each section is not possible before moving on to the next section as cables need to be pulled between joint bays of adjacent sections and therefore access to adjacent sections is needed at the same time. The cables may only be installed and connected immediately in advance of the project energization and therefore cable ducts for all sections needs to be installed in advance of this and access to joint bay locations within all sections retained for cable installation. As noted within paragraph 1.4.10 of the Onshore Project Description within some areas reinstatement can occur as soon as cable ducts are installed, such as between joint bays. The location of where this would be possible would only be able to be identified at the detailed design stage of the project post consent.

3.1.14 Seasonal restrictions for works in particular areas may be identified due to ecological or other receptors and avoidance of working within wet weather windows may be required (for example to protect soils). Therefore, the construction sequence of the works would also need to take account of these restrictions.

4. CAH1 – ACTION POINT 6

4.1 AN EXPLANATION FOR WHY THE PROPOSED FIVE ESTUARIES AND NORTH FALLS PROJECTS WOULD EACH NEED TWO CABLE TRENCHES WITH THREE POWER CABLES PER TRENCH (AS SHOWN IN THE COORDINATION DOCUMENT [APP-263])

4.1.1 Both projects have applied for 2 circuits (this was reduced from 4 that VE presented within its PEIR documentation). Each circuit comprises 3 cables, in line with the UK electricity system which operates a 3 phase, 50Hz, HVAC electricity system.

4.1.2 The amount of power that each circuit can carry is related to the cable conductor size and the cable voltage. The maximum cable core size is constrained by product availability, the ability to deliver large diameter cables to site and the ability to pull them through a cable duct (larger cables are more rigid and hence difficult to bend in a curve). In line with Joule's law of heating, the cable conductor gets exponentially hotter when transmitting more power; the insulation surrounding the cable has a temperature limit. Cables operating at temperature over the limit would result in cable failure. Five Estuaries has conducted studies evaluating the range of options that are likely to be available to the project and has concluded that up to 2 circuits (each circuit containing three cables) are necessary to transmit the amount of power the project will produce.

4.1.3 Electrical power is generated and transmitted by three-phase with phase angle at 120ºC to each other (called AC system), which enables a balanced and continuous flow of electricity and provides efficient power handling efficiency. The balanced nature of the power means that a fourth cable is not needed (the return wire in a normal system).

4.1.4 To for ease of install, onshore cable design is typical based around having 3 single core cables (one for each phase) as shown in Figure 3, rather than having one much larger cable comprising all three conductors (as is typically done offshore). This allows for more flexibility in routing. In the flat formation there would be three individual cables in each trench. In the trefoil formation the 3 cables may be combined into one conduit and hence it may looks like one cable with three-cores, though the outer diameter would be greater.

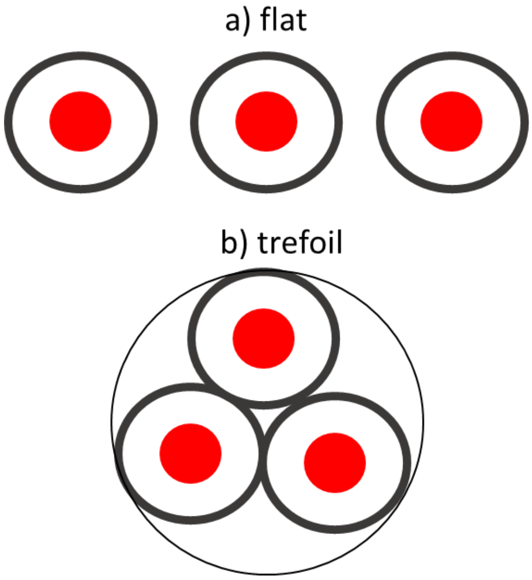

Figure 3 Flat and trefoil configurations

4.1.5 Each circuit requires its own trench to avoid cable overheating and electrical interference from each other. To avoid overheating and electrical interference a minimum distance must be maintained between the circuits. If a single trench was used it would not reduce the corridor width as the minimum distance would need to be maintained. This would result in a much larger / wider excavation and soil stockpiles created than by having separate trenches for each circuit.

4.1.6 The final choice of cable will be made in detailed design and will consider technical, commercial and practical (civil engineering and logistical) impacts.

4.2 ANY GEOMETRY LIMITATIONS FOR INSTALLING CABLES

4.2.1 The single core cables themselves would have a bending radius of around 2m as these are delivered to site on cable drums, example of which is presented as Figure 1.12 of Volume 6, Part 3, Chapter 1: Onshore Project Description of the Environmental Statement [AS-004]. The minimum bend radius of the cables does not govern the design of the routing.

4.2.2 The cables are generally to be installed within ducts and the minimum duct bending radius for open trenching is approximately 20m. The length of cable that can be pulled in is determined by the force needed to overcome the friction between the cable and ducts. Friction is increased by having a larger numbers of bends, and having tighter bends. Therefore, if bends are required, larger bend radii of the ducts are required to reduce cable pulling forces and allow joint bays to be as far apart as possible to minimize the impacts of joint bays (as the joint is generally a weak point in the cable) and link boxes, where maintenance access is typically required annually.

4.2.3 Additionally, the main export cable corridor needs to be suitable for vehicular movements along the proposed haul roads and therefore larger bend radii than the 20m minimum is required to allow routing of cable drum delivery vehicles along the export cable corridor. The export cable corridor has generally maintained a 150m internal bend radius reducing where needed due to avoid local constraints.

4.2.4 Due to the limitations of the steering of the drilling equipment the required horizontal and vertical bend radii for trenchless crossings is generally around 250m with lower bend radii suitable for short minor crossings. Therefore, larger bend radii have been allowed for where trenchless crossings are proposed at the bends in the export cable corridor.

4.3 WHY CABLE SHARING WOULD NOT BE POSSIBLE (I.E. WHAT WOULD DETERMINE THE NUMBER OF CABLES AND THEIR LAYOUT)

4.3.1 As indicated in 4.1.2 there is a maximum amount of power each circuit can carry. The common analogy is to consider the ability of cable cores to transmit power akin to the flow of water in a pipe. Power is the combination of the voltage (water pressure) and current (flow rate). The amount of power (water) the cable core (pipe) can transmit is hence constrained by its size and operating temperature.

4.3.2 It would not be technically possible for the projects to “share a single cable” given the combined power output of both projects. This is because National Grid will not allow a single cable connection for a power transmission over 1800MW to ensure a single failure will not cause blackouts.

4.3.3 Due to this, even if the projects were considered to be “merged” then the number of cables would be unlikely to change.

4.3.4 A second point is that the projects are separate (separate entities, separate grid connection agreements, separate leases etc). Because there is no feasible coordinated option each project will design and build it’s own transmission assets and then transfer these to an Offshore Transmission Owner (OFTO). UK law requires that energy networks are subject to ‘unbundling’ requirements which requires the separation of various stages of the energy supply chain (generation, transmission, distribution and retail). Thus, offshore wind farm developers must sell off the transmission assets once the wind farm (generation asset) is fully constructed and operational. The Electricity Act 1989 provides for the licensing and sale of the transmission assets to an OFTO through The Electricity (Competitive Tenders for Offshore Transmission Licences) Regulations 2015 (Tender Regulations). Each OFTO is a separate legal entity and the current Tender Regulations provide that the transmission assets for each offshore wind farm are licensed and sold independently of other projects. There is no mechanism under the current offshore regulatory regime to ‘share’ transmission assets between separate wind farms

4.4 AN EXPLANATION FOR WHY CABLE PULLING FOR THE PROPOSED FIVE ESTUARIES AND NORTH FALLS PROJECTS WOULD NEED TO BE UNDERTAKEN SEPARATELY AS OPPOSED TO A SINGLE WORK

4.4.1 Five Estuaries has chosen to include trenches excavation, horizontal directional drilling (HDD) and the installation of the onshore ducting on behalf of North Falls. North Falls has similarly included the reciprocal work within their DCO. Neither project has included for the pulling of the other project’s cables.

4.4.2 This arrangement is consistent with other offshore wind project projects currently under construction that are coordinating. For example Dogger Bank C and Sofia offshore wind farms.

4.4.3 There are technical reasons that underlie this, a key one of the reasons relate to the common causes of cable faults.

4.4.4 Common causes are transportation and installation damage, and manufacturing faults. Such faults may not become apparent until commissioning once the cable is installed. To avoid unnecessary interface and commercial risk it is common for the cable supplier to also be responsible for the cable pulling.

4.4.5 Each project is responsible for its own procurement strategy, financing and insurance hence it is not reasonable for the projects to pull each other's cables.

4.4.6 Secondly the equipment for conducting the HDDs, trenching and ducting is likely to be similar. It is hence efficient for the projects to conduct this work on each other's behalf and will result in lower level of impact as the various equipment is only being moved to site and used once.

4.4.7 The impacts caused by the cable delivery and pulling would not be similarly reduced as the same amount of cable will need to be delivered, and the equipment to pull the two project's different cables may differ.

4.4.8 A final commercial reason for this is that the costs for the installation of ducts may be covered by OFGEM's Anticipatory Investment (AI) mechanism. According to the Early Stage Assessment, for costs to be recoverable under this scheme they must be "economic and efficient". This process is still subject to ongoing regulatory updates / clarifications. Because of this there is no certainty, however it is the Applicant's understanding that conducting the HDD, trenching and duct installation for another coordinated project may pass this test, however procuring the cable and installation for another project may not.

4.4.9 Also, the programme and timing of cable installation would be different for the two Projects.

4.5 AN EXPLANATION FOR WHY THE PROPOSED FIVE ESTUARIES AND NORTH FALLS PROJECTS WOULD EACH NEED THEIR OWN ONSHORE SUBSTATIONS AND/OR WHY A SINGLE SUBSTATION SITE COULD NOT BE SHARED

4.5.1 Similarly to the explanation provided in 4.3.4 the projects are separate and under the ESO and OFGEM regimes they are required to provide their own transmission assets.

4.5.2 It is important to note that the detailed electrical design of the equipment will be specific for each circuit (and hence different for the two projects). The ancillary equipment needed e.g. STATCOMs and shunt reactors, are designed to the specific requirements of the circuit e.g. voltage and cable length to which it is connected. If common ancillary equipment was provided, additional equipment e.g. switchgear would be needed so that the reactive power can be split between the circuits. Therefore, to have common ancillary equipment does not necessarily save space (particularly as redundancy is needed to improve availability), but adds complexity and maintenance whilst reducing the overall substation availability (by having a common failure point). Therefore, equipment is generally provided per circuit, and hence the further amalgamation of circuits in a substation would not lead to any space saving.

4.5.3 Compared to North Falls, the VE offshore wind farm and array area is further from shore and hence will have longer export cables. As cables act as capacitors it is logical to assume that VE will have larger reactive power compensation requirements. Furthermore, the final sizes of the VE and NF wind farms may differ, and hence different sizes of STATCOMS will be required in order to be compliant with GB Grid Code requirements.

Given the difference in export cable lengths, the projects may also have different optimal voltages for the export cables, this means that the transformers to transform the power to 400kV would be different.

4.5.4 These types of difference mean that the projects cannot simply share equipment. even if the projects were considered to be "merged" then the number of items of equipment would be unlikely to change. Any space saving of a merged substation would be negligible.

4.5.5 The co-located site has been selected as it was identified by both projects at PEIR, and since then the projects have progressed work on a "co-located" substation basis to minimise overall impacts. This was in response to feedback from stakeholders during consultation.

4.5.6 By co-locating the OnSS the projects are sharing as much infrastructure as possible for two separate projects. Examples of this include;

- Common Access arrangements for temporary and permanent access (temporary haul roads & permanent access)
- Common drainage systems design

4.5.7 OnSS physically close to each other to reduce the total land area impacted by the works.

4.6 DIFFERENT VOLTAGE LEVELS (AND HENCE CABLE DESIGN) AN EXPLANATION FOR WHY A THIRD ONSHORE NATIONAL GRID ELECTRICITY TRANSMISSION SUBSTATION WOULD BE REQUIRED TO SERVE THE PROPOSED WIND FARMS

4.6.1 The project understands the question to be querying why there must be three OnSS (one NGET and one for each wind farm). The main reason is that they all have different functions.

4.6.2 National Grid need their own substation for constraint relief. The NGET EACN substation will be built by NGET and is part of the GB National Grid infrastructure and is part of "the Great Grid Upgrade" program, and meets the National Grid requirements for meeting that, minimizing cost to the customer. It is not proposed solely to serve the windfarms but is part of a wider project.

4.6.3 "The Great Grid Upgrade comprises 17 major infrastructure projects that will both scale up the grid and update our existing networks. It will enable us to carry more clean, secure energy from where it's generated – like out in the North Sea by wind turbines – to where you need it, boosting energy security and helping the nation become more self-sufficient." – quote from National grid website (https://www.nationalgrid.com/the-great-grid-upgrade)

4.6.4 The windfarms each need their own substation to condition the power so that it meets the requirements of the Grid (to make the windfarms Grid Code compliant). There is a Bilateral Connection Agreement between National Grid and Five Estuaries requires the power to be of a certain quality at this new substation.

4.6.5 Examples of the requirements of the GB Grid Code requirements are (this is a non-exhaustive list);

- Offshore Power Park Modules must be capable of maintaining zero transfer of reactive power at the offshore GEP at all active power output levels under steady state voltage conditions.
- The Grid Code requires that the wind farm shall be operated at any point inside the indicated range in **Figure 4**, continuously, over any voltage at the Transmission Interface Point between 95% and 105%.

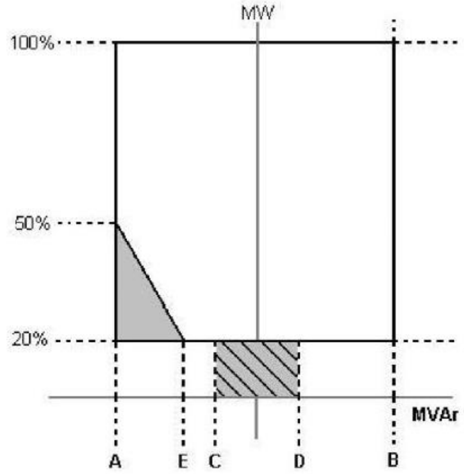

Figure 4 Reactive Power Capability Required by the Grid Code

4.6.6 Requirements such as these examples will govern the necessary equipment that must be present at the VE OnSS to "format" the power to be compliant with GB Grid Code.

The VE project has not determined the final voltage for the export system from the wind farm, however it is expected to be lower than 400kV. The VE OnSS will hence have to transform the energy from this lower voltage level to the 400 kV level.

5. CAH1 – ACTION POINT 7

5.1 WHICH PROJECT WOULD BE RESPONSIBLE FOR UNDERTAKING THE WORKS WITHIN THE EACN SITE TO CONNECT FIVE ESTUARIES TO EACN AND WHY THAT WOULD BE THE CASE

5.1.1 The interface point to the TSO (the point where VE "plugs-in" to National Grid) is the busbar hooks (if AIS), or the gas chamber (if GIS). There needs to be some works between the end of the cable (called the cable sealing end) and the interface point, for which VE is responsible. Five Estuaries is responsible for the design and installation of the necessary infrastructure to connect to the NGET EACN substation.

5.1.2 NGET has the responsibility of designing and constructing the overall EACN up to the interface points with the each of the different connections, and administering the grid connection process for generators such as VE.

5.2 THE EXPECTED SEQUENCING FOR UNDERTAKING THE WORKS NECESSARY TO PHYSICALLY CONNECT FIVE ESTUARIES TO THE PROPOSED EACN RELATIVE TO THE WIDER CONSTRUCTION OF THE EACN

5.2.1 Though the EACN project has not progressed to the same point as VE in the consenting process, it is expected that the EACN project will begin construction of the EACN substation first. This is because it does not need to secure a "route to market" such as a CFD.

5.2.2 The main tasks to connect the two substations includes:

- Trenchless crossing from the VE Substation area under Grange Road & hedgerows/ trees.
- Trenching from the VE 400 kV Switchyard at the project OnSS to the start of the trenchless crossing

5.2.3 Trenching from the end of the trenchless crossing to the VE allocated Connection Bay in the EACN Substation.

5.2.4 Carrying out the works outside of the EACN substation connection point based on finalised connection agreement with NGET EACN. This includes:

- Pulling of the cables connecting the two substations (which may involve a joint bay depending on the final distance between the two substations).
- Constructing the user bay at the EACN substation.
- Commissioning

5.2.5 The projects are currently developing the programmes and are actively coordinating to avoid clashes of civil engineering activities and minimise construction impacts, however detailed schedules are not available at this early stage.

5.2.6 The dependencies that will be considered in detailed design include;

- VE will need to know the location and orientation of the EACN OnSS Connection Bay and wider site layout (roads, planting, drainage etc) in order to finalize the HDD and trenching routes and design.
- The HDD and trenching activities can be conducted either before or after the main works at the EACN substation. The commissioning cannot be conducted until the electrical equipment is in place at both substations

5.2.7 The projects will continue to work together to coordinate the final scheduling as they progress.

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