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Bramford to Twinstead Reinforcement

Volume 6: Environmental Information

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nationalgrid

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1. Major Accidents and Disasters Scoping

1.1 Introduction

1.1.1 National Grid Electricity Transmission plc (here on referred to as National Grid) is making an application for development consent to reinforce the transmission network between Bramford Substation in Suffolk, and Twinstead Tee in Essex. The Bramford to Twinstead Reinforcement ('the project') would be achieved by the construction and operation of a new electricity transmission line over a distance of approximately 29km (18 miles), the majority of which would follow the general alignment of the existing overhead line network.

1.1.2 This appendix has been produced to outline the scoping assessment undertaken in relation to major accidents and disasters to support the application for development consent and the accompanying Environmental Statement (ES) under the Planning Act 2008.

1.1.3 The requirement to consider major accidents and disasters as part of the Environmental Impact Assessment (EIA) process was established by the amended EIA Directive (2014/52/EU). This is transposed into UK law by the Town and Country Planning (EIA) Regulations 2011, which state that:

'*A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned… Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.*'

1.1.4 For the purposes of this appendix, the term 'major accidents' is taken to include both major accidents and disasters. The assessment presented in this appendix considers two aspects: the vulnerability of the project to a major accident, and the potential for the project to cause a major accident.

1.2 Scoping Opinion

1.2.1 The Scoping Report (**application document 6.5.1**) presented the work undertaken to assess the potential risk of the project causing a significant environmental effect in the event of a major accident or disaster. The Scoping Report concluded that existing processes and standards are already in place to reduce the vulnerability of the project to major accidents and/or disasters. It also demonstrated that the project was unlikely to generate any likely significant effects on the environment if a major accident or disaster were to occur. On this basis, the Scoping Report (**application document 6.5.1**) concluded that major accidents and disasters should be scoped out of the ES.

1.2.2 The Planning Inspectorate noted in paragraph 3.3.13–14 of the Scoping Opinion (**application document 6.6**) that '*the Applicant should also make use of appropriate guidance (e.g. that referenced in the Health and Safety Executives (HSE) Annex to the Inspectorate's Advice Note 11) to better understand the likelihood of an occurrence and the Proposed Development's susceptibility to potential major accidents and hazards'.* Advice Note 11 (and the HSE Annex) (Planning Inspectorate, 2017b) and the relevant guidance referenced therein, was considered when undertaking the scoping assessment for major accidents and disasters.

1.2.3 The Planning Inspectorate confirmed in ID 14.12.2 of the Scoping Opinion (**application document 6.6**) that the project '*is unlikely to cause a major accident or disaster that would result in likely significant effects to the environment, as it will be subject to appropriate design measures and compliance with legislation and best practice, and in most instances, there is no source-pathway-receptor linkage to trigger such effects. This aspect can therefore be scoped out of the ES'.* However, the Planning Inspectorate noted that the outcome of the scoping exercise should be presented within the ES and this is what is documented within this appendix.

1.2.4 In addition, in respect of the vulnerability of the project to a major accident or disaster, the Planning Inspectorate noted in ID 14.12.1 of the Scoping Opinion (**application document 6.6**) that '*the Proposed Development is unlikely to be vulnerable to a major accident or disaster that would result in likely significant effects to the environment. However, it is noted that two existing major accident hazard pipelines, are identified by the HSE, which have not been specifically considered within the Scoping Report. The potential for the Proposed Development to be vulnerable to impacts arising from a major accident occurring at these pipelines should be considered and, where significant effects are likely, these should be assessed within the ES. The Inspectorate agrees that other matters relating to this aspect can be scoped out of the ES. The outcome of the scoping exercise should be presented within the ES'.* This is documented within this appendix.

1.2.5 The scoping baseline text for major accidents and disasters has been updated in Section 1.4 of this appendix in reference to the two major accident hazard pipelines (MAHP). For completeness, an additional row has been added to Table 1.1: Major Accidents and Disasters Scoping, to that originally presented in the Scoping Report. The third row of Table 1.1 underneath the subheading of 'manmade hazards' now specifically covers the high-pressure gas pipelines, with the general assessment of buried services covered in the fourth row of Table 1.1.

1.3 Updated Scoping Exercise

1.3.1 The scoping methodology was based on guidance contained in Major Accidents and Disasters in EIA: A Primer (Institute of Environmental Management and Assessment (IEMA) and Arup, 2020). Further details on the baseline data sources, the scoping methodology and the terminology used can be found in the Scoping Report (**application document 6.5.1**).

1.3.2 The assessment of major accidents focuses on the risk of extreme incidences and the potential for significant environmental effects as a result of those extreme incidences, i.e. those that could result in serious environmental effects, effects to human health, or welfare. Risk assessment and management in the UK is typically based on risk tolerability, with the focus on risk being *'as low as reasonably practicable'*. This appendix uses this term to describe where risks are already managed to a level where the risk is balanced against the trouble, time and money needed to control it (IEMA and Arup, 2020).

1.3.3 A significant environmental effect in relation to a major accident is defined as an event that *'could include the loss of life, permanent injury and temporary or permanent destruction of an environmental receptor which cannot be restored through minor clean-up and restoration'* (IEMA and Arup, 2020).

1.3.4 This appendix has drawn on existing regulatory requirements that need to be met when designing, building and operating new power lines. It also draws on the existing National Grid design standards and risk management tools to highlight the measures already in place to manage project risks through design, construction, operation and decommissioning.

1.4 Study Area

1.4.1 The consequences of major accidents could extend beyond the immediate environs of the project. A study area of up to 1km has therefore been established. The study area has been informed by professional judgement and based on the nature of the potential major accident or disaster identified, as well as the range of potential receptors present.

Potential Environmental Receptors

1.4.2 The potential receptors that could be affected by a major accident have been identified within the specific environmental topic chapters of the ES and, as part of maintaining a proportionate assessment, are not duplicated here. No additional receptors that would be relevant to the major accidents appendix have been identified outside of those set out within the ES.

Nearby Major Accident Installations

1.4.3 There are no sites that fall under the Control of Major Accident Hazard Regulations 2015 (COMAH) within 1km of the project. The nearest COMAH site (Cliff Quay) is situated approximately 6.1km east of the Order Limits. There are two high pressure gas pipelines classified by the HSE as MAHP that cross the Order Limits. The first is to the west of Burstall Hill (HSE reference 7424, known as Bramford/Langham) and the second is located to the east of the Stour Valley East Cable Sealing End (CSE) compound (HSE reference 7429, known as Great Cornard/Fordham). The location of the Stour Valley East CSE compound was relocated following discussions with Cadent (the gas supplier), to increase the distance between the CSE compound and the MAHP.

1.4.4 Both MAHP are orientated approximately north south and cross the Order Limits roughly perpendicular. Both pipelines are located within sections of the route that would consist of overhead lines and would involve limited below ground works. The project would also cross a number of other buried services.

1.4.5 Cadent Gas operates the two MAHP that cross the proposed overhead line sections. Cadent Gas has confirmed that they have no objection to the project (see Table 17.1 in ES Appendix 5.2: Response to Consultation Feedback (**application document 6.3.5.2**)), however they state that further consultation and engagement would be required as the project design is progressed, to take into account requirements for working in the vicinity of Cadent Gas assets.

1.5 Embedded and Good Practice Measures

1.5.1 ES Chapter 3: Alternatives Considered (**application document 6.2.3**) sets out how the project has, where practicable, avoided sensitive features such as urban areas and sensitive environmental sites through the options appraisal process. The Grid Supply Point (GSP) substation and the CSE compounds are located in Flood Zone 1, outside of areas of flood risk.

1.5.2 The project has been designed, and would be constructed, operated and decommissioned if applicable, in accordance with applicable health and safety legislation. All aspects of the project would comply with the provisions of the Health and Safety at Work etc. Act 1974 and all relevant subordinate legislation. The project would also prepare and maintain a health and safety policy and a detailed site-specific health and safety plan for during construction. Method statements, accompanied by safety risk assessments, would be produced to cover the construction activities. Once construction is complete, the project would be managed under National Grid operational plans.

Design and Construction

1.5.3 The project complies with design safety standards including National Electricity Transmission System (NETS) Security and Quality of Supply Standard (SQSS), which sets out the criteria and methodology for planning and operating the network. This informs a suite of National Grid policy and process guidance which contains details on design standards which must be met when designing, constructing and operating assets such as the components that make up the project. National Grid's Safety Rules and Guidance (National Grid, 2018) also sets out generic risk mitigation measures that apply to all work undertaken by National Grid.

1.5.4 The project falls under the Construction (Design and Management) Regulations 2015 (CDM Regulations). These place specific duties on clients, designers and contractors so that health and safety is considered throughout the life of a project, from its inception to its subsequent final demolition and removal. Under the CDM Regulations, designers are required to avoid foreseeable risks so far as reasonably practicable, by eliminating hazards from the construction, maintenance, and proposed use and demolition of a structure, reducing risks from any remaining hazard, and giving collective safety measures priority over individual measures.

Operation

1.5.5 If damage were to occur to either the underground cable or the overhead line during operation, the National Grid Protection and Monitoring system would detect the fault within milliseconds and the circuit would be instantly tripped to prevent any risk of electrocution or fire. National Grid would be aware of the fault almost instantly and would send a team to the site to undertake emergency repairs. National Grid also undertakes regular helicopter surveys of its network, using thermal imaging to detect faults early or risks to the network, which allows maintenance work to be planned and scheduled.

1.5.6 It is extremely unlikely that damage would occur to multiple cables, or to more than one overhead line circuit at the same time. If this were to occur, it could lead to the transmission line being out of operation for a period of time while repairs are made. The majority of connection issues can be rectified within days, due to National Grid responses and comprehensive plans in place to react to regional and national outages of electricity. In addition, the aim of the project is to reinforce the network in the region. This means that if the project were to be consented and built, there would be additional capacity within the network to allow for both planned maintenance events and emergency situations that cause damage to the network. Therefore, there would be less chance of widespread power failure as a result of the project, and therefore this would not result in a major accident or disaster.

1.5.7 This ES appendix has not considered effects as a consequence of widespread power failure following damage to either the overhead line and/or the underground cables, as it is not considered that any such effects would constitute a major accident.

1.5.8 This demonstrates that there are appropriate processes and procedures already in place that reduce the risk to a level that is as low as reasonably practicable. However, for transparency these are reviewed in more detail in Table 1.1 at the end of this appendix.

Decommissioning

1.5.9 Decommissioning of the project would fall within the requirements of the NETS SQSS, and existing National Grid policy and process guidance. National Grid's Safety Rules and Guidance (National Grid, 2018b) also sets out generic risk mitigation measures that apply to all work undertaken by National Grid, including decommissioning projects.

1.5.10 The decommissioning of the project falls under the CDM Regulations 2015. These place specific duties on clients, designers and contractors so that health and safety is considered throughout the life of a project, including its subsequent final demolition and removal. Under the CDM Regulations, designers are required to avoid foreseeable risks so far as reasonably practicable, by eliminating hazards from the demolition of a structure, reducing risks from any remaining hazard, and giving collective safety measures priority over individual measures.

1.6 Likely Significant Effects

1.6.1 The updated scoping assessment has focused on identifying the potential sources of a hazard that could result in a major accident, whether there are potential pathways to receptors that could cause a significant environmental effect, and finally, whether existing design measures, legal requirements, codes and standards adequately control the potential major accident.

1.6.2 The updated scoping assessment has shown that the existing design measures, legal requirements, codes and standards adequately control the potential major accident and/or disaster. Therefore, the project is unlikely to result in a likely significant effect during construction, operation or decommissioning, both in terms of the vulnerability of the project to a major accident and also when considering the potential for the project to cause a major accident.

Table 1.1 – Major Accidents and Disasters Scoping (Based on Hazard Identification Record Template in IEMA and Arup (2020))

Hazard/Event	Project Phase	Reasonable Worst Consequence If Event Occurred	Embedded/Good Practice Measures Already In Place	Could This Lead To A Major Accident Or Disaster With Existing Measures In Place?
Manmade Hazards				
Built structure collapse (falling onto overhead line)	Operation	If a building or other structure were to fall on the overhead line, this could cause the overhead line to be severed. This is unlikely to affect environmental receptors but could result in temporary power failure while the overhead line is repaired.	The current design shows that the overhead line would not be located near to existing structures. Land rights would be established, placing restrictions on what could be built under or near the overhead line to manage this risk going forward. National Grid undertake line inspections (by helicopter and walkover) to check the line is free from potential obstruction (e.g. buildings and vegetation) to further reduce the risk of line strike. If damage were to occur to the overhead line, this would be quickly detected and repaired, as set out in Section 1.5.	No – Scoped out
Built structure collapse (falling on a pylon)	Operation	If a building or other structure were to fall on a pylon, this could cause it to fall onto another building. This would cause direct damage to the feature through the impact of the fall.	Pylons are designed with a wide base and deep concrete foundations to provide a stable footing. The pylons are designed and maintained to existing safety standards that mean it is highly unlikely that a pylon would collapse if something fell on it. However, even if this were to occur, the overhead line would be located at least 80m from the existing 400kV overhead line to avoid any risk that a pylon could fall and damage the existing overhead line. The project's land rights would restrict development and structures that can be built near to pylons, and this also means that even if a pylon were to collapse it would not fall onto a nearby building or environmental receptor, as the land rights would limit such features.	No – Scoped out

Hazard/Event	Project Phase	Reasonable Worst Consequence If Event Occurred	Embedded/Good Practice Measures Already In Place	Could This Lead To A Major Accident Or Disaster With Existing Measures In Place?
Human error (buried strike to MAHP)	Construction	If a MAHP were to be struck by the project during construction it could cause harm to the workforce, and/or could affect nearby receptors through blast damage or pollution.	Two MAHP are located in sections where new overhead line is proposed. The pylons would be placed beyond the minimum distances provided by the service provider. No excavation is anticipated near to the MAHP and the works are likely to be limited to a temporary access route crossing the pipelines. The temporary works would be agreed with the service provider, through protective provisions and through existing safety controls embedded during the design and construction stages. Works would also take into consideration HSE guidance (2014), which provides advice on how to reduce any direct risks to people's health and safety, as well as the indirect risks arising through damage to services. These existing measures reduce the risk to as low as reasonably practicable for the project to cause a service strike through human error.	No – Scoped out
Human error (buried strike to existing buried services)	Construction	If a third-party buried service were to be struck by the project during construction it could cause harm to the workforce, and/or could result in another undesirable event depending on the type of service affected (e.g. loss of water supply, pollution incident from fuel pipeline).	The protection of buried services is achieved through existing safety controls embedded during the design and construction stages. These include analysis of up-to-date service information to identify the location of services, holding discussions with service providers to agree protective provisions and managing the risks to services through the project risk register. Measures to manage risk include undertaking service location surveys to track where services are located on the ground.	No – Scoped out

Hazard/Event	Project Phase	Reasonable Worst Consequence If Event Occurred	Embedded/Good Practice Measures Already In Place	Could This Lead To A Major Accident Or Disaster With Existing Measures In Place?
			Works would also take into consideration HSE guidance (2014), which provides advice on how to reduce any direct risks to people's health and safety, as well as the indirect risks arising through damage to services. These existing measures reduce the risk to as low as reasonably practicable for the project to cause a service strike through human error.	
Human error (damage to overhead line)	Operation	If a third party were to damage the overhead line, this could cause the overhead line to be severed. This is unlikely to affect environmental receptors but could result in temporary power failure while the overhead line is repaired.	Land rights would be established, placing restrictions on what could be built under or near the overhead line to manage this risk going forward. National Grid undertakes line inspections (by helicopter and walkover) to check the line is free from potential obstruction (e.g. buildings and vegetation) to further reduce the risk of line strike. If damage were to occur to the overhead line, this would be quickly detected and repaired, as set out in Section 1.5.	No – Scoped out
Human error (damage to underground cable)	Operation	If a third party were to damage the underground cable during operation, this could cause harm to the third party.	The underground cables are placed at a minimum depth of 0.9m (deep enough so as not to be affected by agricultural activities). The cables and ducts are placed in cement-bound sand with a tile over the top as added protection. The cable markers indicate the line of the underground cable. Landowners would be made aware of the route of the cable and associated land rights which would outline the activities that can take place over the cable. In the extremely unlikely event that the cable was damaged, the fault would be reported in milliseconds through the monitoring system and the system would be auto isolated, making it safe pending investigations.	No – Scoped out

Hazard/Event	Project Phase	Reasonable Worst Consequence If Event Occurred	Embedded/Good Practice Measures Already In Place	Could This Lead To A Major Accident Or Disaster With Existing Measures In Place?
Human error (crane operation)	Construction	If human error during construction were to result in a crane falling/toppling (used in the construction and decommissioning of the overhead lines and pylons), this could fall onto the existing 400kV line or a building causing it to collapse.	The new 400kV overhead line has been located at least 80m from the existing 400kV overhead line, which exceeds the maximum distance of a crane falling. This avoids a risk associated with a crane falling and damaging the existing 400kV overhead line during construction. The existing project risk register contains measures to reduce the risk of a crane falling during construction. These include positioning the crane at 90 degrees to the existing line to reduce the risk. In addition, geotechnical investigations would be undertaken to identify the stability/suitability of the ground beneath where the crane would be placed, having an appropriately designed crane base plate, and using trained staff to operate the crane.	No – Scoped out
Sabotage or arson (including terrorism)	Construction and operation	If the project were to be subject to sabotage or arson resulting in wilful damage to the overhead lines, underground cables, CSE compound or GSP substation, this could result in temporary power failure while the line is repaired.	The project is designed to avoid the risk of damage through sabotage and arson, and the risk of electrocution is also a further deterrent. The materials are resistant to damage and are not at risk of catching fire. During construction, the working area would be secured for example using security fencing, and only authorised personnel would be admitted to the working area. Outside of working hours, there would be a security guard to check for trespassers that could result in sabotage or arson. During operation, the GSP substation, the CSE compounds and pylons would be surrounded by security fencing to prevent trespass. Wilful sabotage of overhead lines is also very rare due to the perceived risk of electrocution that could result from this.	No – Scoped out

Hazard/Event	Project Phase	Reasonable Worst Consequence If Event Occurred	Embedded/Good Practice Measures Already In Place	Could This Lead To A Major Accident Or Disaster With Existing Measures In Place?
Transport disaster (aircraft)	Operation	If an aircraft were to crash within the study area, it could in theory collide with the project. This would be likely to cause severance of, or damage to the line, or damage to a pylon, the CSE compound or GSP substation, which could result in temporary power failure while the overhead line is repaired.	Any damage would be quickly detected and repaired as set out in Section 1.5. If in an extreme scenario the overhead line were to be damaged, the monitoring system would detect the fault within milliseconds and the circuit would be tripped to prevent risk of electrocution or fire.	No – Scoped out
Transport disaster (rail/train derailment)	Operation	If a serious train derailment were to occur on the Sudbury Branch Railway Line, it could cause damage to the underground cable proposed at this location. This would result in temporary power failure while the line is repaired.	The design of the railway crossing would be agreed with Network Rail and would comply with existing safety requirements, to protect the railway line. In addition, the depth of the crossing means that a train derailment at this location is unlikely to affect the underground cable due to the extent of earth coverage between the cable and the surface.	No – Scoped out

Hazard/Event	Project Phase	Reasonable Worst Consequence If Event Occurred	Embedded/Good Practice Measures Already In Place	Could This Lead To A Major Accident Or Disaster With Existing Measures In Place?
Transport disaster (road/multi-vehicle collision)	Construction and operation	Construction traffic would be required to use the road network during construction. Whilst there is accident potential, vehicle movements would be relatively low and temporary, and are a routine aspect of the public road network. If a road accident/collision were to occur near to the project during operation, there is potential for a secondary collision with nearby structures, including transmission infrastructure such as pylons, which could result in temporary power failure while the overhead line is repaired.	Construction traffic and routeing to and from the site during construction would be considered as part of contractor risk assessments. The Order Limits do not close any trunk roads or the strategic road network. Where the project crosses minor roads, the pylons and above ground features would not be positioned next to the road where they could be struck by a moving vehicle. Therefore, the project is not considered vulnerable to a road accident.	No – Scoped out
Pollution	Construction and operation	During construction, diesel would be transported to, and stored on site to fuel on-site plant and equipment. If there were to be a major leak/loss of containment, this could result in a pollution event affecting soil or nearby watercourses.	A volume of approximately 20,000 litres of diesel may be stored in the main storage compound during construction, and up to 2,000 litres at individual sites. The construction volumes are routine/typical for construction sites of this type. During operation, diesel volume requirements on site would be approximately 13,440 litres and would be containerised and self-bunded.	No – Scoped out

Hazard/Event	Project Phase	Reasonable Worst Consequence If Event Occurred	Embedded/Good Practice Measures Already In Place	Could This Lead To A Major Accident Or Disaster With Existing Measures In Place?
		During operation, volumes of oil are stored in the transformer of the GSP substation, which is designed with a secondary containment.	The Construction Environmental Management Plan (**application document 7.5**) sets out measures to reduce the risk of pollution (including diesel spills) during construction, including the use of a fully bunded tank (110% capacity) and details of the emergency spill procedures. Harm to humans would require either ingestion or repeated skin contact, neither of which would be expected to occur from release due to existing health and safety processes.	

Hazard/Event	Project Phase	Reasonable Worst Consequence If Event Occurred	Embedded/Good Practice Measures Already In Place	Could This Lead To A Major Accident Or Disaster With Existing Measures In Place?
Natural Hazards				
Flooding	Construction and operation	If serious flooding were to occur during construction, it could cause construction materials or plant to get flooded and increase the risk of pollution. If serious flooding were to occur during operation, it could cause damage to the GSP substation resulting in power failure. Development can also increase the risk of flooding elsewhere due to above ground features affecting floodplain capacity or flows.	The Flood Risk Assessment (FRA) (**application document 5.5**) assesses the vulnerability of the project to flood risk and the risk that the project could increase flood risk elsewhere. National Grid designs its infrastructure to either withstand a flood event or to be raised up out of the floodplain. There are limited floodplains in the vicinity of the project, and the above ground components such as the GSP substation and CSE compounds are located in Flood Zone 1 (low flood risk). Existing embedded measures include a trenchless crossing at the River Stour and River Box (EM-E05 and EM-G04 respectively) and overhead lines passing over floodplains. Good practice measures would also be in place during construction, such as avoiding storing material or stockpiles of soil within the Flood Zone 3 (W07 in the CoCP (**application document 7.5.1**)). The project is not considered to be susceptible to flooding and is unlikely to cause flooding elsewhere. This has been assessed in the FRA (**application document 5.5**) and there is considered to be no potential for flood risk in relation to the project to result in a major accident or disaster.	No – Scoped out
Extreme temperatures (high temperatures)	Operation	The underground cables are buried underground and insulated; therefore, these are not considered to be susceptible to extreme high temperatures.	The project is designed to existing National Grid standards, which include consideration of high temperatures. National Grid also undertakes regular inspections of the network using thermal imaging to assess damage from weather. This means damage caused by high temperatures would be identified and repaired prior to failure of the line.	No – Scoped out

Hazard/Event	Project Phase	Reasonable Worst Consequence If Event Occurred	Embedded/Good Practice Measures Already In Place	Could This Lead To A Major Accident Or Disaster With Existing Measures In Place?
		Overhead lines can be damaged through extreme high temperatures. Overhead lines can be subject to thermal expansion during extreme high temperatures, which can cause sag. This can lead to a reduction in the clearance over trees and other structures, which can increase fire risk.	The Electricity Supply Regulations 1988 require operators to maintain a minimum distance between power lines and the ground or structures. This includes potential temperature-induced sag. This is implemented through National Grid standards, which require projects to assess sag of the overhead line. National Grid undertakes regular inspections of the line to identify areas of planting which may require pruning to maintain a safe distance between trees and the overhead line. With these existing measures in place, the risk of sag causing fire is considered to be as low as reasonably practicable, and no further measures are required to mitigate the risk.	
Extreme temperatures (low temperatures)	Operation	Overhead lines can be damaged through extreme low temperatures, which could damage the overhead line. In addition, snow can add additional weight to overhead lines, causing damage. The underground cables are buried underground and insulated; therefore, these are not considered to be susceptible to low temperatures or snowfall.	Overhead lines are designed to withstand temperatures to as low as -25°C with no effects to operation (National Grid, 2007). National Grid also undertakes regular inspections of the overhead line using thermal imaging to assess damage to the overhead line from weather. This means damage caused by low temperatures or snow/ice would be identified and repaired prior to failure of the line. Therefore, the project is not considered to be susceptible to low temperatures to the levels that could be experienced in the UK.	No – Scoped out

Hazard/Event	Project Phase	Reasonable Worst Consequence If Event Occurred	Embedded/Good Practice Measures Already In Place	Could This Lead To A Major Accident Or Disaster With Existing Measures In Place?
Ground subsidence	Operation	Ground subsidence could cause a pylon to collapse or the underground cable to be damaged, which could result in temporary power failure while the line is repaired.	As explained in Scoping Report Chapter 17: Major Accidents and Disasters (**application document 6.5.1**), the project is located in an area with very low seismicity. Research suggests that the largest possible earthquake anywhere in the UK is around 6.5, which could cause damage to buildings. However, this would generally not be sufficient to cause land instability that may present a risk to pylons (with their deep foundations) or the buried underground cables. Geotechnical surveys have been undertaken on the project to understand the ground conditions beneath pylons and trenchless crossings. Areas of poor ground, liable to subsidence have been avoided where practicable. Where necessary, additional measures would be incorporated into the detailed design in accordance with National Grid design standards and as part of the project risk assessment. With these existing measures in place, the risk of ground subsidence causing damage is considered to be as low as reasonably practicable, and no further measures are required to mitigate the risk.	No – Scoped out

Hazard/Event	Project Phase	Reasonable Worst Consequence If Event Occurred	Embedded/Good Practice Measures Already In Place	Could This Lead To A Major Accident Or Disaster With Existing Measures In Place?
High winds/storm	Operation	Thunderstorms may result in heavy rainfall, winds and lightning, which could damage the overhead line and result in power failure.	Storms of sufficient severity to cause damage to infrastructure are very rare in the UK. Lightning could potentially strike above ground installations including pylons. However, these have earthing protection against lightning strikes as set out in existing Technical Standards (National Grid, 2007). Storms could be a source of high wind speeds. The underground cables would not be liable to the effects of high winds. Overhead lines could be subject to high wind speeds; however, these are designed to meet current safety standards. If in an extreme scenario the overhead line were to be damaged, the monitoring system would detect the fault within milliseconds and the circuit would be tripped. This would occur before the overhead line (conductor) hits the ground and there would be no resulting risk of electrocution or fire.	No – Scoped out
Tree falling on overhead line, CSE compound or GSP substation	Operation	If a tree were to fall on the overhead line, CSE compound or the GSP substation, this could cause the line to be severed. This is unlikely to affect environmental receptors but could result in temporary power failure while the overhead line is repaired.	The project design includes land rights over the land beneath the overhead lines and above the underground cables, within which trees cannot be planted. National Grid undertakes regular maintenance of this area to cut back trees that are at risk of interfering with the overhead line or establishing root systems to damage cables. If damage were to occur to the overhead line, CSE compound or the GSP substation, this would be detected and repaired as set out in Section 1.5.	No – Scoped out

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