# 6. Major Accidents and/or Disasters

## Introduction

6.1 This Chapter reports the outcome of the assessment of likely significant environmental effects arising from the Proposed Scheme in relation to major accidents and/or disasters.

6.2 The Chapter describes the technical consultation that has been undertaken during the EIA, the scope of the assessment and assessment methodology, and a summary of the baseline information that has informed the assessment.

6.3 In line with **Chapter 2: Approach to EIA**, the assessment reports on the likely significant environmental effects, the further mitigation measures required to prevent, reduce or offset any significant adverse effects, or further enhance beneficial effects. The conclusions are provided both in terms of the residual effects and whether these are considered significant. The assessment of effects takes into consideration both primary and tertiary mitigation (see **Chapter 2: Approach to EIA** for further details) and is informed by the EIA Scoping process (**Appendix 2.1**) and iterative scoping process where applicable.

6.4 This Chapter, and its associated **Appendix 6.1**, is intended to be read as part of the wider ES with particular reference to the introductory Chapters of this ES (**Chapters 1 – 5**). In particular, **Chapter 2: Approach** to EIA sets out the linkages of the Application and ES with other consents/permits.

6.5 In addition, this Chapter should be read in conjunction with **Chapter 14: Assessment of Cumulative Effects**.

6.6 To note, for this technical topic, the focus is on the risk of major accidents and disasters and controlling it to 'as low as reasonably practicable'.

## Summary of Consultation

6.7 No consultation has been undertaken for the preparation of this Chapter. However, it should be noted that the Applicant has consulted with the Health and Safety Executive (HSE) regarding the Proposed Scheme to identify requirements for submissions to the HSE as part of the Control of Major Accident Hazards (COMAH) Regulations 2015.

## Scope of the Assessment

6.8 As set out in **Chapter 2: Approach to EIA**, the scoping of the EIA and ES has utilised a combination of informal consultation with NPTCBC, culminating in a formal request for an EIA Scoping Opinion in June 2023, supported by an EIA Scoping Report (**Appendix 2.1**). At the point of submission of PAC, an EIA Scoping Opinion from NPTCBC was pending.

6.9 Although the EIA Scoping Report looked to establish the overall framework of the EIA and ES, an iterative scoping process has been adopted in order to respond to the evolving engineering design of the Proposed Scheme. In a similar manner, a number of changes have occurred to the Proposed Scheme since the preparation and submission of the EIA Scoping

Report, as set out within **Chapter 1: Introduction** and **Chapter 2: Approach to EIA**. As a result, it has been necessary to review the scope of assessment proposed.

6.10 As such, this section provides a review, validation and update, where necessary, on the scope of the assessment presented within this Chapter.

**Effects Not Considered to be Significant**

6.11 The following effects were not considered significant as part of the EIA Scoping Report (**Appendix 2.1**) and, taking account of the changes occurring to the Proposed Scheme, are considered to remain unchanged and therefore not considered further in this Chapter (with detailed justification provided within the EIA Scoping Report at Table 6.3 of **Appendix 2.1**):

- Major road traffic accident resulting in death or permanent injury to members of public (construction);
- Major road traffic accident resulting in death or permanent injury to members of public (operation);
- Pollution event / migration of existing contamination from the Site to controlled waterbody (construction);
- Extreme flooding event (including under the influence of climate change) causing risk to human life or failure of operational safety measures, indirectly resulting in other forms of incidents (operation);
- Pollution event occurring during ship transportation of input/output material (operation); and
- Natural disasters events (i.e. hurricanes and earthquakes) impacting users of the site and on-site operations (construction and operation).

6.12 There are no additional effects that have been identified as part of the iterative review process that are now considered unlikely to be significant.

**Effects Considered Likely to be Significant**

6.13 The following effects (**Table 6.1**) which were considered likely to be significant at the EIA Scoping stage, remain unaffected by the changes to the Proposed Scheme since submission of the EIA Scoping Report and therefore these have been assessed and reported within this Chapter:

**Table 6.1: Effects Considered Likely to be Significant**

| Likely Significant Effect | Receptors | Applicable Development Stage |
|---|---|---|
| Operational plant/infrastructure failure (i.e. structure/building collapse, human error, explosion, non-descriptive accident) | Future on-site users and members of public | Operation |
| Fire event occurring during ship transportation of input/output material | Members of public | Operation |

| Likely Significant Effect | Receptors | Applicable Development Stage |
|---|---|---|
| Fire event occurring on-site and impacting operational activities on-site, as well as consequential chain reaction events | Future on-site users and members of public | Operation |

## Assessment Methodology

### Legislative Framework, Policy and Guidance

6.14 The following legislation and policy have informed or are relevant to the assessment of potential effects within this Chapter:

- Health and Safety at Work etc Act 1974[1];
- The Management of Health and Safety at Work Regulations 1999[2];
- EU Regulation 402/2013 on the Common Safety Method on Risk Evaluation and Assessment (as amended)[3];
- The Planning (Hazardous Substances) Regulations 2015[4];
- Control of Major Accident Hazards (COMAH) Regulations 2015[5];
- Seveso III Directive[6];
- Electricity at Work Regulations 1989[7];
- Dangerous Substances and Explosive Atmospheres Regulations 2002[8];
- Control of Substances Hazardous to Health Regulations 2002[9];
- Equipment and Protective Systems for Use in Potentially Explosive Atmospheres Regulations 2016[10]; and
- The Regulatory Reform (Fire Safety) Order 2005, No. 1541.

6.15 The following guidance has informed/are relevant to the assessment of effects within this Chapter:

- Major Accidents and Disasters in EIA: A Primer[11] (the 'IEMA MAD Primer');
- HSE's Guidance on The Control of Major Accident Hazard (COMAH) Regulations 2015[12]; and
- DEFRA's The Green Leaves III Guidelines for Environmental Risk Assessment[13].

### Defining the Study Area

6.16 The study area, as defined through the EIA Scoping Report (**Appendix 2.1**) for the assessment of major accidents and/or disasters is the Site itself and surrounding area to encompass surrounding human receptors (up to 1km), as the Site is where the major accidents and/or

disasters identified in **Table 6.1** could occur, and the immediate surroundings which could be affected.

6.17 The study area also includes the shipping routes of the ships for loading / unloading of materials, up to the point of reaching Swansea Bay.

**Establishing the Baseline**

6.18 The first stage of assessment in the IEMA MAD Primer for the assessment of major accidents and/or disasters is 'setting out the baseline – hazard identification and receptor tagging'. The receptors were identified as part of the EIA Scoping Report (**Appendix 2.1**) and have been set out in **Table 6.1** as experiencing 'risk events'. Determining the sensitivity of receptors is discussed below under '*Determining Sensitivity of Receptor*'.

6.19 **Table 6.2** summarises all studies/analysis/evaluations undertaken to inform the assessment presented within this Chapter.

**Table 6.2: Background Studies / Surveys / Evaluations /Analysis**

| Study / Survey / Analysis / Evaluation | Overview | Date of Completion |
|---|---|---|
| HSE Design Philosophy (Technip Energies) (**Appendix 6.1**) | Defines the design philosophy for health, safety and environment applied to the Proposed Scheme to ensure potential hazards are identified; risks reduced to as low as reasonably practicable, and facilities are developed with inherently safer design and best available techniques.<br>Additional risk assessment/method statements identified within this report will be prepared following finalisation of the engineering design to ensure they are accurate and reflective of on-site plant/equipment. | May 2023 |

**Assessment Process**

6.20 Schedule 4, Paragraphs 5 and 8 of the EIA Regulations set out the requirement to consider the risk of major accidents and/or disasters relevant to the Proposed Scheme. The EIA Regulations are not specific on the nature of risk or disasters to consider, nor on the approach to be adopted when determining whether such effects may be significant or not. The most applicable guidance in relation to major accidents and disasters is the IEMA MAD Primer which provides context to the way in which the technical aspects should be addressed through the EIA process. The IEMA MAD Primer has been used to inform the assessment methodology below.

6.21 A qualitative assessment has been completed to determine the reasonable worst-case impact associated with each risk event that has been identified as having the potential to be

likely and significant (**Table 6.1**). Other factors considered are the understanding of the likelihood of a risk event occurring and the mitigation identified to control risks.

6.22 This is informed by the Applicant's management procedures and how it proposes operational activities will align with key legislation and guidance. The HSE Design Philosophy (**Appendix 6.1**) also includes a focus on mitigation to be adopted to reduce any risk event down to "as low as reasonably practicable" (in line with IEMA MAD Primer).

6.23 It is noted that the presence of TATA steelworks and its associated 'risks' could interact with the risks associated with the Proposed Scheme, or the occurrence of a risk event associated with the Proposed Scheme inducing and/or contributing to the occurrence of a risk off-site at TATA Steelwork. Nonetheless, it is perceived that the management of risks to ALARP for the Proposed Scheme in isolation, that the HSE COMAH consent for TATA Steelworks will also have ensured that risks are controlled to ALARP, and that any consent received for the Proposed Scheme in line with the COMAH Regulations will ensure such aspects are considered and addressed as part of design or implementable control mechanisms, there is confidence that such aspects can be excluded from further assessment.

**Reporting of the Environmental Effects and Significance Criteria**

6.24 The assessment of likely significant environmental effects as a result of the Proposed Scheme has taken into account the construction stage and operational stage. The following sections define the approach adopted within the assessment for the determination of sensitivity of receptors (or value/importance), magnitude of change (or impact), the level of effect and significance.

***Determining Sensitivity of Receptor***

6.25 The sensitivity of affected receptors has been considered on a scale of **high**, **medium**, **low** or **negligible**.

6.26 Sensitivity considers the identified receptors that will be subject to the identified risk event, and adaptability or tolerance of these receptors to change and their ability to recover following the risk event. However, as all of the receptors identified are in relation to population and human health, the sensitivity of all receptors are considered to be high, as there would be no adaptability or tolerance to any major accident and/or disaster because the consequences could be fatal.

***Determining the Magnitude of Change***

6.27 Magnitude of change has been determined by considering the combination of severity of the risk (including taking account of geographical extent and duration) and likelihood, informed by the Applicant's HSE Design Philosophy (**Appendix 6.1**).

6.28 The magnitude of change has been considered as the change experienced from the current baseline conditions at the sensitive receptor and has been considered on a scale of **large**, **medium**, **small** or **negligible**.

6.29 **Table 6.3** sets out the risk criteria, with **Table 6.4** collating this into a risk matrix that includes the levels of magnitude of change.

**Table 6.3: Risk Criteria**

| | Applied Scale | Corresponding Terminology | Description |
|---|---|---|---|
| Severity | 1 | Minor | No perceived harm to human health (including welfare) and limited potential impact to the environment with short-term implications. |
| | 2 | Moderate | Result in limited harm to human health (i.e. with short to medium-term implications on health and welfare) and/or result in negative impacts and damage to the environment with medium-term implications. |
| | 3 | Severe | Result in notable harm to human health (i.e. long-term implications on health and welfare) or result in low to medium-scale fatalities (in terms of numbers of fatalities) and/or total removal or damage to the environment with long-term, wide-reaching but reversible implications. |
| | 4 | Extreme | Result in notable harm to human health (i.e. long-term implications on health and welfare) or result in large-scale fatalities (in terms of numbers of fatalities and geographical scale of event) and/or total removal or damage to the environment with long-term, wide-reaching and non-reversible implications. |
| Likelihood | 1 | Low | Occurrence of risk event is considered highly unlikely (albeit not impossible) or almost entirely limited by the presence of suitable control measures. |
| | 2 | Medium | Potential for risk event to occur but can be partly limited due to presence of suitable control measures. |
| | 3 | High | Elevated potential of risk event to occur and inability to limit likelihood through the use of control measures. |

**Table 6.4: Risk Matrix**

| Severity | Likelihood | | |
|---|---|---|---|
| | 1 – Low | 2 – Medium | 3 – High |
| 1 – Minor | Negligible | Small | Small |
| 2 – Moderate | Small | Small | Medium |
| 3 – Severe | Small | Medium | Large |
| 4 – Extreme | Medium | Large | Large |

***Determining the Level of Effect***

6.30 The level of effect has been informed by the magnitude of change due to the Proposed Scheme and the evaluation of the sensitivity of the affected receptor. The level of effect has been determined using professional judgement and **Table 6.5** has been a tool which has assisted with this process.

6.31 Whilst **Table 6.5** provides ranges, the level of effect is confirmed as a single level and not a range, informed by professional judgement. For each effect, it has been concluded whether the effect is '*beneficial*' or '*adverse*'.

**Table 6.5: Matrix to support determining the level of effect**

| | | Sensitivity (or value / importance) | | | |
|---|---|---|---|---|---|
| | | High | Medium | Low | Negligible |
| Magnitude of Change | Large | Major | Moderate to Major | Minor to Moderate | Negligible |
| | Medium | Moderate to Major | Moderate | Minor | Negligible |
| | Small | Minor to Moderate | Minor | Negligible to Minor | Negligible |
| | Negligible | Negligible | Negligible | Negligible | Negligible |

6.32 The following terms have been used to define the level of the effects identified and these can be 'beneficial' or 'adverse':

- **Major effect**: where the Proposed Scheme is likely to cause a considerable change from the baseline conditions and the receptor has limited adaptability, tolerance or recoverability or is of the highest sensitivity;

- **Moderate effect**: where the Proposed Scheme is likely to cause either a considerable change from the baseline conditions at a receptor which has a degree of adaptability, tolerance or recoverability or a less than considerable change at a receptor that has limited adaptability, tolerance or recoverability;

- **Minor effect**: where the Proposed Scheme is likely to cause a small, but noticeable change from the baseline conditions on a receptor which has limited adaptability, tolerance or recoverability or is of the highest sensitivity; or where the Proposed Scheme is likely to cause a considerable change from the baseline conditions at a receptor which can adapt, is tolerant of the change and / or can recover from the change; and

- **Negligible**: where the Proposed Scheme is unlikely to cause a noticeable change at a receptor, despite its level of sensitivity or there is a considerable change at a receptor which is not considered sensitive to a change.

6.33 The duration of the effect has been assessed as either 'short-term', 'medium-term' or 'long-term'. Short-term is considered to be up to 1 year, medium-term is considered to be between 1 and 10 years and long-term is considered to be greater than 10 years.

***Determining Significance***

6.34 For each effect, a statement has been made as to whether the level of effect is '**Significant**' or '**Not Significant**'. This determination has been based on professional judgement and relevant guidance and legislation where applicable.

6.35 Significance has only been concluded for residual effects (i.e. following the identification and assessment of secondary mitigation).

## Baseline Conditions

6.36 The Site does not currently contain any uses, so there are not considered to be any operational hazards on Site. A review of the Control of Major Accident Hazards (COMAH) 2015 Public Information Records[14] from HSE identified two establishments within 3 miles of the Site that have operations that fall under the COMAH Regulations 2015 and thus could be a potential existing source of a major accident or disaster. The identified establishments are:

- BOC Limited (Margam) – approximately 3.4km south-east of the PDZ; and

- Tata Steel UK Limited (Port Talbot Steelworks) – located adjacent to the Site.

6.37 As noted above, Tata Steel's Port Talbot Steelworks (classified as an upper tier establishment[a]) is located adjacent to the Site and therefore the closest source of potential major accident/disasters. The COMAH records indicate that the principal dangerous substances associated with the establishment include flammable liquids and gases; substances hazardous to the aquatic environment; and toxic substances. BOC Limited (Margam) is also an upper tier establishment.

6.38 A review of the HSE's Planning Advice Web App[15] has also shown that approximately 0.3ha of the eastern-most corner of TCA East on the Site is within the outer zone of a hazard identified by the HSE, which is associated with Tata Steel's Port Talbot Steelworks. Whilst there are risks associated with Port Talbot Steelworks (as set out above), there are

[a] There are two types of establishment which are subject to COMAH – Upper and Lower Tier. Which tier an establishment falls in is dependent on the quantity of dangerous substances they hold. An upper tier establishment has a greater quantity of dangerous substances, as defined by the thresholds in Schedule 1 of The Control of Major Accident Hazards Regulations 2015.

emergency arrangements, response systems and procedures in place to address any accident scenarios and risks at the establishment.

## Future Baseline

6.39 There are not anticipated to be any natural changes to the Site or surrounding area in relation to the major accidents and/or disasters baseline.

6.40 The major accidents and/or disasters baseline is influenced by human-related activities, and therefore, any change to the future baseline would be linked to further development or changes to existing development, technologies and practices in the surrounding area.

## Primary and Tertiary Mitigation

### Operational Stage

6.41 The following primary and tertiary mitigation which has been evaluated as part of the operational stage assessment is outlined below. This list has been informed by the HSE Design Philosophy (**Appendix 6.1**).

6.42 The principle of inherently safer design has been applied by the project engineers throughout the Front End Engineering Design (FEED) stage[b]. This has been informed by both the project specific HSE Design Philosophy (**Appendix 6.1**), as well as the HSE Measures Documents[16], which establish guidance and principles for all facilities/projects that fall within the COMAH Regulations, such as the Proposed Scheme. The FEED stage for the Proposed Scheme has considered the hierarchy of controls in determining feasible and effective control solutions to reduce exposure to occupational hazards for on-site users (and thus limiting implications beyond the Site). The hierarchy of controls from most effective to least effective strategy is:

- Elimination;
- Substitution;
- Engineering controls;
- Administrative controls; and
- PPE.

6.43 The Proposed Scheme has been designed in such a way that its human and machine or equipment interface points are suitable for the task and the inherently safer design principle of simplification has been considered. This has included consideration of accessibility of maintenance equipment, safe isolation of equipment as well as personnel access and egress during maintenance activities. Specific measures include:

- The plant layout of the Proposed Scheme, as identified in **Figure 4.8,** has been designed with an emphasis on inherently safer design and reducing identified risks to As Low As Reasonably Practicable (ALARP) (i.e. implementation of elimination and

[b] The FEED stage is an engineering design stage used to defined and plan a project in advance of requesting fix bids quotes for the construction of the project.

substitution of the hierarchy of controls). The principles that have been considered and implemented when designing the layout of the facility includes (but are not limited to):

- Separation of high-risk equipment items to control the loss of containment hazards and minimize escalation;
- Separation of plant and buildings by distance to control or minimise effects of hazards;
- Provision of an open arrangement of plant to minimise potential for gas or vapour leak accumulation;
- Minimisation of hazardous inventories by reducing pipe runs;
- Accessibility for normal and emergency operations;
- Safety requirements for personnel and vehicular traffic, security and access for maintenance and operation;
- Adequate and safe access for emergency evacuation and firefighting;
- Adequate separation between flammable hydrocarbons and potential ignition sources;
- Limit or prevent escalation of a fire through the incorporation of spacing that adequately separates the process unit(s), large structures and process drainage systems;
- Contain and prevent the spread of fire by having early detection and warning devices and systems that enable emergency isolation, shut down of process equipment to limit the volume of material released in the event of fire;
- Protect steel structures by providing passive and active fire protection systems in hazardous areas;
- Adequate separation between hydrocarbon handling areas and emergency services, life-safety equipment, escape routes and muster points;
- Incorporation of emergency muster points within the overall design and layout;
- Avoid loss of life and serious injuries by providing adequate means of escape for personnel to evacuate safely provided from all plant areas, regardless of frequency of occupation. Escape routes will be readily accessible, unobstructed, clearly marked and take the most direct route away from a hazardous area to safety,[c].There will be a minimum of two escape routes from all commonly used areas on the plan (excluding infrequently accessed elevated platforms or modules); Furthermore, there will be provision of access for emergency

[c] During operation of the Proposed Scheme the Applicant will ensure an Escape, Evaluation and Rescue Analysis study is in place (which is considered as part of the FEED stage) and appropriate training of staff to ensure implementation of measures.

responders to a fire and safe access for personnel to isolate plant and equipment as required;

- Emergency services such as fire and ambulance services are to have a clear approach to the facility;
- Operational shelters have been located in a non-hazardous area;
- Electrical facilities have been located so that they are largely unaffected by incident heat radiation or explosion overpressures resulting from credible accidents;
- The design of facilities has ensured structural integrity can be maintained during a hazard condition to avoid escalation, and provide sufficient time to enable orderly evacuation to be achieved;
- Design of the plant has ensured that the detrimental effects of natural forces (for example extreme weather events) are minimal;
- Provision of suitable and sufficient drainage and spill control;
- Orientation of plant to account for the prevailing wind directions so that any accidentally released flammable and/or toxic gases are away from potential sources of ignition, safe areas or inhabited properties outside the boundary fence;
- Containment of large quantities of flammable fluids has been located such that prevailing winds will direct any vapour from an accidental spill away from the units and plant;
- Vents and flares have been located to reduce minimum interference or hazard to personnel, plant and general public;
- The safety requirements for hazardous area classification and the selection of electrical equipment have been duly implemented consistent with requirements of the Dangerous Substances and Explosive Atmospheres Regulations 2002[17]. Where buildings such as sub-stations and control buildings are proposed, they have been located as far as practicable in areas that are classified as non-hazardous. In any event, HVAC intake for such buildings will be located in non-hazardous area and away from possible hydrocarbon leak sources.

- Materials of construction will be selected to be appropriate for the process conditions in order to control the effects of temperature, corrosion, embrittlement and hence, avoid loss of containment. Gaskets selected will be consistent with EN 13555 standard described in BATs with bleeds and vents to atmosphere provided with position isolation (cap, plug or blind flange).

- Safety signs shall be provided throughout the plant to provide warning or information, or to identify locations of safety, firefighting and survival equipment. Safety signage will identify where additional PPE is required while safety and environmental critical equipment tags will be differentiated from other equipment tags.

- Safety showers and eye wash units will be located at strategic locations of the process or utility plot where hazardous substances are stored or used (including throughout the PDZ and at marine unloading/loading facilities). Lighting, including emergency lighting, shall be provided at the safety shower locations.

- Self-contained breathing apparatus (SCBA) will be provided in building and designated plant areas, and they shall be housed in protective containers. The containers will be suitably painted and provided with signs to advise personnel of their contents. The SCBA sets will be regularly checked and maintained and facilities will be available on site, or at a local depot, to recharge the air bottles at short notice. The quantity of breathing apparatus to be provided for the Proposed Scheme will be greater than the expected number of the firefighting and emergency response team and personnel working in the process area of the plant when fully manned.

- Windsocks shall be located at strategic elevated locations around the process plant, with at least one windsock visible from any location within the plant area. The windsocks shall be provided with adequate nearby light to ensure visibility at night times.

- Stairs and ladders shall be provided at specified intervals within the facility. Secondary alternative means of escape will be provided from the top of platforms in open-frame structures such as open modules containing process plants.

- Platforms, walkways, ramps and floors with open sides above grade will be provided with guard railings.

- Emergency lighting units with integral battery back-up are to be provided for the light fittings inside buildings, modules and plant structures to light up escape routes such as stairways.

- All exposed moving parts on all machinery shall be suitably guarded to protect personnel from injury. Guards and safety devices provided shall be well maintained and kept in position whilst machinery is running.

6.44 Quantified risk assessments will be undertaken to identify the main contributors to the Proposed Scheme's risk profile and include a breakdown of risk by hazard category, leak sizes and release source. The quantitative risk assessments will be required to support a COMAH Safety Report which needs to be submitted to the HSE for Upper-Tier Sites. The Safety Report is required to be submitted before both the start of construction and the start of operation. Therefore, it is expected that the quantified risk assessments will be available as part of the pre-construction safety report but may be updated as part of the pre-operation safety report. This will provide the basis for identifying potential preventative and remedial actions, including those set out above.

6.45 All foundations across the Site will be designed and installed in line with relevant standards and guidance, including (but not limited to) CIRIA Report C572: Treated ground engineering properties and performance; British Research Establishment document FB75: Building on Fill – Geotechnical Aspects and BS 6031:2009: Code of Practice for Earthworks.

6.46 Given the nature of the Proposed Scheme, the Applicant will require relevant approvals from the Health and Safety Executive (HSE) in line with the Control of Major Accident Hazards

(COMAH) Regulations, which is in place to ensure that all operations with dangerous substance (such as the Proposed Scheme) take all necessary measures to prevent major accidents involving dangerous substances and limit the consequences to people and the environment of any major accidents which occur. Through this approval process the Applicant will demonstrate all aspects of their quantified risk assessment and controls, which will be subject to review and validation by the HSE.

6.47 All aspects above will be provided and secured through the COMAH Safety Report, which will be submitted to the HSE, and is required before the start of construction and operation.

## Assessment of Effects, Secondary Mitigation and Residual Effects

### Operational Stage

***Operational plant/infrastructure failure (i.e. structure/building collapse, human error, explosion, non-descriptive accident)***

6.48 As set out through **Chapter 4: Development Specification** and **Figure 4.8**, the Proposed Scheme includes a large number of plant and equipment fundamental to its overall process and operation. The fundamental route of potential risks of 'failure' of operational plant and equipment is largely linked to the overall design process (i.e., selection of equipment and its layout and interface with each other), which includes the way in which appropriate control measures are implemented (i.e. equipment isolation functions or incorporation of sensors/monitors to identify failures or issues).

6.49 As set out under '*Primary and Tertiary Mitigation*' section above, through the FEED design process all potential risks inherent to the design and layout of the Proposed Scheme have been considered and either resolved or managed so as to achieve a risk level ALARP. This has been cognisant to all inputs and outputs of the chemical processes of the plant in operation, and the primary process, as well as all ancillary infrastructure needs (i.e., utilities).

6.50 Such an approach aligns with the elimination and substitution principles of the prevention hierarchy implemented for the Proposed Scheme. In addition to these specific aspects, the structural stability of plant and equipment will be responsive to the site-specific ground conditions, comprised of piled foundations (as per **Chapter 4: Development Specification**). All foundations will be designed and constructed in line with best practice guidance and measures, including the HSE Measures Documents (See *'Primary and Territory Mitigation'*).

6.51 In addition to the overall design and specification of plant and equipment, the presence of 'controls' that allow for automatic or manual intervention in the case of potential major accidents/ disasters, in line with the engineering controls principle from the prevention hierarchy, are inherent in the design and the adequacy of such interventions will be fundamental to the Applicant and Proposed Scheme receiving consent and approval from the HSE. Such measures will limit instances of risk arising from human error, non-descriptive accidents or the general failure of plant and equipment resulting in a major accident or disaster.

6.52 Overall, the Proposed Scheme has been designed to remove or control risks to ALARP, albeit risks will inherently remain present and with potential high severity. It is considered that risks severity scale would up to 3 – Severe (in line with **Table 6.3**). The risk likelihood category would be 1 – Low (in line with **Table 6.3**). As such there would be an overall

magnitude of change of small (in line with **Table 6.4**). Given the high sensitivity of the future on-site users and members of public, it is considered that there would be a direct, permanent, long-term, adverse effect which is considered to be minor at worst.

*Secondary Mitigation or Enhancement*

6.53 No secondary mitigation or enhancement is required or has been identified as the risk is considered to be controlled to ALARP through the primary and tertiary mitigation measures. As outlined under '*Primary and Tertiary Mitigation*' above, these aspects will be provided and secured through the COMAH Safety Report, which will be submitted to the HSE, and is required before the start of construction and operation.

*Residual Effect*

6.54 In the absence of secondary mitigation, the residual effect for future on-site users and members of public is the same as that reported in the pre-mitigation scenario.

*Significance*

6.55 This effect is considered to be **Not Significant**.

***Fire event occurring during ship transportation of input/output material***

6.56 As defined within **Chapter 4: Development Specification**, the Proposed Scheme will utilise the marine unloading/loading facility to import ethanol feedstock and export SAF and RD produced on-site, using ship tankers. As defined within the EIA Scoping Report (**Appendix 2.1**) this the risk of fire event occurring during ship transportation is applicable within Port Talbot Docks or at sea and when the proposed ship(s) are in transit, rather than whilst unloading/loading, which is considered separately under *Fire event occurring on-site and impacting operational activities on-site, as well as consequential chain reaction events* , where the marine unloading/loading facility has been treated as part of the equipment / plant of the Proposed Scheme.

6.57 Therefore, the risk associated with this is in relation to the suitability of the ship for transport of such materials and its specific management practices on-board whilst in transit. The Applicant does not operate the proposed shipping, instead these would be undertaken by appropriate third parties, either procured by the Applicant (in terms of SAF export) or by the ethanol feedstock supplier. Therefore, there are limited measures implementable by the Applicant as part of the Proposed Scheme to control potential risk and of fire event during ship transportation. As noted within the EIA Scoping Report (**Appendix 2.1**), the transportation of flammable materials (i.e. such as the ethanol and SAF) is controlled and regulated by the UN Model Regulations[18], The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009[19], The International Convention for the Safety of Life at Sea, 1974 (SOLAS)[20], The International Carriage of Dangerous Goods by Inland Navigation (ADN)[21], amongst other legislation and regulation. All such legislation and regulation places responsibility on the relevant transporters of flammable materials. Adherence to measures and standards set out within the identified legislation and regulations are considered to limit the risks to ALARP.

6.58 It is considered that risks severity scale would up to 3 – Severe (in line with **Table 6.3**) when located within Port Talbot Dock but would reduce to 1 – Minor once at sea, as the receptors (members of the public) would no longer be present. The risk likelihood category is perceived to be 1 – Low (in line with **Table 6.3**) given the abundance of relevant legislation and regulations. As such, there would be an overall magnitude of change of negligible up to small

(in line with **Table 6.4**). Given the high sensitivity of the members of public, it is considered that there direct, permanent, long-term, adverse effect which is considered to be negligible up to minor at worst.

*Secondary Mitigation or Enhancement*

6.59 No secondary mitigation or enhancement is required or has been identified as the risk is considered to be controlled to ALARP through the primary and tertiary mitigation measures. As outlined under '*Primary and Tertiary Mitigation*' above, these aspects will be provided and secured through the COMAH Safety Report, which will be submitted to the HSE, and is required before the start of construction and operation.

*Residual Effect*

6.60 In the absence of secondary mitigation, the residual effect for future on-site users and members of public is the same as that reported in the pre-mitigation scenario.

*Significance*

6.61 This effect is considered to be **Not Significant**.

***Fire event occurring on-site and impacting operational activities on-site, as well as consequential chain reaction events***

6.62 As outlined above, and in **Chapter 4: Development Specification**, the Proposed Scheme includes a number of flammable materials, either as inputs or outputs of the process (including being stored on Site), as well as intermediate materials present within the overall process. Therefore, there is the risk that these flammable materials could be ignited and result in a fire event if not properly managed, which could impact operational activities and have consequential chain reaction events (e.g. explosion or failure of equipment).

6.63 Similar to the assessment of *Operational plant/infrastructure failure* section above, and as identified within the '*Primary and Tertiary mitigation*' section, the Proposed Scheme has been designed in such a way that necessary control measures to avoid fire, both in terms of fire generation and prolonged fire events, have been designed into the Proposed Scheme. This design includes spacing of plant to contain fires, automatic and manual controls to isolate or close down plant and equipment where necessary, as well as ensuring potential ignition sources are removed from areas of flammable materials. Furthermore, these measures will be supplemented by the operational management practices specific to fire events as set out within *'Primary and Tertiary Mitigation'*. Relevant operational management practices include (but not limited to) clearly identified muster points; self-contained breathing apparatus being provided; and safety signs to identify locations of safety, firefighting and survival equipment. All such measures are informed by the overarching best practice and guidance for such projects as the Proposed Scheme, specifically (but not exclusively) the HSE COMAH Regulations and associated HSE Measure Documents.

6.64 Overall, the Proposed Scheme has been designed to remove or control risks to ALARP, albeit risks will inherently remain present and with potential high severity. It is considered that risks severity scale would up to 3 – Severe (in line with **Table 6.3**). The risk likelihood category would be 1 – Low (in line with **Table 6.3**). As such there would be an overall magnitude of change of small (in line with **Table 6.4**). Given the high sensitivity of the future on-site users and members of public, it is considered that there would be a direct, permanent, long-term, adverse effect which is considered to be minor.

*Secondary Mitigation or Enhancement*

6.65 No secondary mitigation or enhancement is required or has been identified as the risk is considered to be controlled to ALARP through the primary and tertiary mitigation measures. As outlined under '*Primary and Tertiary Mitigation*' above, these aspects will be provided and secured through the COMAH Safety Report, which will be submitted to the HSE, and is required before the start of construction and operation.

*Residual Effect*

6.66 In the absence of secondary mitigation, the residual effect for future on-site users and members of public is that same as that reported in the pre-mitigation scenario.

*Significance*

6.67 This effect is considered to be **Not Significant**.

## Limitations and Assumptions

6.68 To ensure transparency within the EIA process, the following limitations and assumptions have been identified.

- A qualitative evaluation has been sufficient to determine likely significant effects and has been informed by the Applicant's HSE Design Philosophy and associated risk evaluation works being undertaken by the Applicant as part of the design of the Proposed Scheme; and

- It is not necessary for the EIA to set out all procedures and management practices to be implemented in order to manage or reduce risk associated with operational activities, rather this Chapter has set out the relevant legislation, regulation, consent or licence mechanisms that are to be met to resolve potential risks.

## Summary

6.69 **Table 6.6** provides a summary of the effects, receptors, residual effects and conclusions of significance considered within the Chapter.

6.70 The table only provides a summary of the residual effects identified within the assessment and details of all primary, secondary and tertiary mitigation that has been taken into account is set out in detail within the Chapter and summarised within the Environmental Management Plan included within **Volume 3: Environmental Management Plan**.

**Table 6.6: Summary of Residual and Significant Effects**

| Effect | Receptor | Residual Effect | Is the Effect Significant? |
|---|---|---|---|
| **Operational Stage** | | | |
| Operational plant/infrastructure failure (i.e. structure/building collapse, human | Future on-site users and members of public | Minor adverse | NO |

| Effect | Receptor | Residual Effect | Is the Effect Significant? |
|---|---|---|---|
| error, explosion, non-descriptive accident) | | | |
| Fire event occurring during ship transportation of input/output material | Members of public | Negligible up to Minor adverse | NO |
| Fire event occurring on-site and impacting operational activities on-site, as well as consequential chain reaction events | Future on-site users and members of public | Minor adverse | NO |

## References

[1] Health and Safety at Work etc Act 1974, c. 37.
[2] The Management of Health and Safety at Work Regulations 1999, No. 3242.
[3] Commission Implementing Regulation (EU) No 402/2013 of 30 April 2013 on the common safety method for risk evaluation and assessment and repealing Regulation (EC) No 352/2009 Text with EEA relevance.
[4] The Planning (Hazardous Substances) Regulations 2015, No. 627.
[5] Control of Major Accident Hazards (COMAH) Regulations 2015, No. 483.
[6] Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC Text with EA relevance.
[7] Electricity at Work Regulations 1989, No. 635.
[8] Dangerous Substances and Explosive Atmospheres Regulations 2002, No. 2776.
[9] Control of Substances Hazardous to Health Regulations 2002, No. 2677.
[10] GOV.UK (2016). The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016. Available at: The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016 (legislation.gov.uk)
[11] IEMA (2020). Major Accidents and Disasters in EIA: A Primer.
[12] HSE. Control Of Major Accident Hazards Regulations 2015 (COMAH). Available at: Control Of Major Accident Hazards Regulations 2015 (COMAH) (hse.gov.uk)
[13] Cranfield University and Defra (2011). Guidelines for Environmental Risk Assessment and Management – Green Leaves III.
[14] HSE (2015) COMAH 2015 Public Information. Available at: COMAH 2015: Results (hse.gov.uk) [Accessed: 30/06/2023].
[15] HSE's Planning Advice Web App. Available at: HSE's Planning Advice Web App - Login (hsl.gov.uk) [Accessed: 30/06/2023].
[16] https://www.hse.gov.uk/comah/sragtech/techmeasindex.htm
[17] Dangerous Substances and Explosive Atmospheres Regulations 2002. Available at: https://www.legislation.gov.uk/uksi/2002/2776/contents
[18] https://unece.org/transport/dangerous-goods/un-model-regulations-rev-22

[19] https://www.legislation.gov.uk/uksi/2009/1348/contents/made
[20] International Convention for the Safety of Life at Sea (SOLAS), 1974 (imo.org)
[21] The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (legislation.gov.uk)