

Evaluation Criteria

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States of Guernsey

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Acronyms and Abbreviations

CSF	Critical Success Factor
GHSP	Guernsey Hydrocarbon Supply Programme
KPI	Key Performance Indicator
SoG	States of Guernsey
SOP	Hydrocarbon Supply Strategic Outline Programme Version 2.1, 7 April 2014
SRO	Senior Responsible Officer

Purpose

This document sets out the method that will be followed and criteria that will be used to evaluate each element of the States of Guernsey (SoG) hydrocarbon supply chain. It will be used to assess the suitability of both the current arrangements and further options developed as part of this project.

A separate document, the Statement of Requirements (684723-CH2-SOC-00-RP-0003) evaluates the existing hydrocarbon supply chain for Guernsey using the methodology and the evaluation criteria described in this document. It establishes the gap between the risk scores in the existing supply chain and the desired risk scores which will provide the required level of security of supply to Guernsey.

1.1 Background

The stated purpose of the Guernsey Hydrocarbon Supply Programme (GHSP) is to provide a safe and secure hydrocarbon supply delivering socio-economic value to Guernsey. Community and economic life on Guernsey is dependent on the timely delivery of hydrocarbon fuels (petrol, diesel, kerosene, aviation fuel, heavy oil and gas) for transport, heating and electricity. The SoG has stated (in the Hydrocarbon Supply Strategic Outline Programme (SOP)) that “For a host of reasons this [current supply chain] arrangement is not sustainable. It creates significant vulnerabilities in the short-and medium-term whereby a single event could result in the supply mechanism being severely disrupted.”

The first phase of this programme is to develop a list of options covering a range of delivery methods and total storage capacity and then to identify a preferred option for the future supply of hydrocarbons to the Island.

It should be noted that this programme will consider options that fit within the general constraints of current policy. However, it is recognized that future policy may change and therefore the robustness of an option may be evaluated for potential credible changes to policy where relevant.

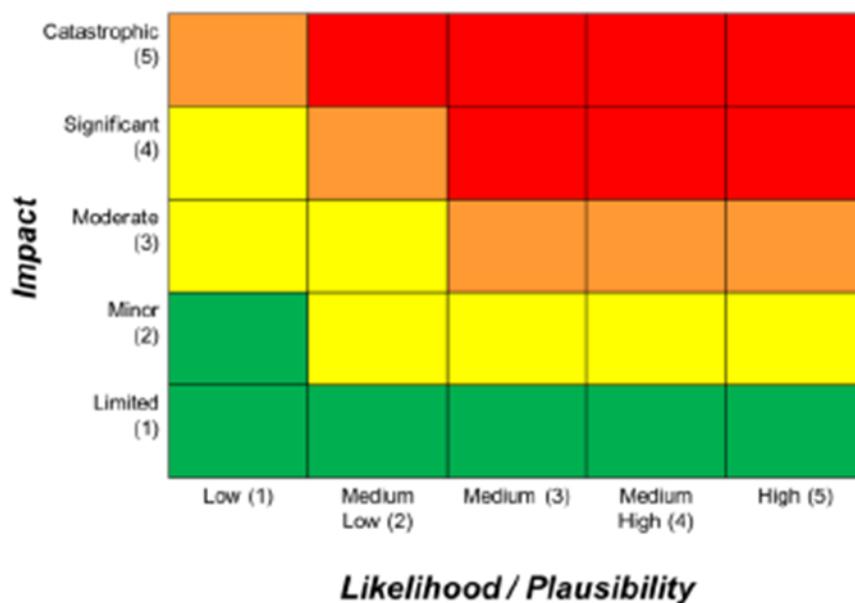
1.2 General Approach

In order to arrive at a preferred solution for future hydrocarbon supply to the Island a risk based approach will be used to characterise risks in each element of the supply chain. The supply chain will be considered in the following elements:

- Refineries/Terminals – source of products
- Transportation – ships, pipelines, tankers
- Upload Facilities – ports, jetties, buoys
- Storage Facilities – storage tanks
- Distribution – on island road tankers/forecourts/pipelines

Risk assessment is a process of understanding the significance of potential events on the basis of their likelihood, and their impact. In the process both likelihood and impact are scored, typically on a five point scale. Risks are plotted against both of these scales on a risk matrix to facilitate an easy relative comparison between them. The scales use broad categories to avoid a false sense of accuracy and to reflect uncertainties. The relative positioning of risks on this matrix can then be used to prioritise risks into very high (red), high (orange), medium (yellow) and low (green) risks (see Figure 1).

Figure 1 Risk Matrix (Source: States of Guernsey)



Once risks in the existing supply chain have been identified and their significance evaluated, a suitable treatment can be proposed to reduce or mitigate the risk. The treatment of each risk may require different approaches including, for example:

- Development of new infrastructure to avoid or reduce the risk
- Transferring the risk to other parties who are better suited to handling the risk
- Altering procurement procedures within the current supply chain to avoid or reduce the risk
- Putting plans in place to manage the consequences of the risk

The approach adopted to identifying, assessing and treating the risks is consistent with the guidelines set out by EURACOM 2011 (European risk assessment and contingency planning methodologies for interconnected energy networks), as well the States of Guernsey risk management procedures, which themselves are based on 2017 UK Government guidance on national risk assessment methodologies¹.

¹ Reference to be provided by N Silk once document is formally published

Establishing the context

2.1 Aims & objectives of the evaluation

As discussed in Section 1.1, the States of Guernsey have previously identified that there is a substantial risk to the safe and secure supply of hydrocarbons to the Island and have commissioned this programme in order to address these concerns and put in place measures to provide a secure future.

The stated aims and objectives of the programme identified by the States of Guernsey in the SOP are reproduced below². The evaluation criteria and the final evaluation of options will ultimately be judged against these Critical Success Factors (CSF).

Table 1 Critical Success Factors (Source: States of Guernsey)

Investment Objective	Critical Success Factor Measure	Measure
Security of supply	On-Island fuel storage maintained above defined strategic levels in line with the security of supply strategy to mitigate against disruption in event of delays in delivery	98% of the time
Reliability of supply	Fuel available when required and without rationing	Always
Value for money	Optimal (economic and strategic) solution implemented to secure supplies	Achieved at a whole-life cost equal or less than comparable facilities in other jurisdictions. All elements are competitively tendered.
Minimizing safety risks to the Island	Reduce number of households and businesses within Development Protection Zone (DPZ) around the fuel storage tanks Reduce number of households and businesses within unloading berth blast zones	80% reduction

2.2 Scope of the evaluation

The primary scope of the evaluation phase is to investigate risks (both short and long term) to the hydrocarbon supply chain for Guernsey. This will extend from the supply at the refineries to the distribution of the hydrocarbons on island to the end users. The following definitions are given to describe the physical limits for each element of the supply chain:

- Refining - from the refinery to the point at which the product leaves the refinery property limit (e.g. port limit in the case of shipping, road network in the case of road transport etc).
- Transport – from port limit to port limit in the case of shipping or landfall points at either end of a pipeline.
- Uploading – from port limit (or landfall point in the case of a pipeline) until the product enters the tanks
- Storage – storage facilities

² The SOP included a fifth CSF which was removed on the recommendation of the Senior Responsible Officer (SRO) in agreement with the Programme Board, as it required a specific solution to be implemented, rather than allowing for a range of potential solutions.

- Distribution – from the storage facilities to the end user (i.e. power station, petrol stations, airport etc)

Risk Assessment

In any risk assessment the following key steps must be followed:

- Risk identification – identify specific risk scenarios which may impact on the hydrocarbon supply chain
- Risk analysis – assess the likelihood and consequences of each risk
- Risk evaluation – evaluate which risks present unacceptable hazards to the Island

The following sections describe these steps in more detail.

3.1.1 Risk Identification

The first step in the process is the selection of risks for consideration. Risks are identified in consultation with stakeholders and experience from the broader oil and gas industry.

This risk assessment is designed to be a strategic risk assessment tool to support options appraisal and is therefore pragmatically selective. It is not designed to capture every risk that Guernsey could face regarding hydrocarbons, but instead focuses on scenarios that are representative of the wider risk landscape and which inform our understanding of the common consequences Guernsey could face.

Risk descriptions have to strike a balance between being sufficiently generic to encourage consideration of a range of possibilities but specific enough to be meaningful for planning and options appraisal purposes.

3.1.1.1 Specifying risk scenarios

For the purposes of informing the evaluation, it is essential that risks are clearly defined and that sufficient detail is provided on the primary risk outcomes. To ensure risks are broadly comparable the risk assessment uses a Reasonable Worst Case Scenario (RWCS) for each risk. The RWCS is defined as a challenging yet plausible manifestation of the risk. The use of RWCS ensures that the risk assessment does not compare the best case for some risks and the worst case for others. Research and analysis that goes into determining the RWCS can also be used to inform risk ranges³.

The primary outcomes of the RWCS is described in the “outcome description” for each risk. The outcome description specifies the event to an extent that makes it possible to assess the impact and likelihood. This includes specific assumptions that have been made for the purpose of outlining the RWCS such as the location or other factors that might specifically influence the impact or likelihood of the event.

For each of the individual components of the supply chain a number of key risk scenarios will be defined. These scenarios will be identified based on our assessment of the supply chain, feedback from stakeholders and their perception of key risks as well as industry standard risks.

Once the individual risk scenarios have been identified they will then be categorized in line with the guidelines provided by the States of Guernsey. These are defined in Figure 2 below.

³ See Section 3.1.2

Figure 2 Risk Categories (Source: States of Guernsey)

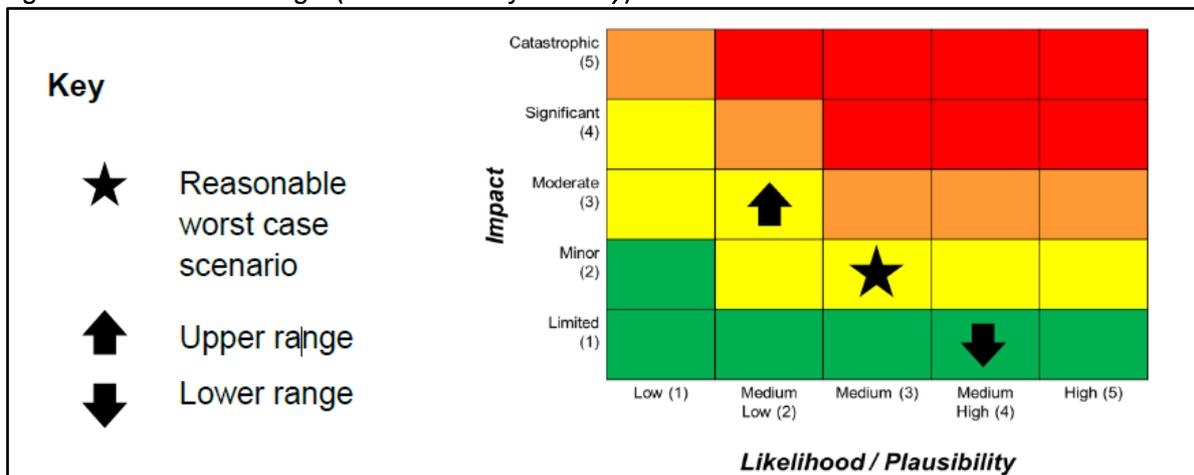


3.1.2 Risk Analysis

Each risk will include a RWCS, a lower range and an upper range. The lower and upper ranges demonstrate alternative manifestations of that risk scenario which have been considered in the process of identifying a RWCS. Including ranges with greater and lesser impacts / recurrence rates provides greater transparency with regards to planning and places greater emphasis on agility and scalability when assessing potential treatments/options to mitigate the risk.

The matrix below (Figure 3) illustrates the use of ranges, with the RWCS in the centre, the “upper range” being a more impactful but less likely scenario and the “lower range” being a less impactful but more likely one. In addition to containing information specific to the RWCS, full risk scenarios also contain a brief paragraph explaining these alternative scenarios.

Figure 3 RWCS and risk ranges (Source: States of Guernsey)



3.1.2.1 Linked and Compound Risks

The risk assessment is based on single events and does not assign scores to scenarios involving many different risks occurring at once. However, each risk will include information on linked and compound risks in order to further inform planning/decision making.

a) Linked risks - Linked risks are those where the occurrence of one risk makes another more likely, or where both risks share a cause.

b) Compounding risks - Compound risks are those where the occurrence of one risk makes another significantly more impactful. For example, severe cold and snow would increase the impact of fuel shortage risks.

3.1.2.2 Likelihood assessment

The likelihood is expressed on a 1-5 scale. For clarity, the scale is defined explicitly in terms of probabilities but the extent to which it is actually possible to apply these probabilities in the likelihood assessments will vary considerably. Depending on data availability.

Table 2 Likelihood Definition (Source: *States of Guernsey*)

Score	Descriptor	Interpretation	Percentage chance over 5 years	Chance over 5 years
1	Low	It is extremely unlikely that the event will occur as there is nearly no experience of it in the sector.	Between a 0.005% and 0.05% chance	Between a 1 in 20,000 and 1 in 2,000 chance
2	Medium-low	The event is unlikely to occur as experience of it is very limited in the sector.	Between a 0.05% and 0.5% chance	Between a 1 in 2,000 and 1 in 200 chance
3	Medium	It is likely that the event will occur as similar events have been reported in the sector.	Between a 0.5% and 5% chance	Between a 1 in 200 and 1 in 20 chance
4	Medium-high	It is very likely that the event will occur in the supply chain as most of the sector has already suffered such events.	Between a 5% and 50% chance	Between a 1 in 20 and a 1 in 2 chance
5	High	The event will happen in the supply chain in the close future.	More than a 50% chance	More than a 1 in 2 chance

The design of the above likelihood scale is influenced by two factors. Firstly, the events covered by this risk assessment will tend to be very unlikely. Experience has shown that a typical likelihood scale that ranges linearly from 'highly likely' to 'highly unlikely' would cause the great majority of risks to cluster at the lower end of the scale. Since the primary purpose of the likelihood assessment (and the risk assessment as a whole) is to differentiate the seriousness of possible events, this would be unhelpful. Consequently, the likelihood scale increases exponentially by an order of magnitude per step on the scale (i.e. it is logarithmic). The result is a better spread of likelihoods for the events being assessed.

The second factor that influenced the design of the scale is the precision with which the likelihood assessments can be made. In some cases there will be statistical data that lends a high degree of confidence to the assessment (e.g. based on historical assessment, modelling, robust analytics, etc.).

In many cases though, it is only possible to differentiate likelihoods by orders of magnitude. The points on the likelihood scale above represent this.

3.1.2.3 Impact Assessment

Impact assessments are based on both quantitative evidence and qualitative judgement. The impact assessment covers five dimensions, each measured on a scale of 0-5. The five dimensions consist of:

a) **Financial Impact:** this is a measure of the total financial cost derived as a result of each risk occurring, including costs incurred up to five years post-incident. This includes assessment of human costs, lost working hours, lost assets, decontamination costs, fines or compensation and the costs of alternative arrangements.

b) **Reputation Impact:** the damage to Guernsey's reputation as a result of the defined risk event is measured in the extent of media coverage. The inefficiency that a foreseeable event is dealt with will impact on Guernsey's reputation globally and business may choose other locations over Guernsey or relocate.

c) **Continuity of Service Impact:** is an estimate of the number of days of the Island's required fuel supply remaining in the storage tanks. Some risk events will lead to low levels of hydrocarbons in on island storage through supply delays or a catastrophic loss of hydrocarbons.

d) **Health and Safety Impact:** the level of harm as an immediate result of the risk event occurring. Knock on effects such as the hospital having no power resulting in fatalities is not covered in this assumption and dealt with as part of a planning assumption in the Bailiwick Risk Register.

e) **Regulatory Impact:** where specific regulation exists regarding the risk event the level of breach is estimated.

The scoring scales (0-5) are designed to identify order of magnitude differences with the scale, duration and severity of incidents increasing as the scale increases. So the scoring scale runs from No Impact (0) to Catastrophic (5) with impact definitions for each of the five dimensions, as illustrated in Table 3.

Table 3 Impact Definition (Source: States of Guernsey)

Impact Score	Financial (loss of revenue, customer compensation during the period of the incident for any part or element of the supply chain)	Reputation	Continuity of Service	Health & Safety	Regulatory
5 Catastrophic	Greater than £5million	Sustained national adverse media attention	Fuel rationing for more than 1 week	Multiple fatalities from a single occurrence	Breakdown in relationship with International Regulator
4 Major	£1million to £5million	One off national adverse media attention	Fuel rationing for up to 1 week	A fatality or serious disability or life threatening health effect	Breach of regulation or legislation with severe costs / fine
3 Moderate	£100,000 to £1million	Sustained adverse local media and / or social media attention	<5 days strategic volumes remaining in the tank and fuel rationing being considered	A lost time injury (>3 days) or serious injury (reportable) or irreversible health effect	Breach of legislation or code resulting in fine or rebuke by Court or Regulator
2 Minor	£5,000 to £100,000	One off adverse local media and / or social media attention	5 to 10 days strategic volumes remaining in the tank	A minor injury (medical treatment <3 days lost time) or reversible health effect or restriction to Work Activity	Breach of legislation or code resulting in a compensation award
1 Insignificant	Less than £5,000	Internal Matter	10 to 20 days strategic volumes remaining in the tank	A slight injury (first aid) or slight health effect	Breach of legislation or code resulting in no compensation or loss
0 No impact	No financial loss	No reputational damage	>20 days strategic volumes remaining in the tank	No injury or health effect	No regulatory or code breach

An 'Overall Impact Score' is the collective result of the five dimensions listed above and thus measures the degree to which the impacts of a scenario cross-cut all five. This is calculated using the highest score of the five dimensions given above.

3.1.2.4 Expressing overall confidence in a risk

The risk assessors provide a summary statement of the confidence they have in the assessment of each risk. Within this methodology a "very high confidence" assessment would indicate that the

assessment is based on a thorough knowledge of the issue, a very large quantity and quality of underpinning evidence and high level of agreement amongst the expert community. A four-point confidence scale is used to grade each assessment going from Very High to Very Low.

Very High confidence in the overall assessment based on a thorough knowledge of the issue and includes evidence of a very high quality informed by consistent relevant expert judgments.

High confidence in the overall assessment based on a large body of knowledge of the issue and includes evidence of a high quality informed by consistent relevant expert judgments.

Low confidence in the overall assessment based on a relatively small body of knowledge of the issue and includes relevant evidence and somewhat consistent relevant expert judgments.

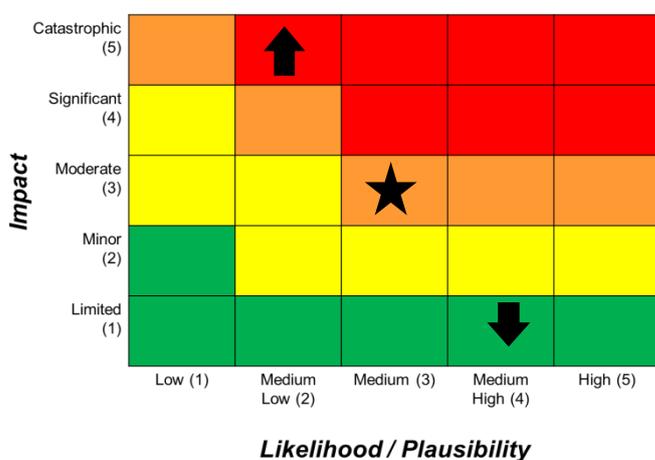
Very Low confidence in the overall assessment based on small to insignificant body of knowledge of the issue and includes evidence of low quality and inconsistent relevant expert judgments.

3.1.3 Risk Evaluation

Having assessed the risks according to the methodology set out in the previous section, the risks can be ranked for evaluation. The following method will be employed to determine which risks require mitigation:

- Risks where the RWCS is “red” require treatment.
- Risks where the RWCS is “orange” but the Upper Range is “red” require treatment.
- All risks with RWCS of “orange” should consider planning strategies to limit the impact of the risk if removing the cause of the risk is not viable.

Figure 4 Example of Risk that requires treatment



Key

- ★ Reasonable worst case scenario (RWCS)
- ↑ Upper range ↓ Lower range

3.1.3.1 Risk Treatment

For all of the risks where the control adjusted risk score is above the minimum requirements set out in the section above, various treatment options can be proposed such as:

- Treat by reducing the likelihood of the risk occurring;
- Treat by reducing the consequence of the risk occurring;

- Transfer / share the risk to another party (e.g. contracts, insurance, outsourcing, joint ventures etc);

With the objective of reducing risk scores to the desired levels i.e.:

- RWCS and Upper Range orange or below
- Upper Range orange or below, if RWCS is orange
- Planning strategies to limit impact if RWCS is orange

Selection of the preferred option

Once the treatments for each of the key risks in the existing supply chain have been established a number of full supply chain options can be proposed which either eliminate or reduce to acceptable levels, the key risks identified during the risk assessment. It is recognized that some of these options may require a phased approach to their implementation (e.g. short term acceptance of higher risks in order to achieve the long term goal).

Once a short-list of full supply chain options has been developed they will be evaluated against each other to determine the preferred option. The following will be considered in the evaluation:

- What are the costs to implement the option and run it over the lifetime of the scheme (e.g. 25 years) based on a net present value (NPV) evaluation method?
- Are there any additional benefits that the option may have outside the hydrocarbons programme?
- Does the option negatively impact on any other activities or policies of the States of Guernsey?
- How robust is the proposed supply chain to any future changes to policy or technology?
- How well does the option meet the critical success factors for the Programme?

The preferred option will then be selected based on a balanced evaluation of each of the above criteria.