# GT3 & GD3 Asset Health Engineering Justification Framework Template

**Table of Contents**

*The Engineering Justification Paper must contain a table of contents and page numbers. We would expect any Engineering Justification Paper to be a maximum of 40 pages. Appendices are not included in the 40 pages count limit. Any Appendix referenced in the main body of the report must reference the specific section of the appendix to be reviewed.*

**1. Summary table**

*The following table sets out the key information on the project that the company must provide to Ofgem. This table must be produced at the beginning of each Engineering Justification Paper.*

|  |  |
| --- | --- |
| **Name of Project** | *Working Title of Scheme/Programme* |
| **Scheme Reference** | *Company identifier for scheme* |
| **Primary Investment Driver** | *Asset Health/Load/Environmental/VIP etc.* |
| **Project Initiation Year** | *Year of first project spend* |
| **Project Close Out Year** | *Year that project is fully commissioned* |
| **Total Installed Cost Estimate (£)** | *Current view on total installed cost of the preferred option.* |
| **Cost Estimate Accuracy (%)** | *Indication of accuracy of cost estimate* |
| **Project Spend to date (£)** | *Total monetary value spent on project to date* |
| **Current Project Stage Gate** | *Progress in company project process* |
| **Reporting Table Ref** | *Where in BPDT volumes/costs/outputs are recorded* |
| **Outputs included in RIIO-GT3 and RIIO-GD3 Business Plan** | *Yes/No – where yes, to be fully declared in document* |

*We expect the Spend apportionment table below to be merged with the summary table above but have included separately for accessibility purposes. The apportionment should detail the spend for the project over multiple price controls, if applicable. G3 would represent the request for this submission.*

|  |  |
| --- | --- |
| Spend Apportionment (£m) |  |
| **G2** |  |
| **G3** |  |
| **G4** |  |

**2. Executive Summary**

*This initial section should provide a succinct overview of the Engineering Justification Paper. It should summarise the key points including the primary issues addressed, proposed solution(s), and the expected outcomes and benefits. It should encapsulate the rationale for the investment and be no more than a single page. A simple cost and volumes table should be included in this section for both this price control and the previous (an uplift to the GD2/GT2 allowance will be required for comparison purposes).*

**3. Introduction**

*The introduction should provide a brief narrative of the project and highlight how the worklist has been generated (e.g. based on specific known issue, from asset health management tool or ongoing programme etc).*

**4. Equipment Summary**

*This section should contain a high-level summary of the operation of the equipment discussed in the justification and include global summary data on the equipment, such as:*

* *Global equipment count (i.e. how many preheaters or governors are installed on the network each should be listed as a line item)*
* *Where appropriate a breakdown of the manufacturers/models of equipment installed in the network*
* *Location on the network (site specific where appropriate)*
* *Normal operating modes*
* *Pressure ratings*
* *Redundancy architecture (i.e. duty/standby etc.)*
* *Single feed indication*
* *Health score at the beginning of the price control,*
* *Planned intervention description (if applicable)*
* *Health score at the end of price control*
* *Conformation of investment in GD1 or GD2*
* *Monetised risk*

*This information can be included as an excel spreadsheet as an appendix.*

**5. Problem/ Opportunity Statement**

*This section should define the problem that the spend seeks to solve. This section must explicitly answer the following questions:*

* *Why are we doing this work and what happens if we do nothing?*
* *What is the outcome that we want to achieve?*
* *How will we understand if the spend has been successful?*

**5.1 Narrative Real Life Example of Problem**

*This section should set out a narrative real life example of the problem that the spend seeks to solve. This section can contain drawings, photos or charts that help to convey the issue with the assets requiring spend and also highlight the outcomes/near misses which occur in real life with this asset class.*

**5.2 Project Boundaries**

*The boundaries of the spend proposed by this justification paper should be summarised here, for example, the spend will only replace/repair/renovate the pre-heaters at our sites and does not include costs to remediate associated pipework/site facilities/control systems etc.*

**6. Probability of Failure**

*This section should provide a narrative of data on the probability of failure of the equipment. This section should set out:*

* *The likely failure modes of the equipment considered by the assessment*
* *The failure rates assumed for each failure mode*

*This is important information which helps to justify the investment and it needs to be conveyed in a simple, consistent and coherent manner. For example, it is important to separate the effect that asset ageing has on the probability of failure from the inherent probability of failure of a given piece of equipment. This section should act as a sense-check on the data output from the asset management tool.*

**6.1. Probability of Failure Data Assurance**

*The probability of failure data drives the justification for these types of investments. This section should contain a discussion on the level of confidence the company has in the probability of failure data for the requested spend. This could be based on a summary of the sample size for a valve population for example.*

**7. Consequence of Failure**

*The consequences of failure of the equipment should be set out to help the reader understand the impact if the equipment fails to operate as expected. Generally, the consequence of failure should be split into the following consequences:*

* *Loss of supply to customers*
* *Safety impact of failure*
* *Environmental impact*

*This section should be broadly aligned with the failure modes identified in section 4 and should contain multiple supply and demand scenarios rather than a single case. Providing consequence of failure data for multiple supply and demand scenarios will help to justify the investment and this is a core component of this section.*

**8. Options Considered**

*This section should contain a summary description of all options considered including deferral of spend or do nothing options. This section focuses on the engineering options open to solve the problem described in section 3. The option scope will change between equipment types but generally it is expected that the following options would be included:*

* *Replace on Failure*
* *Repair on Failure*
* *Pre-emptively replace*
* *Pre-emptively repair*
* *Do nothing*

*The use of diagrams and simple drawings to convey the engineering scope is encouraged. This section can also quote expected reductions in monetised risk from the network’s NARM model to help convey the relative benefits between each option.*

*The section structure allows one sub section to be created for each option with the final sub sections holding summary tables collating technical and cost data separately.*

**8.1 First Option Summary**

*Each option considered in the paper should have its own subsection which describes the option and repeating until all options have been discussed. Each sub section should describe:*

* *The technical detail of the option i.e. capacity, system rating, availability etc.*
* *The basis for the cost estimate/unit cost*
* *The perceived benefits of the option*
* *Delivery timescales*
* *Key assumptions made*
* *Any other items that differentiate the option from the others considered.*

**8.2. Options Technical Summary Table**

*To help with the option comparison process a simple table holding key details for each option should be produced. The table should allow a “side by side” comparison of the key differentiating data for each option. The table must include, as a minimum, the following information:*

* *Sensible option title which helps to describe the scope. Avoid labelling options 1/2/3/4/5 etc.*
* *First Year of Spend*
* *Final Year of Spend*
* *Volume of interventions*
* *Equipment or investment design Life*
* *Total installed cost (Total Spend request)*
* Options Cost Summary Table

*This section should contain a simple table which provides a breakdown of the costs for each option discussed in section 6.*

*It is appreciated that there will be a range of costs/unit costs which are used for this type of spend and a rigid format for this table has not been presented as a result. The cost breakdown should allow the reader to understand where the differences in costs for each option occur by reporting the breakdown at an appropriate level i.e. listing the cost of equipment, costs of civils, engineering costs, contingency etc. etc. for each option.*

**9. Business Case Outline and Discussion**

*This section should tie together the probability of failure, consequences of failure, engineering options and costs to investigate the optimum solution to the problem described.*

**9.1 Key Business Case Drivers Description**

*This section should set out the business cases which display the perceived value for each option considered. The key value drivers for each option should be clearly highlighted to allow a judgement to be made on the validity of each option. This section replicates data from the CBA but it is important to provide justification behind the value drivers to ensure that they are aligned with the engineering scope.*

**9.2 Business Case Summary**

*A summary table with the selected headline business case metrics should be provided in this section to enable a high level comparison of the options.*

**10. Preferred Option Scope and Project Plan**

**10.1 Preferred Option**

*This section should state the preferred option and is included to avoid ambiguity in the conclusions of the paper.*

**10.2 Asset Health Spend Profile**

*This section should contain a simple spend profile detailing when the interventions for the selected option are expected to take place. To give the reader confidence that the spend being requested is achievable during the RIIO-3 price control.*

**10.3 Investment Risk Discussion**

*Asset health spend, where average failure rates and unit costs are applied across a relatively large asset population, carries varying levels and types of risk. It is expected that mitigation measures would be put in place to reduce both consumers’ and companies’ exposure to these risks as a normal part of the investment planning process.*

*This section allows the company to present the risks associated with the preferred option and provides an opportunity to highlight the measures put in place to mitigate those risks. This section can include notes on the risks and mitigations associated with the unit costs used, ability to liquidate workloads or potential for changes to volumes based on external factors, but the section should be focused and bespoke to the spend covered in the paper.*

**10.4 Project Plan**

*This section should set out the project plan and highlight key dates. At a minimum, it must include the following elements:*

* *Progression through stage gate process*
* *Purchase of any long lead items*
* *Commissioning Dates*
* *Key Operational milestones*

*A simple excel based plan is suitable for this section.*

**10.5 Key Business Risks and Opportunities**

*Key risks to delivery of the project and opportunities should be listed in this section along with the potential impact on costs. This section must answer the following question:*

* *What changes to the system operation or supply/demand scenario are required to alter the outcome of this justification paper?*

**10.6 Outputs included in RIIO-GT2/GD2 Plans**

*This section should describe/list scheme outputs included in RIIO-2 plans but not carried out. It should also include a detailed explanation of the reasoning for re-inclusion in RIIO GT3 -GD3, i.e. deferral, substitution, late delivery etc.*