Risk Governance Framework for Procurement in Future Fuels – Final Report

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Risk Governance for Procurement in Future Fuels

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IMPORTANT DISCLAIMER

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Summary of Report

Excellence in the governance of procurement risk is a key success factor for the gas industry in working to deliver decarbonised energy.

Procurement is a complex process and while the gas industry has done well in this area overall, there is still room for improvement and value in reflecting on particular procurement issues posed by future fuels projects linked to hydrogen and biogas and other possible fuels. This project aims to develop an understanding of the practices that can be implemented to improve risk governance in the gas sector and across the energy sector more broadly. Such understanding will encourage the diligent and established application of risk mitigation measures in the procurement practices implemented for future fuels infrastructure and technology development.

Procurement is a series of planning, organising and coordinating processes used by an organisation to obtain goods and services from an external source. In this project, we consider that procurement fails when failures in procurement planning, specification, purchasing, manufacturing, or delivery of goods or services result in a project failing to meet stakeholder objectives, both short and long term.

The first interim report addressed procurement risks, past procurement incidents and lessons to be learned from those failures. In the second interim report, the views and insights of industry stakeholders into the ways in which procurement can fail were reported along with their views on practices that might be adopted to prevent such failures. Drawing from successful practices and new perspectives to reduce risks associated with the procurement process in the gas industry, the final stage of the project is to focus on the risk governance framework to improve procurement outcomes in a future fuels environment.

The Risk Governance Framework for Procurement in Future Fuels presented in this final report sets out twelve principles and default practices that are expected to be routinely applied in a project environment and in operations. The principles and default practices that underpin them are established by adopting an “if not, why not?” approach, i.e., they should be applied, and where any default procurement practices are not to be applied, justifications should be provided as to why they are not being followed.

Each principle also specifies key considerations with a list of reflective questions that both owners or purchasers and suppliers/service providers should ask themselves to ensure the principle and practices are adequate for a given procurement activity.

The Framework applies equally to both purchasers and suppliers/service providers. It aims to reduce the risks of unplanned outcomes caused by failures in procurement practices and improve the performance of all participants involved in procurement in the emerging future fuels industry for the delivery of safe and reliable new infrastructure and technologies.

1. Introduction

The development of a new future fuels sector in Australia represents a major opportunity for the gas industry. The reputation of this emerging sector will depend on the successful execution of early projects as any major failures will be a reflection on the sector as a whole. For all major infrastructure projects, one key issue is successful supply chain management. This research aims to support risk management in procurement in the context of future fuels. Specifically, the research aims to reduce the risk of unplanned outcomes caused by failures in procurement practices within the supply chain and support the emerging future fuels industry to meet societal expectations for delivery of safe and reliable new infrastructure and technologies.

Despite the criticality of procurement procedures and supply chain management in the successful execution of infrastructure projects, there have been many examples of procurement failures leading to unplanned adverse outcomes including:

- NSW trains too wide for tunnels (2018)
- Grenfell Tower fire (2017) and other building sector incidents
- South Korea nuclear reactor shutdowns (2013)
- HMAS Westralia (1998)
- Canberra Hospital Implosion (1997)

The gas industry has not been immune from such incidents although specifics are often not readily available to share due to commercial/legal issues.

Cost and schedule implications of late delivery of procured items, potential safety risks as a result of counterfeit items, and failures to meet expectations for levels of service provided are among the common issues. Widening of NSW railway tunnels to allow for incorrectly specified new trains cost the NSW government $75 million[1]. The cost of replacing off-specification flammable cladding in Victoria is estimated to be between $250 million and $1.6 billion[2].

Failures of materials, equipment or services through ineffective supply chain risk management represent threats to the successful development of the emerging hydrogen and biogas future fuels industry. In addition to the potential for major cost and schedule blowouts, failures on any early project in this new industry could cause significant reputation damage and so adversely impact the development of the entire sector. Research into effective mitigation of such threats is warranted to ensure that societal expectations for public safety are met and that the reputation of both organisations and new technologies are protected.

With these factors in mind, research questions addressed by this project are:

- Why have past significant procurement failures in the gas industry and elsewhere occurred? What can be learned from them?
- What are the risks associated with the procurement process in the gas industry and what risk governance practices can be used to prevent the recurrence of procurement failures in the context of future fuels?
- What does a robust procurement risk governance framework look like in a future fuels environment?

In the first task of the project, a review of academic, grey, government and industry literature on procurement risks and associated failures was conducted. These include identification and analysis of risks on the supply chain coordination and management process and the supply side, risks from the external environment, and risks related to trust and cooperation.

[1] https://www.smh.com.au/national/nsw/blue-mountains-rail-line-gets-75-million-upgrade-20181218-p50mxn.html
[2] https://theconversation.com/flammable-cladding-costs-could-approach-billions-for-building-owners-if-authorities-dither-118121

Nineteen procurement-related incidents were also identified in the public domain to investigate procurement issues and analyse lessons learned from them to prevent the recurrence of future failures.

Finally, documented procurement practices and guidance on best practices in procurement risk governance were also discussed.

The second task of the project commenced with 56 interviews with key stakeholders across the entire supply chain for procurement of both goods and services in a project environment and in operations. The aim is to gather stakeholder experiences and their views on procurement risk management and how it will change in the context of future fuels.

Drawing from the results of the first two tasks, the final task reported on here comprises a best practice framework for risk governance in procurement, taking into account the new and novel aspects of future fuels project activities. This framework provides practical guidance for member companies involved in the development of pipelines, hydrogen generation and storage, production of biogas and renewable power generation to support procurement risk minimisation.

The overall outcome from the project is an understanding of the practices that can be implemented to improve risk governance in the gas pipeline sector. Such understanding will encourage the diligent and established application of risk mitigation measures in the procurement practices implemented for future fuels infrastructure and technology development.

2. Effective procurement

The foundations of effective procurement are established at the earliest stage in any project. An in-depth understanding of requirements is required along with any potential issues that might arise during the whole procurement process plus how best to resolve them.

The framework for effective procurement has been established based on theoretical foundations of procurement risks and procurement failures, and then the process of how to detect potential issues and reduce negative outcomes as well as improve performance and enable more efficient use of resources by applying best procurement practices.

2.1. Definitions

This research is grounded in the idea of how best to manage the risk associated with procurement failure, so it is important to define some key terms.

Procurement is a series of planning, organising and coordinating processes used by an organisation to obtain goods and services from an external source (Turban et al., 2017).

In this project we consider that *procurement fails* when failures in procurement planning (scoping or contracting); specification, purchasing, manufacturing, or delivery of goods or services result in a project failing to meet stakeholder objectives (both short and long term).

This implies that failures can occur at various stages along the supply chain. It should also be noted that stakeholders can have differing objectives so views on whether, and the extent to which, failure has occurred are at least partly a social construction.

The project draws on ISO 31000 for language related to risk. *Risk* is defined in the standard as the effect of uncertainty on objectives, noting that an effect is a deviation from the expected (ISO, 2018). In ISO 31000, effects can be positive or negative but, in this project, we focus on negative effects.

In the language of ISO 31000, objects, events or circumstances that have the potential to give rise to risk are called *risk sources*. An outcome impacting objectives is a *consequence*, noting that consequences can escalate due to cascading and cumulative effects.

2.2. Organisational failures

Many of the risk sources in procurement are organisational so it is important to set out the way in which the work conceptualises organisational failure as opposed to human error.

One of the most well-known models of organisational accidents is James Reason's Swiss Cheese Model of Accident Causation shown in Figure 1 (Reason, 1997). In this way of thinking about accidents, there is a range of defences in place that are functionally designed to prevent any given hazard from leading to a loss of some kind (such as an accident). In practice, these defences are imperfect (like holes in Swiss cheese). The various hardware and procedural measures in place ensure that failure of any individual measure is not catastrophic. An accident occurs when the holes in the cheese line up and provide an accident trajectory through all of the defences.

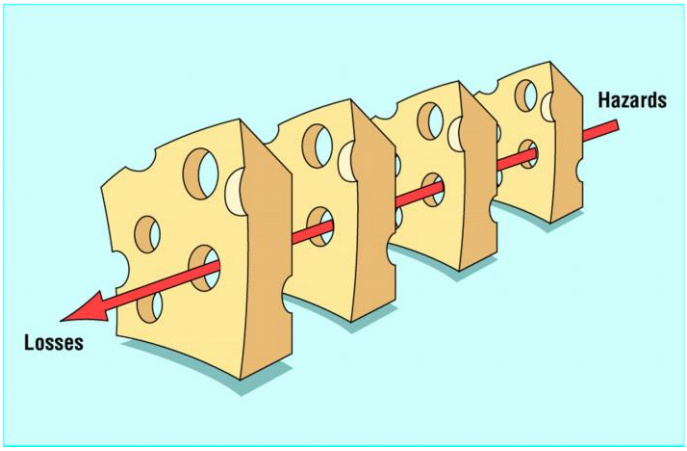

Figure 1. Swiss cheese model

In this model, the “holes” in the cheese have two interesting features. First, they may be due to active failures, such as the mistakes or non-compliant behaviour of frontline operators, or they may be due to latent failures. Latent failures are weaknesses in the system that do not, of themselves, initiate an accident, but they fail to prevent an accident when an active failure calls them into play on a given day. Problems arise when latent failures in the system accumulate – maintenance is not done, records are not kept, audits are not done. The consequence of a small active failure can then be catastrophic as the protective systems fail to function as expected.

The second feature of the holes in the Swiss cheese is that they are a function of the organisation itself. In this model of accident causation, operator actions in the field are linked to workplace factors, such as competency, rostering, control room design, task design, etc., and these issues are linked to organisational factors such as budgets, safety priorities, management styles, etc. In this way of thinking about safety defences, the performance of all components in the system is interlinked.

2.3. Sources of data on procurement risks and good practices

All procurement is exposed to many kinds of risks including uncertainties in price, lead time and demand so managing risks is an integral part of procurement governance and planning. A risk management plan at the project planning stage should consider potential risks at all stages of the procurement process. The objective of this process is not only to detect potential issues early and reduce negative outcomes, but to identify opportunities to improve performance, enable more efficient use of resources and increase the probability of success.

Known procurement risk sources and consequences

In the first stage of the project, a review of academic, grey, government and industry literature on procurement risks and associated consequences was conducted. A taxonomy of procurement risk sources has been adapted from the taxonomy of supply chain risks in large-scale engineering and construction projects developed by Rudolf and Spinler (2018).

Table 1 exhibits an overview of the potential procurement risk categories and risk sources. There are four main risk categories including (1) supply chain coordination and management; (2) supplier; (3) external environment and (4) cooperation and trust. Risks in the supply chain coordination and management category are internal to a purchasing firm, whereas supplier risk sources are external to the firm but still within the internal supply chain networks. External environment risks are changes in external factors beyond a firm’s control that can adversely impact the supply chain. Cooperation and trust risk sources result from individual and organisational factors that have been considered as highly important for large-scale projects.

Table 1. Key procurement risk sources in supply chain identified from the literature

Risk category	Risk source
Supply chain coordination & management	Planning and forecasting Demand and scope changes Scope and baseline specifications Supply chain configuration Contractual terms and conditions Logistics Quality assurance/Quality control Risk management Experience and expertise Communication Cash flow management Inventory Corporate social responsibility
Supplier	Performance & operations Financial stability Supplier behaviour Infrastructure & resources Supplier environment & market Supplier experience & expertise Sub-suppliers
External environment	Law & regulations Standards & codes Economic Political & governmental Natural events Environment, health & safety Sociocultural
Cooperation & trust	Trust and relationship issues Organisational and cultural issues Conflict

Lessons learned from past procurement failures

The next step of the literature review was to investigate procurement-related incidents in major projects and in the operation of complex facilities and draw lessons learned from those failures. Nineteen cases were identified in the public domain in different sectors, including construction, transport, energy, aviation, and oil and chemical process industries, to explore why procurement went wrong and what can be learned from them to prevent the recurrence of future procurement failures (Table 2). Most of these are either public sector project failures with significant cost and/or schedule overruns or cases where the consequences of the failure were safety-related. Main issues associated with procurement range from the use of non-compliant or non-conforming materials or products to specification or design failure and inadequate planning or selection of suppliers and service providers.

Table 2. List of procurement-related incidents

	Incident	Sector
1	Lacrosse apartment fire	Building
2	Grenfell tower fire	Building
3	Hyatt Regency walkway collapse	Building
4	Opal tower cracking	Building
5	Channel tunnel	Infrastructure
6	Demolition of the Royal Canberra hospital	Infrastructure
7	I-90 tunnel ceiling collapse	Infrastructure
8	Berlin-Brandenburg airport project delay	Infrastructure
9	NSW public transport failures	Infrastructure
10	The CBD and Southeast light rail project	Infrastructure
11	Loss of space shuttle Challenger	Aerospace
12	Boeing 737 MAX failure	Aviation
13	The Myki ticketing system	ICT-based transport
14	HMAS Westralia ship fire	Maritime
15	South Korean nuclear reactor shutdown	Energy
16	Cabin Creek hydroelectric tunnel fire	Energy
17	Explosion at Shell in Moerdijk	Chemicals
18	Fireworks disassembly explosion and fire	Chemicals
19	Buncefield explosion and fire	Oil & gas

Details on procurement risks and procurement failures informed by the literature are in Interim Report #1 published on the FFCRC website in March 2022.

Procurement risks and procurement practices in the gas pipeline sector and in a future fuels environment

The focus of the second stage of the project was fieldwork with key stakeholders across the entire supply chain for procurement of both goods and services in a project environment and in operations. The aim is to gather stakeholder experiences and also their views on procurement risk management and how it will change in the context of future fuels. The target population for the interviews includes professionals involved in procurement across the energy sector from gas pipeline owners/operators to suppliers, consultants, specialist service providers and regulators.

Fifty-six interviews were conducted in a semi-structured approach with the conversation significantly driven by the responses of the interviewees. Recordings of interviews were professionally transcribed and then coded in NVivo. An inductive approach was used to develop themes about procurement risks. These themes were then grouped into four groups informed by the literature conducted in the first stage of the project (Table 3).

Table 3. Common themes on the pipeline sector procurement risks drawn from interviews

Risk category	Risk source	Interview theme on risk
Supply chain coordination and management	Planning & forecasting	Inadequate planning
	Scope & baseline specification	Problems with specifications (e.g., incomplete specs, bespoke specs)
	Supply chain configuration	Poor contractor/supplier selection
	Contracting strategy	Risk transfer rather than risk sharing
		Contract disputes
	Logistics	Problems with logistics (e.g., damages in transit, delays to delivery)
	Quality assurance/Quality control	Manufacturing QA/QC failures
	Risk management	Inadequate safety management processes
	Experience & expertise	Inadequate operational and project management experience & expertise
	Communication	Inadequate communication
Suppliers	Performance & operations	Manufacturing problems
		Non-compliance
	Supplier behaviour	Forged certificates/counterfeit materials
	Supplier experience & expertise	Skilled resource shortage
	Supplier environment & market	Market burst
	Sub-suppliers	Inadequate prequalification processes
External environment	Law & regulations	Uncertain timeframe for environmental approval and land access
	Standards & codes	Differences in standards
	Economic	Foreign exchange rate
		Price uncertainty
	Political & governmental	Unpredictable trade behaviour
	Natural events	Shipping and travel disruptions due to Covid-19 pandemic
Trust and cooperation	Trust issues	Trust/relationships issues between clients and suppliers
	Organisational and cultural issues	International relationships
		Cultural issues
		Cross-sector cooperation

A wide range of risks have been reported by interviewees with the five most commonly occurring in interviews identified as: (1) inadequate planning, (2) problems with specifications, (3) poor contractor/supplier selection processes, (4) logistics issues (e.g., damage in transit, delays to delivery and custody transfer) and (5) manufacturing QA/QC failures. These all originate from the supply chain coordination and management process rather than from the supplier's side. Another issue from the external environment that was frequently mentioned is shipping and travel disruptions as a result of the Covid-19 pandemic, which has significantly impacted global supply chains.

Procurement risks and procurement good practices in the gas pipeline sector suggested by industry stakeholders are described in Interim Report #2 published on the FFCRC website in July 2022. Challenges in relation to procurement risk governance in a future fuels environment have also been identified with four issues being highlighted as the most challenging: (1) planning, (2) skill resources, (3) standards and (4) regulation.

New perspectives towards a risk governance framework

The second report identified and discussed five new perspectives that have been used to develop a risk governance framework for procurement in the context of future fuels, including uncertainty, interface management, resilience, temporality and high-reliability networks. These perspectives have been useful to determine an appropriate risk governance framework for future fuels that builds on the industry's procurement successes, taking into account past procurement failures and addressing the unique circumstances posed by future fuels.

Risk Governance for Procurement in Future Fuels

The first interim report addressed procurement risks and past procurement failures and their causes. In the second report, industry stakeholders have provided many insights into the ways in which procurement can fail and what practices might be adopted to prevent such failures. Drawing from the good practices and new perspectives to reduce risks associated with the procurement process in the gas industry, the final stage of the project is to focus on the risk governance framework to improve procurement outcomes in a future fuels environment.

3. How to use the framework

The Risk Governance Framework for Procurement in Future Fuels (Risk Governance Framework) sets out twelve principles and associated default practices that are expected to be routinely applied in a project environment and in operations. The principles and the default practices that underpin them are established with an “if not, why not?” orientation, i.e., they should be applied and where any default procurement practices are not to be applied, justifications should be provided as to why they are not being followed.

Each principle also specifies key considerations with a list of reflective questions that both owners or purchasers and suppliers/service providers should ask themselves to ensure the principle and practices are adequate for a given procurement activity. The question sets can be used in several ways:

- Informally by those involved in procurement to inform decision making
- As the basis of more formal reviews of procurement plans conducted by individuals or in a workshop setting.

Special considerations for procurement of goods and services in a future fuels context are also included in each principle to account for the new and novel aspects of future fuels project activities and their potentially high levels of uncertainty and complexity.

The Framework applies equally to both purchasers and suppliers/service providers. It aims to reduce the risks of unplanned outcomes caused by failures in procurement practices and to improve the performance of all participants involved in procurement in the emerging future fuels industry for delivery of safe and reliable new infrastructure and technologies.

The Framework focuses on identification of risks, rather than providing detailed prescriptive advice regarding how best to manage risks. There are two reasons for this. In general, failures happen because people can’t imagine them. This framework promotes reflection on what risks may be present in any given procurement situation. Once they have been identified, risk mitigation/control is the next step, and generally speaking, mitigation is relatively straightforward once a failure mechanism is understood. In addition, the range of procurement activities in the gas industry is wide, so fit for purpose and specific risk mitigation must be highly context specific and is not amenable to general guidance such as contained here.

The structure of the Risk Governance Framework is based on the *Framework for Establishing Effective Project Procurement for the NSW Infrastructure Program* (Infrastructure NSW, 2021).

4. Principle 1: Develop a clear scope and specifications and communicate them clearly

Successful procurement starts with a clear understanding of the overall scope of what is to be procured and a robust specification of individual items to be purchased. Having the scope and specifications clear at an early stage sets up a project for success. On the other hand, the record of procurement failures shows that many problems can be tracked back to detailed work commencing before the scope was clear and/or orders being placed based on incomplete specifications.

Time spent in the early stages of procurement to get these aspects right is well invested and is likely to be recovered many times over as purchasing proceeds more smoothly without the need for rework.

In the context of future fuels, rapidly developing technology and few suppliers mean that uncertainty is high and changes (in standards, legislation, and technology) are likely as procurement proceeds.

4.1. Default practices

1. Allocate sufficient time and resources to understand the detailed nature of the work and associated requirements and constraints (technical, logistical, financial and resourcing).

2. Involve the right experts in writing specifications.

3. Clearly and precisely communicate needs, requirements and the end goal to suppliers/service providers.

4.2. Key considerations – Purchasers

- Are the project description, scope and requirements clearly articulated for the target audience?
- Are we aware of the uncertainties inherent in the procurement scope and key specifications? Do we have systems in place to adequately identify and address such uncertainties?
- Have we sought out and considered lessons learned from past procurement successes and failures?
- Are responsibilities (for completing work and for identifying and acting on problems) clearly set out and understood by all parties?
- Have all likely operating conditions been considered for this material/item in both specification and testing requirements?
- How much “cut and paste” from past projects have we done in preparing specifications? Are we sure that what we have specified is right for this project?
- Have legislative and standard compliance issues been considered?
- Have we standardised the design as much as feasible and minimised our reliance on bespoke items?
- Have we confirmed that any overseas manufacturer/supplier is familiar with Australian standards that have been specified?

4.3. Key considerations – Suppliers/Service providers

- Is there enough information to clearly understand what the client wants?
- Is it clear which parties are supposed to do what in meeting these requirements?
- Have we run into difficulty in the past trying to meet similar requirements? How can we prevent past problems recurring?
- Can we undertake or arrange for all necessary testing to demonstrate both quality and compliance with the specifications?
- Is the client open to consideration of a change in the specification to accommodate a standard design product that we can offer more cost-effectively?
- Does the client understand what we can offer? How can we better communicate this?
- Have we clearly communicated client's requirements about the scope and specifications to sub-suppliers/subcontractors?
- Do we have a realistic understanding of the capacity of sub-suppliers/subcontractors to meet the client's requirements?
- Have we confirmed that all our sub-suppliers are familiar with the Australian standards that have been specified and can deliver compliant products?

4.4. Special considerations for future fuels

- Have we thought about how our past procurement practices, knowledge and experience apply to the needs of future fuels procurement?
- Have we considered current relevant research in developing our scope and specifications? Is there a process in place to keep up to date with new research as the project progresses?
- Have we adequately considered requirements around safety and controls, particularly for bespoke items, in the absence of relevant standards?
- How do we minimise risks related to meeting technical requirements under existing legislation and standards that are still being developed or updated?
- Have the scope of work and requirements been clearly defined and well understood by overseas manufacturers who may not be used to working in the Australian gas sector?

5. Principle 2: Establish a strong client team to get the best procurement outcomes

The client (purchaser) team ultimately makes the most important decisions about how procurement will proceed. Such decisions need to be grounded in the best technical and commercial expertise, and made in a timely manner, for procurement to be successful. A weak client team can lead to confusion and mismatched interfaces between suppliers/service providers.

Timely and informed decision making from the client team is particularly critical in the context of future fuels, given the dynamic environment.

5.1. Default practices

Ensure that the client team has the necessary resources and expertise for procurement oversight and interface management.

5.2. Key considerations – Purchasers

- Do we have the right knowledge to effectively manage all aspects of procurement, including possible supply chain disruptions?
- Do we have sufficient resources to make decisions in a timely and decisive manner?
- Should we appoint an interface coordinator to focus specifically on interface coordination and management, e.g., checking activities undertaken at the interfaces and verifying information shared between interfaces?
- Should we develop a program of independent review? At what points would independent reviews provide useful feedback?

5.3. Key considerations – Suppliers/Service providers

- Are there risks for us in working for this particular client team, e.g., do they have experience in this type of procurement? How do we best manage any risks?

5.4. Special considerations for future fuels

- Are we aware of the new technologies and operational nuances of future fuels? How will we keep up to date on these topics as the project progresses?
- Are we alert to unknown unknowns when making decisions in the future fuels context?
- Have we developed a collaborative mentality within our team for devising ideas and resolving problems when dealing with new technologies in the future fuels context?
- Are we well networked with other similar projects (both locally and internationally), or should we put more effort into networking and benchmarking?
- Are there strategies in place to upskill our team for adopting the new technologies?

6. Principle 3: Develop a realistic plan to address delivery risks

Getting things done on time and within budget requires realistic goals and an effective plan to meet them. Time spent on planning to clearly understand interconnections and critical paths is time well spent. This is particularly the case for complex procurement settings. The organisational fragmentation inherent in procurement of large projects creates many interfaces which are known as structural weaknesses in any organisations. Adequate planning is essential to ensure successful integrated system performance.

In the current supplier-driven market, realistic planning is especially difficult for future fuels procurement.

6.1. Default practices

1. Develop a realistic schedule and cost estimate to drive and benchmark progress.

2. Conduct risk assessment with consideration of delivery risks including legal and environmental requirements.

3. Consider ordering long lead items early to minimise delivery risks.

6.2. Key considerations – Purchasers

- Do we have sufficient/suitable scheduling resources to develop a realistic timeline and keep track of progress?
- Has the project plan been benchmarked against similar projects?
- Have we allowed sufficient time and costs for land access negotiations and environmental approvals?
- Have we considered uncertainty regarding possible changes in legislation, foreign exchange rate, etc., which might impact delivery?
- Have we allowed contingencies and redundancies to address potential unknown unknowns?
- Have we identified likely long lead items and considered the best way to ensure timely delivery? Do we understand the risks introduced by locking in specifications for long lead items?
- Is there a mechanism for regularly reviewing the plan and making adjustments as necessary?
- Do we have reliable evidence that claims made by suppliers regarding delivery time throughout the procurement process are realistic?
- Are timelines and cost estimates realistic, or are we suffering from optimism bias?

6.3. Key considerations – Suppliers/Service providers

- Are the required delivery schedules and costs realistic?
- Can we meet the contracted deadlines and cost requirements while ensuring the required quality of the goods/services provided?

- Have suggestions been provided to the client to avoid compressed timeframes and minimise delivery risks?
- Do sub-suppliers/subcontractors have the ability to meet the timeline requirements? Do we have reliable evidence that claims made by suppliers regarding delivery time are realistic?

6.4. Special considerations for future fuels

- Have we considered the likely different supplier behaviours brought about by the competitive market for future fuels equipment and the potential impact on schedule and cost?
- Have we considered additional time and resources required for addressing quality requirements for hydrogen equipment, particularly long lead items?
- Are there changes in priorities and logistics of delivery in the future fuels context?
- Are plans flexible enough to allow for changes resulting from unknown unknowns inherent in the transition to future fuels?

7. Principle 4: Ensure quality is a priority for everyone

In the pipeline sector, quality must be the first priority as the consequences of putting poor quality systems into service are so serious. High quality goods/services are not necessarily the most expensive, but rather they conform to the requirements of technical specifications and the scope of work. Everyone has a role in ensuring a quality outcome from procurement.

Procurement for future fuels involves dealing with new suppliers who may have limited understanding of normal quality requirements in the gas industry, so fundamental expectations must be clearly articulated.

7.1 Default practices

1. Ensure that quality is given as much attention in all communications as cost and schedule and is understood to be the responsibility of all parties.

2. Ensure quality requirements are consistently communicated across supply chain interfaces.

7.2 Key considerations – Purchasers

- Is quality seen as only the responsibility of the quality department, or does everyone understand they have a role to play in obtaining a quality outcome?
- Is quality included in responsibilities for all position descriptions?
- Is quality a standing agenda item in all project meetings?
- Have all concerns about quality been addressed?
- Are quality results widely communicated and successes celebrated?

7.3 Key considerations – Suppliers/Service providers

- Are the goods/services provided of appropriate quality in addition to meeting cost and schedule requirements?
- Have all sub-suppliers/subcontractors been well informed of quality requirements and expectations?
- Have quality-related issues, if any, been communicated to the client early?

7.4 Special considerations for future fuels

- Do all suppliers (of both goods and services) understand normal practice regarding quality in the gas industry and how it transforms for future fuels?
- Is there a need for new quality control practices and metrics in the transition to future fuels?

8. Principle 5: Maintain strong links between procurement and operations

A significant part of ensuring a high quality and timely outcome at a reasonable cost is to link procurement tightly to operational requirements. This consideration applies at all project stages.

Given the general lack of operating experience, this requires a particular focus on future fuels to determine how operational issues can be anticipated and considered in procurement.

8.1 Default practices

1. Include operational expertise in the procurement process from concept development onwards.

2. Conduct cross-functional reviews such as constructability workshops involving design, procurement, construction and operation.

3. Consider having a separate operational readiness team.

8.2 Key considerations – Purchasers

- Are there significant uncertainties in any of the operational interfaces? If so, are the risks managed sufficiently?
- Is operations input to decision making structured to give the right balance between short-term cost imperatives and gold plating for long-term benefits?
- Have all relevant parties been involved in cross-functional reviews? How have we considered their input and closed out issues raised?
- Have we considered the impact on operational resourcing (both people and things)?

8.3 Key considerations – Suppliers/Service providers

- Do we understand the long-term operational requirements/implications of what we are providing?
- Have we provided input to improve the constructability of design and mitigate issues that are likely to cause problems in the later project stages?

8.4 Special considerations for future fuels

- How can we draw on both internal (if relevant) and external operating experience with similar systems?
- Are we recruiting new operating personnel early enough for them to learn about the new technologies throughout procurement?
- Have we considered new operational requirements in the design process for future fuels projects?
- Have we considered the full range of future operating modes in all procurement activities?

9. Principle 6: Choose the right supplier/service provider and the right contracting strategy

Choosing the right supplier or service provider is a key step in ensuring successful procurement outcomes. The cheapest supplier is only the right supplier when they can also meet the necessary technical requirements. The relationship between purchasers and suppliers is also critical and is driven significantly by the contracting strategy that the purchaser chooses to use.

In the context of future fuels, supplier options may be limited in the current seller-driven market. The paucity of suppliers impacts both availability and contract terms.

9.1 Default practices

1. Develop comprehensive supplier/service provider selection and evaluation criteria.

2. Separate technical and commercial tender evaluation to avoid selecting a cheap bid that is not technically acceptable.

3. Choose the contracting strategy that matches the complexity of the procurement, the uncertainty in the supply chain and the experience of all parties.

4. Allocate each risk to the party best able to manage it.

5. Set up contractual terms and conditions with clear provisions on the responsibilities of each party, managing emerging/unforeseen risks and dispute resolution and avoidance.

9.2 Key considerations – Purchasers

- If bidders were colluding or any other corrupt practices were involved in our supply chain, how would we know? What would we do?
- Does the preferred supplier/service provider have sufficient capacity to deliver as contracted?
- Do we have evidence that the preferred supplier's schedule commitments are realistic?
- Have sub-suppliers/service providers been appropriately prequalified?
- Are appropriate quality control plans in place for all sub-suppliers/service providers?
- Have we frequently revisited and updated the preferred supplier/service provider lists? Have alternative suppliers/service providers been identified?
- Does the chosen contracting strategy reflect the level of uncertainty in project scope and execution strategies? Have we considered the opportunity to adopt more collaborative contracting strategies (e.g., ECI and relationship contracting) for complex projects?
- If using an EPC contracting strategy, do we have sufficient visibility and transparency in what the EPC contractor is undertaking?
- Have we worked collaboratively with suppliers/service providers to identify and allocate risks? Is responsibility for each risk held at the level/location where it can best be managed?

- Do contractual terms and conditions establish common goals, or are we incentivising suppliers/service providers to act against our interests?
- Are milestone payments appropriately structured to meet suppliers/service providers' financial capacity?
- Are there any provisions for managing emerging or unforeseen risks?
- Are performance warranties structured so that entities are held responsible for things within their control?
- What interfaces are created as a result of the chosen contracting strategy?

9.3 Key considerations – Suppliers/Service providers

- Can we meet all criteria for the goods/services provided, e.g., price, availability, quality, experience, competence, health and safety records, integrity, etc.?
- Have we done enough due diligence upfront to ensure the function required by the client will be met?
- Can we demonstrate that our tender addresses technical quality and feasibility, not just commercial attractiveness?
- Have we actively been engaged in the contracting process to make sure contractual terms and conditions are clearly defined and mutually beneficial?
- Are the risk assessment and allocation clear and transparent between all parties? Is there any uncertainty about who should manage a particular risk? How is this best resolved?
- Do we have the capacity to manage the risk allocated to us?
- Do we have backup plans in case problems arise?
- Have we selected sub-suppliers/subcontractors considering factors of competency and quality apart from costs?
- Are terms and conditions clear in all subcontracts?
- Are responsibilities clearly defined in all subcontracts?
- Can the sub-suppliers/subcontractors manage the risk transferred to them, if any?

9.4 Special considerations for future fuels

- Are we prepared to demonstrate overall project viability to suppliers as may be required to gain their attention?
- Have we considered engaging our senior management into early negotiation and discussion with preferred vendors to secure their commitment?

- What sort of ongoing service support can suppliers provide in the longer term given a lack of in-house experience? Which suppliers have Australian-based technical support for special equipment needed for future fuels?
- Does the chosen contracting strategy allow us to develop relationships with new service providers? Will it focus on mitigating rather than transferring risks?
- Are the contracts adaptable and flexible for unknown unknowns associated with the transition to future fuels?
- Have we considered whether there are common knowledge gaps between us and our suppliers/service providers? If so, how do we address these knowledge gaps?

10. Principle 7: Ensure the procurement function supports technical objectives

The primary objective of any procurement activity must be to get the right technical solution in place in a timely and cost-effective manner. Time and cost must be secondary to technical requirements, and so the procurement function in organisations must be secondary to technical aspects of procurement. Problems arise when procurement personnel are incentivised to act in ways that are not ultimately in the project's best interests.

In a future fuels environment, the level of technical uncertainty makes it particularly important that procurement is a support activity, not the driver.

10.1 Default practices

1. Technical personnel should be involved in procurement decision making to balance technical requirements, cost and contractual risks.

2. Technical personnel should be appropriately consulted when changes are made to specifications for procured items.

3. Technical personnel and procurement personnel should develop a shared understanding and communicate consistent messages to suppliers/service providers.

10.2 Key considerations – Purchasers

- Does our organisation structure reflect procurement's role as a project support function and promote cooperation between technical and procurement personnel?
- Do procurement personnel have sufficient knowledge about the items they are procuring?
- Are procurement personnel incentivised to most effectively support the project objectives?
- Who is responsible for vendor management? Do they have sufficient resources and knowledge to do this effectively?
- Does our chosen procurement strategy introduce additional technical interfaces that require special management?

10.3 Key considerations – Suppliers/Service providers

- Are we able to communicate technical issues with the client team, including both technical and procurement personnel?
- Have we received consistent information and updates on requirements and expectations from the client?

10.4 Special considerations for future fuels

- What novel procurement functions may support the emerging technical objectives?
- Have we discussed and addressed procurement limitations that might impact technical outcomes in future fuels?

11. Principle 8: Actively communicate with service providers and suppliers

Successful project procurement is dependent on open communication, effective information sharing and a trusting relationship among purchasers and suppliers/service providers. Service providers and suppliers should be informed of any issues or concerns and appropriately consulted for decision making to drive positive project outcomes.

Again, the novel technologies being used in future fuels make active communication critical for procurement success.

11.1 Default practices

Ensure mechanisms/systems are in place for information sharing with suppliers/service providers.

11.2 Key considerations – Purchasers

- For key suppliers and service providers, are there regular meetings at multiple organisational levels to maintain focus on key outcomes?
- Have we identified and addressed communication barriers and trust issues to ensure openness?
- Is our approach to relationships with suppliers/service providers proactive rather than reactive, i.e., do we actively engage with them or plan only to communicate regarding penalties if problems occur?
- Are there opportunities for shared office space or other facilities that would increase communication?

11.3 Key considerations – Suppliers/Service providers

- Have issues and concerns been communicated early and frequently in meetings with the client and other relevant parties (e.g., sub-suppliers/subcontractors)?

11.4 Special considerations for future fuels

- Have vendors been involved early in the design process?
- Have suppliers and service providers been adequately consulted in resolving emerging problems associated with adopting new technologies?

12. Principle 9: Conduct sufficient independent inspection/assurance

Independent inspection is at the heart of procurement quality assurance. Inspection planning (including timing, scope and resourcing) is therefore key to successful procurement outcomes.

For future fuels, inspection is particularly critical given the dynamic environment and the nature of the vendors involved.

12.1 Default practices

1. Systematically identify critical procurement items and services and set appropriate quality and inspection requirements.

2. Involve technical personnel in site inspections to ensure specification requirements are met.

12.2 Key considerations – Purchasers

- Do we have sufficient control mechanisms at the interfaces that are critical to quality assurance?
- How would we know if a supplier or sub-supplier were providing fraudulent or counterfeit materials?
- Are we sure that the inspectors we are using will act independently and tell us about any issues identified?
- Do we actively address quality issues, or do we assume that relying on using suppliers with ISO quality accreditation is sufficient?
- Do we have adequate processes/plans to act upon issues identified in a timely manner?
- Do we have sufficient oversight of work quality by sub-suppliers (e.g., steel manufacturers) and subcontractor performance?

12.3 Key considerations – Suppliers/Service providers

- Can the sub-suppliers/subcontractors meet criteria required by the prequalification process?
- Have overseas manufacturers been early engaged to understand requirements?
- Have compliance issues been considered, especially with overseas manufacturers? Have we had adequate supervision and audit mechanisms for compliance?
- Are third-party inspectors independent from vendors? Have we done sufficient onsite inspections at overseas manufacturers?
- Have we done additional checks early enough?

12.4 Special considerations for future fuels

- Have we clearly specified requirements for testing and certification of new technologies?
- Who are the independent inspectors, and do they have the required skills for new and emerging technologies?
- Have we considered redundancy in layers of inspection in case one strategy fails because of a lack of experience with future fuels?

13. Principle 10: Ensure changes are adequately managed

Any procurement activity will likely involve some revisions to scope and specifications as requirements change. It is important to ensure that changes are made for the right reasons and that all impacted parties are aware of current requirements.

Given the dynamic nature of future fuels technologies, procurement is likely to be subject to even more change than usual, so change management is particularly critical.

13.1 Default practices

Ensure that any technical changes to approved design drawings and specifications are checked by those with appropriate technical knowledge and communicated to suppliers/service providers in a timely manner.

13.2 Key considerations – Purchasers

- Is there a system for managing and communicating changes to approved drawings and specifications? Is it fit for purpose and working well?
- Is there a system to ensure that all stakeholders that are likely affected by a change are informed of the change?
- Are relevant stakeholders involved in assessing the impact of the change and consulted in decision making?
- Are we aware of the risks, complexity and level of controls required for adopting fast track, i.e., commencing construction or fabrication before the design is finalised?

13.3 Key considerations – Suppliers/Service providers

- Have we received complete design information?
- Are we aware of any deviations from the original specifications/design?
- Has advice been provided to ensure what has been modified will be fit for purpose?
- Have we communicated any design changes to sub-suppliers/subcontractors in a timely manner?
- Have we considered all possible impacts (schedule, cost, quality, safety, etc.) of the modifications and communicated them to the client?

13.4 Special considerations for future fuels

- Are changes required to keep up with current research captured and managed by our change management system?
- Have we sufficiently discussed the changes needed in design, manufacturing, construction and operation to accommodate new technologies and communicated them throughout the supply chain?
- Have we reviewed and revisited the assumptions in procurement planning to reflect the technical changes in the transition to future fuels?

14. Principle 11: Consider logistics early and set up adequate logistics arrangements

Global supply chains and remote field sites mean that the logistics of getting purchased items to site without damage and in a timely manner present a significant challenge. The potential for disruption has only increased in parallel with the increase in geopolitical conflicts and severe environmental events. Early identification and consideration of likely logistics issues are increasingly necessary for procurement success.

These considerations apply equally to future fuels procurement.

14.1 Default practices

1. Clearly specify logistics requirements and responsibilities in procurement contracts.

2. Establish monitoring mechanisms to ensure logistics requirements and responsibilities are met.

14.2 Key considerations – Purchasers

- Do we understand our biggest logistics risks? Have we considered external sources of disruption?
- Are there logistics risks beyond our experience? Where can we get help to manage them?
- Have we considered the impact of logistical interdependencies?
- Is responsibility for custody transfer clear for stakeholders at every stage?
- Do we understand customs clearance, duty and tax obligations at every stage?

14.3 Key considerations – Suppliers/Service providers

- Have we considered all possible logistics risks that are within our responsibility and put sufficient arrangements in place to minimise them?
- Are custody transfer requirements clear, especially specific handover points in the contract terms?
- Are inspection plans in place to ensure that the condition of goods is known at all handover points?

14.4 Special considerations for future fuels

- How do we adapt international experience on logistics for future fuels into the Australian context?
- Are there new considerations for packing and transporting products and equipment for future fuels projects?
- Are there any emerging logistical interdependencies in procurement for future fuels? How do we plan for them?

15. Principle 12: Close out procurement mindfully

There is always a temptation to move on quickly to the next project, but it is important for improving procurement outcomes to ensure that procurement activities are closed out mindfully, i.e., with consideration of lessons to be learned from the procurement exercise and effective handover of the procured facilities.

Any experience in future fuels procurement will provide valuable lessons for future projects.

15.1 Default practices

1. Document, exchange and record lessons on successes and failures for future procurement.

2. Provide relevant documentation and training to Operations/Maintenance and other relevant parties.

15.2 Key considerations – Purchasers

- Have we both sought and provided feedback on opportunities for improvement both internally and between organisations?
- Are there procurement lessons that we should communicate across our wider industry?
- Has all as-built information been collected and incorporated?
- Has all relevant vendor data been made available to Operations/Maintenance?
- Has all relevant training been organised/delivered?

15.3 Key considerations – Suppliers/Service providers

- Have we shared lessons learned with and sought feedback from the client at the end of the work/service?
- Have we identified and recorded all issues to improve future services?
- Have we involved sub-suppliers/subcontractors in seeking lessons and learning for future improvement?

15.4 Special considerations for future fuels

- Have we considered small trials of new procurement practices to integrate the feedback and lessons learned into major transformations to future fuels?

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