Project Governance in a Project with Integral Contracted Engineering Services

A. (Anouk) van Daatselaar BSc. – s1727176

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Abstract

Integral contracted engineering services (ICES) is, at the time of writing, a new concept in the construction industry. A new concept brings a lot of unknowns. One of these unknowns is how the project governance, meaning the formal design and control of a project, should be optimally designed. In the case study, as discussed in this research, still some unclarities and inefficiencies remain in the project governance. By conducting interviews with key persons, obstructing issues for the project governance could be uncovered. For the found obstructing issues, possible solutions are proposed with the help of brainstorm sessions. It is concluded that some aspects need attention when working with ICES. The first main point of attention is the procurement method. For the case study, Best Value was used. It was noted that Best Value limits flexibility. The procurement method should be selected with care, to fit the principles of ICES. Concerning project management, issues came forward regarding team composition and communication with the client organisation. In the case study, inefficiencies were noticed in the communication in the team and with the client organisation. When selecting a project management approach, the workings of ICES should be taken into account to achieve fluent and clear communication. At last, this research shows that at the start of the case study project not all people were suitable to work with ICES. Selecting people on their competencies benefits the success of a project with ICES.

Integrale uitbesteding van diensten (ICES) is, op het moment van schrijven, een nieuw concept in de bouwsector. Een nieuw concept brengt echter veel onduidelijkheden met zich mee. Eén van die onduidelijkheden is hoe de project governance optimaal kan worden vormgegeven. De project governance omvat de formele opzet en beheersing van een project. In de casestudy, die besproken wordt in dit onderzoek, werden een aantal onduidelijkheden en inefficiënties rondom de project governance waargenomen. Door middel van interviews met sleutelpersonen zijn belemmerende kwesties met betrekking tot de project governance aan het licht gebracht. Met behulp van brainstormsessies zijn mogelijke oplossingsrichtingen bedacht voor deze belemmerende kwesties. Geconcludeerd kan worden dat sommige aspecten aandacht behoeven wanneer er met ICES wordt gewerkt. Het eerste aandachtspunt is de wijze van aanbesteden. Voor de casestudy werd gebruik gemaakt van Best Value. Opgemerkt werd dat Best Value de flexibiliteit beperkt. De aanbestedingsmethode moet met zorg worden gekozen, zodat deze past bij de beginselen van ICES. Wat het projectmanagement betreft, kwamen kwesties naar voren met betrekking tot de teamsamenstelling en de communicatie met de organisatie van de opdrachtgever. Ook werden inefficiënties opgemerkt in de communicatie in het team en met de OG-organisatie. Bij de keuze van een projectmanagementaanpak moet daarom rekening worden gehouden met de werking van ICES om tot een vlotte en duidelijke communicatie te komen. Ten slotte kwam in de casestudy naar voren dat aan het begin van het project niet alle mensen geschikt waren om met ICES te werken. Het selecteren van mensen op hun competenties zou het succes van een project met ICES ten goede doen.

1 Introduction

Integral contracted engineering services (ICES) is a relatively new concept in the construction industry. When using ICES, a delegated client (DC), often an engineering or consultancy firm, is recruited to fulfil the operational tasks of the client. The DC is involved in multiple phases of several disciplines and is involved earlier in the process compared to other outsourcing methods.

ICES can be used when the client has a limited capacity in staff and wants to employ an engineering or consultancy firm to take over the work of the client integrally.

Since ICES is not often used yet, not much is known about working with ICES. One of the uncertainties concerns the project governance. It is unknown how the project governance should be structured optimally

for a project with ICES. Therefore, this research was conducted. In this paper, recommendations are provided to improve the formation of the project governance for a project with ICES.

To come to these recommendations, a case study was used. In the Netherlands, the largest public client Rijkswaterstaat (RWS) faced the problem of a large demand for projects that need to be executed and a limited available capacity of their own staff. Therefore, started RWS a pilot with ICES. The DC selected for this pilot is the engineering firm Royal HaskoningDHV (RHDHV).

In this introduction, some background information is given. This is followed by the problem description and research goal and question. Next, the method and scope of this research are described.

1.1 Background

The background information consists of three parts. First, the pilot project 'Overnachtingshaven Spijk' (OH Spijk) is illustrated. Next, the working of ICES is explained. This chapter is concluded with an elaboration of previous research conducted for the project OH Spijk in relation to ICES.

1.1.1 Project description

It is normal practice for RWS to outsource tasks to engineering or consultancy firms. However, RWS wants to do more work with fewer of their own people. It is assumed that this can be done with an integral procurement of the services of a DC.

To test this hypothesis, RWS started a pilot with ICES at the project OH Spijk. This project concerns the construction of an overnight mooring near Spijk, which is constructed due to a shortage of overnight moorings for ships between the German border and Tiel. The location of the mooring can be found in Figure 1. (Rijkswaterstaat, n.d.-b)

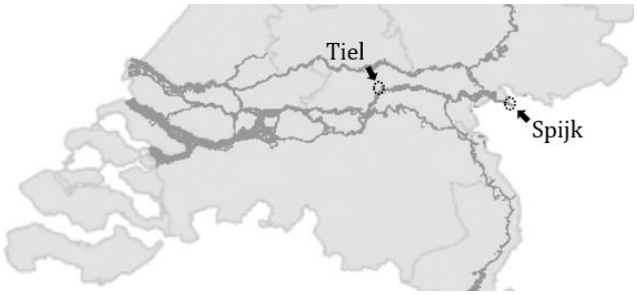

Figure 1 Location Spijk and Tiel

The services contract is tendered with the use of Best Value. This is a procurement method as well as a way of working. When using this approach, the vendor, in this case the DC (RHDHV), is in the lead. The vendor is seen as the expert. The client (RWS) minimizes direction and releases control.

1.1.2 Integral contracted engineering services (ICES)

During the integral contracting of engineering services, a DC is integrally involved in multiple phases and involved in all the disciplines present. In the case of the pilot at OH Spijk, the DC is involved in the contract preparation and tendering of the contractor. In addition, the DC will oversee the realisation and ultimately hand over the final product to the operators. The DC will not construct the project but will take over the operational tasks of the client.

A different composition of parties also results in a different organisational structure. Three parties have a place in the organisation: the client, the DC, and the contractor for the realisation. Integral Project Management (IPM) is used to ensure that the collaboration runs smoothly. For OH Spijk, all three parties make use of IPM, where all IPM roles are mirrored. When using IPM, the process is divided into five parts, with associated key roles. All three parties have these five key roles: Project Manager (PM), Contract Manager (CM), Manager Project Control (MPC), Environment Manager (EM), and Technical Manager (TM). The structure is visualised in Figure 2. In addition, there are some advisory roles such as the Best Value Advisor.

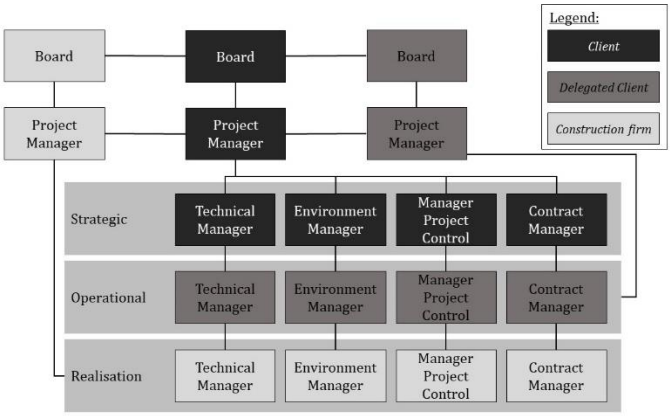

Figure 2 Organisational structure (Based on: Rijkswaterstaat, 2019b)

1.1.3 Previous research

Regarding the pilot for the project OH Spijk, some research is already performed. This research also concerned the project governance. Project governance provides a framework for ethical decision-making and managerial action within a project organisation. More straightforward, it concerns how a project is formally designed and controlled. Important is that the organisation is based on transparency, accountability, and defined roles. (Too & Weaver, 2014; Volker & Hoezen, 2017)

Verhoeven (2020) describes in his research about the project governance of project OH Spijk that some

inefficiencies could be noticed in the team composition and the decision-making process. Next to this, some unclarities came forward concerning communication between the involved parties.

To resolve these issues, a more flexible approach was proposed. The original situation, as illustrated on the left side of Figure 3, describes a 'hard border' of the scope between the client and the engineering firm (in this report described as DC). This hard border indicates that the tasks and way of communicating are clear and comes with less squandering as possible. However, moving to the situation on the right side of Figure 3, more integration between the client and DC will occur. In this situation, the borders of the scope are loosened and more interaction between the two parties could occur. The loose scope border could also facilitate collaborative decision-making and sharing of risks and rewards. (Verhoeven, 2020)

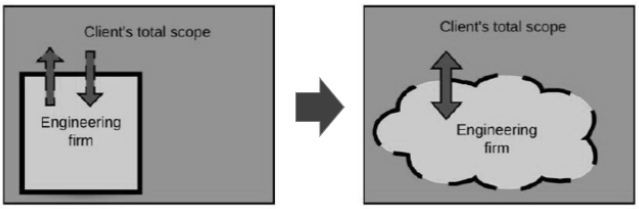

Figure 3 Change in structure as recommended by Verhoeven (2020)

1.2 Problem description

ICES is a relatively new way of outsourcing work, which results in various uncertainties. One of these uncertainties is regarding the project governance. It is not known how the project governance should be optimally designed when working with ICES.

For the case study OH Spijk is perceived that the project governance is not optimal when using ICES. Some unclarities and inefficiencies are noticed concerning the project governance. However, it is not known yet how these unclarities and inefficiencies could be reduced.

1.3 Research goal and questions

As can be seen in the problem description, a research gap is present concerning the project governance at a project with ICES. At the case study project OH Spijk, some issues could be noticed concerning the project governance.

The goal of this research is to provide insight in the project governance for a project with ICES and to reduce the unclarities and inefficiencies. This goal leads to the research question: *How to govern a project with integral contracted engineering services?*

The research is mainly about the formation of the project governance, but to obtain more in-depth knowledge of this topic, also the decision-making is researched.

To answer the research question, supporting literature is first presented. Secondly, a description of the formation of the project governance of OH Spijk is given and an inventory of unclear or inefficient aspects, so called obstructing issues, is made. The description and the inventory are divided into three separate parts: 1) procurement and commitment, 2) project management, and 3) competencies. At last, the obstructing issues that surfaced in the previous parts are addressed and possible solutions are proposed.

1.4 Method

After the literature and document study, the results were largely gathered via conducting interviews. Eleven key persons in the project OH Spijk have been interviewed. The interviews were semi-structured. A predetermined set of interview questions was used. However, there was room for the interviewees to elaborate on their insights. Findings from these interviews were later used as input for the brainstorm sessions. In those sessions, the found issues that obstruct the formation of the project governance and the decision-making were presented. The participants were asked to brainstorm about solutions to overcome these obstructing issues. The research was concluded with two interviews with the portfolio manager of RWS and the project director of RHDHV to validate the recommendations.

1.5 Scope

The research is largely focused on the pilot with ICES at the project OH Spijk. The focus is on the project governance which involves the client and the DC. For the interviews, only persons from RWS and RHDHV are involved.

The contractor who realises the project is not involved in the research for two reasons. The contractor was excluded because the contractor just started at the project when the research was conducted and had therefore limited experience with the project. Secondly, the focus of this research is on the relation between the client and the DC.

2 Theoretical framework

This chapter consists of five parts. First, an elaboration on project governance is given, including how it is formed and how one can learn from it. This is followed by a section about Best Value, which is used for OH Spijk. This part concerns the working principles of Best Value procurement and the importance of relationships. The next section concerns how

responsibilities can be assigned. The fourth part of this chapter is about risk allocation. Last, an explanation of a project management situation is given.

2.1 Project governance

As described before, project governance concerns the formal design and control of a project. Project governance consists of frameworks, models or structures that establish the process of project decision-making. It is recognised as a critical success factor for the delivery of projects. Good governance facilitates effective and efficient decision-making. This is described as "the right people making optimal decisions, that meet the needs of the project and its stakeholders". This includes making those decisions promptly. (Garland, 2009; Volker & Hoezen, 2017)

Volker & Hoezen (2017) describe, as displayed in Figure 4, that project governance is linked to procurement and commitment. From the procurement procedures and interactions follows commitments like legal contracts and informal psychological contracts, which leads to project governance. The project governance consists of three parts: structure, people, and information. From the project governance a learning loop can be created. Lessons can be learned from the project governance for future procurement.

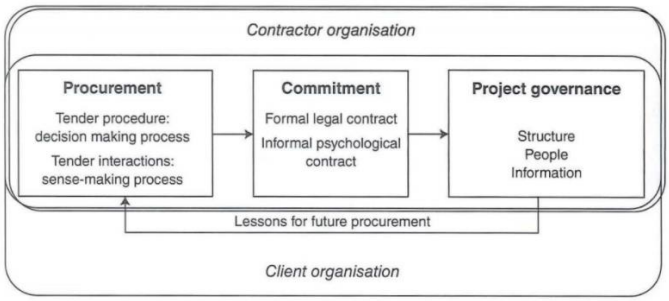

Figure 4 Learning from project procurement and project governance through commitment (Volker & Hoezen, 2017)

As stated before, by Volker & Hoezen (2017), the project governance can be derived from commitment and procurement (Figure 4). Ways the commitments are defined are for example through responsibility distribution and risk allocation. Another influence on the project governance, is the procurement method. In the case of project OH Spijk, the Best Value approach is used.

2.2 Best Value

The goal of Best Value procurement method is to get the best value for the lowest costs. However, Best Value is not only a procurement method, but also a way of working. When using Best Value, the vendor is in the lead, because the vendor is seen as the expert. The client minimizes direction and releases control. This results in the vendor being accountable for the project.

The Best Value approach consists of four phases: The preparation phase, the selection phase, the clarification phase, and the execution phase.

In the preparation phase, the client prepares the purchasing process. The project goal and quality criteria are defined.

For the selection phase, the plans of the potential vendors are inspected. Two key officials will be interviewed. In addition, the plans are tested against various criteria. The input from the criteria is assessed and weighted. Based on the result of the interviews and the criteria, the client makes a (provisional) choice of the vendor.

The selected vendor continues to the clarification phase. In this phase, the basis for the realisation of the project or assignment is developed and is, therefore, considered as the most important phase. In this phase, the selected vendor is asked to clarify their approach in more detail. The vendor should present for example a scope of the project, a detailed project schedule, a list of risks, a risk management plan, a milestone schedule, and a method for the weekly risk report. If the delivered input is compliance with the contract demands and is accepted by the client, the contract is awarded officially to the vendor. If not, the next vendor on the list from the selection phase is asked to present their clarification.

The fourth phase is the realisation of the project. During this phase, the service or deliverable is delivered. Weekly risk and director's reports give the client insight into the risk management in de Best Value approach. The reports are produced to enhance transparency, to communicate information quickly, to assign accountability, and to create a supply chain approach. (Rijkswaterstaat, n.d.-a; Snippert et al., 2015; Van de Rijt & Santema, 2012)

2.2.1 Best Value and relationships

The type of relationship the parties choose, is important for the success of the Best Value approach and the project itself. An overview is given in Figure 5. When both parties choose to use the agency theory, a true principal-agent relationship is developed. This relationship is more of a price-based approach and is the opposite of the Best Value approach. Another option is that parties choose a different theory. This could result in frustration and one of the parties feeling betrayed. Concluding, both parties should use the stewardship theory for the success of the Best Value approach. (Snippert et al., 2015)

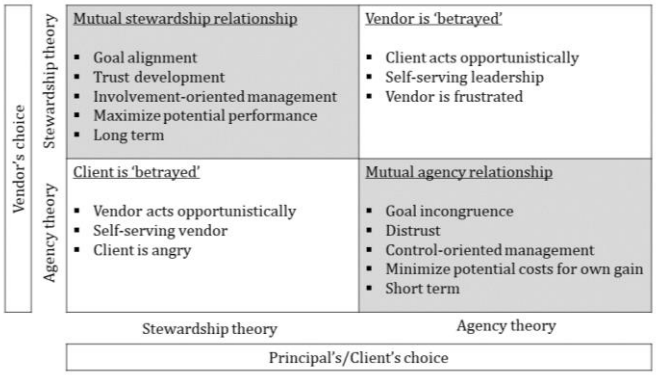

Figure 5 Typology of relations between the client and vendor (Based on: Snippert et al., 2015)

A stewardship relation should be formed to achieve cooperation. In this relation, the vendor focuses on fulfilling the purpose and objectives of the project, while the principal creates a situation that empowers the vendor. The stewardship relation is the kind of relationship that the Best Value approach tries to establish. (Snippert et al., 2015)

2.3 Responsibility

An important aspect of a project is that it satisfies to a predetermined time, budget, and quality level. To ensure this, it must be constantly monitored. In order to monitor successfully, there needs to be a predetermined accurate plan. An available tool to define and structure the plan, is a Work Breakdown Structure (WBS). A WBS is a hierarchical representation of the work content, gradually subdividing the project into smaller units. It is the basis for defining work packages. A schematic representation of a WBS is given in Figure 6. (Ibrahim et al., 2009; Winch, 2010)

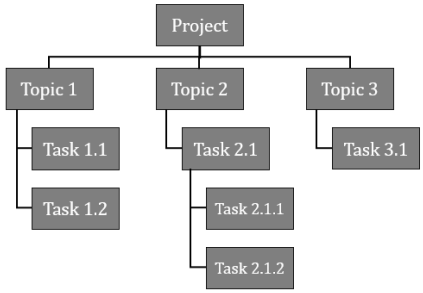

Figure 6 Schematic representation WBS

For successful execution and control of project planning, the WBS should be combined with the Organisational Breakdown Structure (OBS). The OBS is a hierarchical structure that describes the relationship between the parties and individuals involved. In the OBS the allocation of responsibilities for tasks is made. This is crucial for an effective project organisation. (Golany & Shtub, 2001; Winch, 2010)

Combining the WBS and the OBS can help to define responsibilities, authority, and accountability. This is done using responsibility charting. The responsibility chart consists of an X-axis, a Y-axis and a system of symbols identifying different types of responsibility for a specified task. On the X-axis are the involved parties and individuals from the OBS displayed. On the Y-axis the tasks to be executed which can be derived from the WBS are displayed. The symbols used can be adapted to the precise requirements. The symbol system used by RWS is RASCI, where the R stands for Responsible, the A for Accountable, the S for Support, the C for Consulted and the I for Informed. A visualisation of a RASCI is given in Figure 7. (Rijkswaterstaat, 2019a; Winch, 2010)

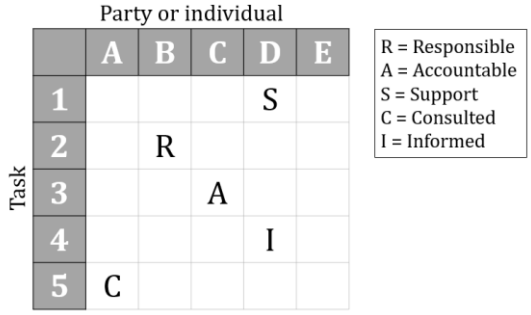

Figure 7 Example RASCI

2.4 Risk allocation

The identification and management of risk is an important aspect for the construction industry, as is the case for nearly all commercial organisations. When the risks are not managed carefully, severe consequences could occur. (Mead, 2007)

Ward et al. (1991) and Mead (2007) describe "the Abrahamson principles" of construction lawyer Max Abrahamson. These principles describe when a party should bear a risk:

- The risk is within the party's control;
- The party can transfer the risk, for example through insurance, and it is most economically beneficial to deal with the risk in this fashion;
- The preponderant economic benefit of controlling the risk lies with the party in question;
- To place the risk upon the party in question is in the interest of efficiency, including planning, incentive, and innovation efficiency;
- If the risk eventuates, the loss falls on that party in the first instance and it is not practicable, or there is no reason under the above principles, to cause expense and uncertainty by attempting to transfer the loss to another.

However, these principles are not always used in practice. A study of major construction contracts

found that the risks were not always allocated to the party which would be best able to manage the risk. Furthermore, risks that were not possible to manage by consultants or contractors were still transferred to them. Next to this, the implications of changing risk allocation were not known, and the number of disputes and claims increased as a consequence of changes in the risk allocation. (Mead, 2007)

2.5 The Best Value farm: responsibility and risks

To describe the responsibilities and risks following the Best Value approach, a farm is used as an example. When using the Best Value approach, the vendor is responsible for the farm and everything that needs to be done on the farm. The border of the farm describes the in-and-out-of-scope list. Everything on the farm is the responsibility of the vendor and everything on the outside that of the client. The same goes for the risks. When a risk occurs inside the farm, say the pigs eat by accident all the crops, it is seen as a technical error and the consequences are for the vendor. If a risk from outside occurs, for example a wolf attack, there are three options: 1) the client can deal with the risk (by placing traps) themselves, 2) both parties can work together to solve the problem, or 3) the client can enlarge the scope of the vendor and pay them for the extra work. These three options are visualised in Figure 8. When a risk is not anticipated and the scope needs to be enlarged, it is called a request for amendment (Dutch: Verzoek tot Wijziging, VtW). (Personal communication, 27-01-2021)

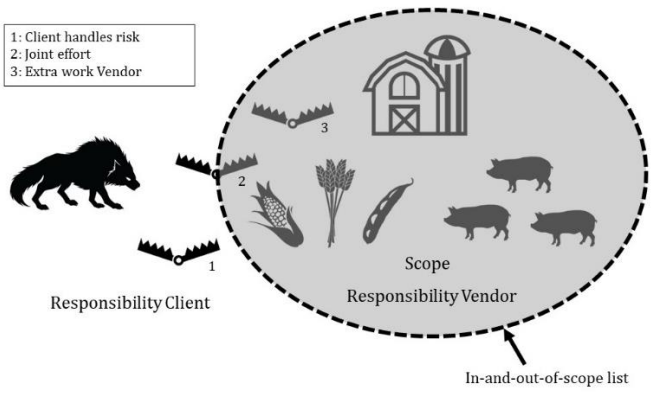

Figure 8 The Best Value farm

2.6 Project Sponsor

For effective project management an agreement is needed between the client organisation and the project manager about objectives and goals. The alignment of goals and objectives impacts the support of the client organisation. To make this process run smoothly a Project Sponsor could be involved. (Too & Weaver, 2014)

The Project Sponsor is the interface between the project organisation and the client organisation. The Project Sponsor is part of the organisation of the client and is the liaison between the project manager of the project organisation and the people moving up in the organisation of the client. The contracted party, responsible for the delivery of the project or product, does not need to appoint a Project Sponsor, because the relationship between the client and the contracted party is defined in the contract. For the client organisation, it is an added value to appoint a Project Sponsor who is responsible for the interface of the client organisation with the contracted party. A schematic representation of the project management situations is given in Figure 9. (Crawford & Brett, 2001; Winch, 2010)

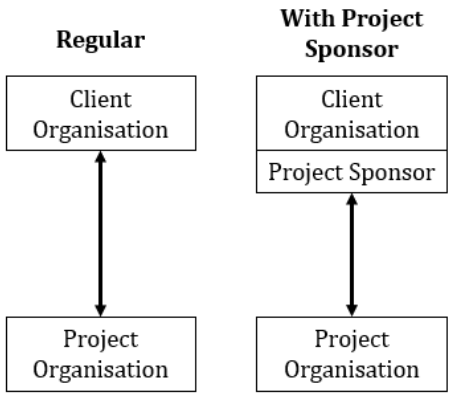

Figure 9 Different project management situations

The responsibilities of the Project Sponsor are:

- Represent interest client;
- Act as advocate of the project;
- Checking the progress of the project;
- Involvement in procurement and allocation of resources;
- Budget control and assisting in securing additional resources;
- Approving plans and changes;
- Making or guiding decision outside the scope of project organisation;
- Guiding project organisation with corporate policy client;
- Final delivery of the project.

These responsibilities should be clearly defined, because in situations without a Project Sponsor many of these responsibilities belong to the project manager. (Crawford & Brett, 2001; Too & Weaver, 2014)

To fulfil the role of Project Sponsor successfully, some competencies are desired. From the project organisation point of view, the Project Sponsor should have appropriate seniority, power, and knowledge of the organisation to get the issues on the right level of the organisation. The Project Sponsor should be

willing to make connections between the project and the organisation and be compatible with other key players. Also, courage and willingness to battle on behalf of the project are needed. From the client's point of view, the Project Sponsor should have an integrative business perspective and should be able to evaluate complex systems from multiple perspectives. (Helm & Remington, 2005)

3 Findings

In this chapter, the findings from the interviews are elaborated. The findings consist of an elaboration of the current situation and of a description of obstructing issues concerning clarity and efficiency.

The results are divided in three parts. The first part concerns procurement and commitment, followed by the project management and the third part is about competencies.

3.1 Procurement and Commitment

In this chapter, three topics are described. The first topic is Best Value, the procurement method used at OH Spijk. The second part is about responsibility and the topic of the last part is risk allocation.

3.1.1 Best Value

As described by Snippert et al. (2015), the client and the DC should use the stewardship theory to be able to successfully apply the Best Value approach. This means that there should be goal alignment and trust between the parties.

The interviewees agreed that for goal alignment, common goals should be created. Nevertheless, individual goals are allowed, but they should be known by the opposite party and should not harm the other party or the common goal. Before starting a project, the goals and interests should be made clear to another. This could be done in the pre-contractual phase. Important is that this dialogue is continued throughout the complete project timeline.

Several aspects influence trust. Trust will grow when the common goal and the role division are clear. It also helps if responsibilities and intentions are discussed explicitly and when there is transparency. It prevents bypassing each other. The relationship should stay clean by informal talks and frequent evaluations. In addition, personal commitment helps with building trust. Next to this, the right expertise should be present. This means, that the right person is in the right position and high-quality work can be delivered.

Currently, the level of trust between the DC and the client's IPM team is high. However, moving up in the client organisation the levels of trust are lower. The goal alignment between the DC and the client's IPM team is sufficient. In the pre-contractual phases, the goals are aligned, and the goals are subject to discussion at performance evaluation moments. So, it could be concluded that the DC and the client's IPM team have formed a stewardship relationship, which is beneficial for the success of the Best Value approach. However, moving up in the client organisation there is room for improvement, mainly in the level of trust.

Best Value and decision-making

The interviewees described that one of the aspects of Best Value is that there should be looked into the future. Looking into the future makes clear which path is taken. If known which path is taken, there is theoretically no decision needed, because everything is predictable. This predictability also ensures that decisions do not suddenly emerge.

However, in reality, decisions still need to be made. Best Value indicates that the DC should present a transparent and structured plan to the client. This plan should convince the client. This goal can be achieved with clear, unambiguous, and explainable information, so called dominant information. If advice consists of dominant information, the client will be more eager to accept and implement the advice. Besides the dominant information, trust can also play a role in the acceptance of an advice.

Inside the project team of OH Spijk, the Best Value principles are implemented, and the DC is in the lead. Nevertheless, when a decision needs to be made higher in the client organisation, the implementation of the Best Value principles is considered to be incorrect. The client organisation does not let the DC in the lead and shows too much expertise. Next to this, there are low levels of transparency and trust.

3.1.2 Responsibility

The client's IPM team and the client organisation at OH Spijk are responsible for the so called 3Bs: Beheersen, Beslissen, and Betalen (Control, Decision-making, and Finance). Almost all operational tasks are the responsibility of the DC. The DC needs to take the lead and only needs the client for a decision or a payment. However, the client's IPM team should not only lean back, but keep overview and react when an issue arises. There is a need for transparency from both sides, clarity around the advice, the quality of the work and the risks.

Work Breakdown Structure

Looking at the WBS it could be noticed that the WBS has a higher abstraction level than in a project without ICES. There is no exact list of products that need to be delivered. Instead, only an indication of the process

steps is created. Another aspect of the ICES is the involvement of the DC in multiple phases. Therefore, one WBS needs to facilitate all those phases instead of several separated WBSs. The interfaces of the phases are now the responsibility of the DC. However, some elements of the WBS are still in the domain of the client's IPM team. In the interfaces between the elements of the client's IPM team and elements of the DC, miscommunications could occur. These borders are not always clearly defined. Next to this, some activities of the client's IPM team could be inside an WBS element of the DC and vice versa. Extra tuning is needed for these interfaces.

Responsibility chart

As mentioned by Winch (2010) a responsibility chart, also called RASCI, could describe the responsibilities clearly. However, for a project with ICES, it could have too many details. A more abstract approach for the WBS is used on purpose to leave room for craftmanship of the DC. For a project with ICES, it is not desirable that the content and distribution of responsibilities is already pinned down. Therefore, a RASCI is considered to be not useful for this situation.

Responsibility and decision-making

As mentioned before, the client organisation and client's IPM team are responsible for the decision-making. The DC is only allowed to make decisions inside their scope. However, for decision-making, it is not always clear where the scope ends. The DC could cross this line and makes a decision in the domain of the client. However, the consequences of these decisions are still for the client. Logically, that situation is not favourable.

In practice, the DC itself does not make many decisions. Instead, the DC is mainly responsible for giving advice with a convincing argumentation.

3.1.3 Risk allocation

The risk allocation is based on the in-and-out-of-scope list, as described in chapter 2.5. It depicts the responsibilities and with the list, the risks can be allocated. In the case of ICES, more responsibilities are for the DC. This means not only the extra work but also the interfaces between disciplines are in the domain of the DC. The result is that the DC bears more risks compared to a situation without ICES.

The DC is responsible for the risks that occur in its scope. When the DC makes a technical error, they must pay for the consequences. The risks that are outside the scope of the DC, such as the tasks of the client or external risks, are the responsibility of the client. However, it is expected that the DC deals with all risks pro-actively. If the DC identifies a risk, they should act by informing the client's IPM team.

By introducing ICES, a new type of relation between the client and the DC is formed, which introduces new risks. The extra layer in the client organisation could result in extra risks. For example, the extra communication step could cause extra risks. When an issue arises during the realisation there is an extra communication step before the issue is known by the client. This could elongate the response time.

Risk allocation and decision-making

The client makes a decision based on the advice of the DC. However, when the client takes the decision, the client is responsible for the risks and consequences resulting from the decision. Even when the advice was not sufficient, but the decision has been made, the DC bears no responsibility.

In addition, the consequences of a decision are often not clearly presented. Before the decision is made, the risks are often not described and distributed in detail. Also, after the decision is made, the consequences of this decision are not always described.

3.2 Project management

This chapter explains project management in three sections. The first part is about the Project Sponsor, which describes an alternative project management approach. This is followed by a part about the team. Last the communication with the client organisation is discussed.

3.2.1 Project Sponsor

As described in 2.6, a Project Sponsor can be added to the project management situation as contact person between the client and the project organisation. The description of the Project Sponsor has many similarities with the tasks of the IPM team of the client. All responsibilities of the Project Sponsor as described in chapter 2.6 are also the responsibility of the client's IPM team. However, the IPM team of the client has still some extra (operational) responsibilities. Therefore, the client's IPM team cannot completely be considered as the Project Sponsor. However, when taking ICES a step further and outsourcing the remaining tasks of the client's IPM team to the DC, the IPM team of the client could be described as a true Project Sponsor. The DC will then form the project organisation. A schematic representation of this project management situation is given in Figure 10. Nevertheless, the client organisation should always have a contract manager to oversee the contract of the DC. This could be a task of the Project Sponsor or a separate role.

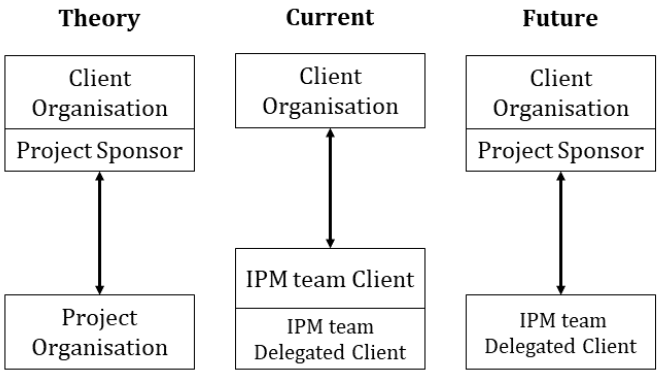

Figure 10 Possible project management situation

3.2.2 Team

As described in chapter 1.1.2, the client's IPM team and the DC's IPM team are mirrored. These double roles cause extra work and more communication lines, which are subject to noise. For example, the communication between the DC and the contractor responsible for the realisation needs to be repeated with the client. This extra communication step is extra work and can result in miscommunication.

The IPM team of the client is not always perceived as useful on a substantive level, they are only seen as a gateway to the rest of the client organisation. If the IPM team of the client only functions as a gateway, there is a fear for the loss of substantive knowledge in the client's IPM team. However, when the client's IPM team is only a gateway, it can be debated if substantive knowledge is even needed for this position.

3.2.3 Communication with client

It often occurs that a decision needs to be made moving up in the client organisation. The client's IPM team is responsible for communication with the different layers of the organisation. At which layer the decision needs to be made is often related to the financial impact of the decision. However, it is not always clear to DC and sometimes the complete project team how the client organisation is organised and who is responsible for the decision. The complexity of the client organisation causes ambiguities.

Next to this, the organisation is seen as bureaucratic. For one decision, multiple layers need to give an opinion. This is experienced as inefficient. Besides, some resistance from the client organisation concerning the pilot is perceived. Members of the client organisation involved in the decision-making process react adversely concerning the pilot.

3.3 Competencies

At the start of the project OH Spijk, not all key roles were not fulfilled by the right people. For the success of a project with ICES, some competencies are considered to be required. In chapter 2.6 already some competencies of the Project Sponsor are described. These competencies should also be applied to the client's IPM team.

In this part, some extra competencies for the client's IPM team and the desired competencies of the DC are described. Ten competencies are described and listed in Table 1.

One of the main competencies for a project with ICES is that the client's IPM team should be able to let go. They need to be able to **delegate** and not keep doing work themselves. However, they need to **stay informed**. The client's IPM team needs to perceive which risks play a role and **express concerns**. To be able to do this, the client's IPM team should have **substantial knowledge** and experience. That makes it easier for the client's IPM team to gather and comprehend information.

Both parties should be able to lean back and **look** at the project **from a distance**. They also need to be able to **work together**, even when things do not go as planned. **Ownership** is also a competency both parties should show because they should take responsibility for their work.

For the DC, it is important to grab the responsibility and not fall back in their usual advisory role. Giving advice is important for decision-making moving up in the client organisation, but in daily work, the DC should **take control**.

For a project with ICES, the persons from the DC should be able to **work integral**. They should be able to look outside of their discipline and to anticipate on the other disciplines. There is also a need for **strategic and tactical thinking**. It is not only operational work for the DC but also counselling for the strategic and tactical work of the client's IPM team.

Table 1 Competencies

Client's IPM team	Delegated client (DC)	Both parties
▪ Delegate ▪ Keep informed ▪ Express concerns ▪ Knowledge	▪ Take control ▪ Working integral ▪ Strategic and tactical thinking	▪ Look from distance ▪ Work together ▪ Ownership

4 Solution space

From the previous chapters, some obstructing issues for the formation of the project governance and the decision-making process could be derived. In this chapter, these obstructing issues are compiled, and possible solutions are proposed. To limit the scope, only obstructing issues that could be influenced by the DC or the client's IPM team are considered. Issues that only can be solved by the client organisation are excluded from the scope. The obstructing issues are divided into three parts: procurement and commitment, project management, and competencies.

4.1 Procurement and Commitment

In this chapter obstructing issues concerning procurement and commitment are discussed and possible solutions are presented. The topics where obstructing issues came forward were responsibility and risk allocation.

4.1.1 Responsibility

There are some unclarities in the WBS. The interfaces between the responsibilities of the DC and the client are not always clear. In addition, responsibilities of the client could be in a WBS element of the DC and vice versa. To resolve this issue, more clarity is needed concerning the interfaces.

One way to create clarity is to make more agreements at the start of the project. There are four possible ways listed:

- An in-or-out-of-scope list could also be created for the client, currently this is only done for the DC;
- The dependencies of the WBS elements could be listed;
- The needed input for the WBS elements and the expectations could be described;
- Process schemes or flowcharts could be created to indicate when someone needs to act.

Another way to deal with the unclarity in the interfaces of the WBS, is to show pro-active behaviour. When something is needed from the other party, this should be made known in a timely manner to prevent surprises for the other party. But also, the other way around, by asking if the other party needs anything, the unclarity could also be reduced.

Flexibility is another type of behaviour that could increase the clarity in the WBS. Taking over tasks from another domain when needed, could simplify the process. Flexibility could also reduce the number of VtWs. However, for flexibility to work it should be embraced by both parties. One disadvantage could be that flexibility could cause some contractual issues.

The last way of increasing the clarity of the WBS is to appoint coordination, such as a manager who oversees the process and acts when there are unclarities.

Concerning the decision-making, it is not always clear when the DC is allowed to make a decision on their own or when the DC gives advice, and the client makes the decision. In practice, this does not often result in a problem. However, to prevent problems in the future, the types of decisions could be identified in advance. At the start of the project, a distinction could be made between different types of decisions. These types could be linked to responsibilities, required information, and the route in the client organisation.

4.1.2 Risk allocation

The DC is only responsible for risks in their scope, which are also described as technical errors. The client is responsible for the risks in their scope and the external risks. Concerning decision-making, all risks are in the domain of the client. However, the DC delivers advice for the decisions. Therefore, the question could be if the DC could bear more responsibility concerning risks.

The risk allocation can be changed through three parameters:

- Mandate, which describes what types of power a person or organisation has;
- Scope, which describes the boundaries of the assignment;
- Contract conditions, which describes the contractual boundaries.

According to the Best Value principles, it is not possible to allocate more risk to the DC. Best Value prescribes a small and defined scope. However, the Best Value principle helps with mitigating risk by presenting dominant information.

Allocating more risks to the DC could also be considered not favourable. The DC will need to raise the price to insure the risks.

An alternative option could be a "risk jar". In this jar, both client and DC put money. When a risk occurs, the consequences could be paid from this jar. The remaining money at the end of the project could be divided. This gives both client and DC the incentive to mitigate risks.

4.2 Project management

Obstructing issues concerning project management are divided into two subjects: team and communication with the client.

4.2.1 Team

Currently, the team is constructed of two mirrored IPM teams. The client and the DC have both a complete

IPM team as described in chapter 1.1.2. The mirrored teams result in an extra interface in the project organisation. This extra interface could cause inefficiency. Next to this, the mirrored teams can cause noise in the communication.

These issues can be reduced in multiple ways. This can be done by making large changes, however, there are also less drastic options to reduce the inefficiency and noise.

The drastic option is to dismantle the IPM team of the client partially. By removing some of the roles at the client's side, such as the MPC, EM and TM, the communication lines, and therefore some inefficiency and noise, can be reduced. The PM and CM are considered crucial for the client. The PM is the gateway to the organisation of the client, and the CM is considered crucial because the DC cannot manage their own contract. This option is a step closer to the Project Sponsor situation as described in chapter 2.6. However, removing roles from the client's IPM team could decrease the surveillance on the DC. For example, the TM of the client is responsible for checking the work of the TM of the DC. When the TM of the client's IPM team is removed from the team, no direct control is appointed. The monitoring of the work of the DC will become the responsibility of the PM.

There are also smaller changes that could be made to reduce noise and inefficiency. One of these options is the centralise the activities and progress. To have one platform that gives insight in where everyone is working on. This provides more transparency which could result in more efficiency and trust. Storing all documentation in one central place could also increase efficiency and reduce noise.

A clear role, work and responsibility distribution could also reduce noise and inefficiency. When people let go of tasks that are not their responsibility the number of communication lines can be reduced.

The next option is to involve the three parties in specific meetings. For example, involving the PM of the client in meetings with the contractor, or involving the DC in meetings moving up in the organisation of the client. It is also possible to organise additional meetings with all parties. Another addition could be to organise sessions where specific topics or situations will be discussed in detail, so that everyone involved in the project is informed about the status of that specific topic or situation.

Another way to reduce noise and inefficiency is to increase people-oriented and informal contact. The people involved should keep each other informed and there should be no surprises. Additional sessions could be organised when incidents occur to prevent or resolve frustrations.

Last, the roles should be fulfilled by the right person. The people working with ICES should have the competencies as described in chapter 3.3.

4.2.2 Communication with client

The client organisation of the case study (RWS) is a large public organisation. The size of the organisation and the rules and standards that a public organisation needs to meet, creates obstacles for the project team (IPM team client and DC). It is not always clear how things are arranged in the organisation and who is responsible for, for example, making a decision. For the project team, it is considered not possible to change anything in the organisation. However, the project team can find a way to deal with the unclarities.

To create more clarity, the project team could make a "stakeholder analysis" of the client organisation. Mapping the stakeholders with their function and mandate could provide more clarity. An addition could be to include the level of knowledge of the stakeholder and the level on which the stakeholder needs to be informed. With this stakeholder analysis, the stakeholders needed for a specific process could be inventoried in advance.

To reduce unnecessary efforts, the project team could just focus on what is known. Not determining multiple routes in the organisation upfront but just sticking to one route. If this route is not successful, then start looking for an alternative route in the client organisation. It is not often the case that the project team needs a route high in the organisation, so not often excessive efforts are needed to map the routes in the client organisation.

The unclarities could also be dealt with by appointing an expert, who is familiar with the client organisation and knows the routes and procedures in the organisation. This could be for example a Project Sponsor as described in chapter 2.6. However, expertise could also be utilized inside the project team, by finding and mobilising people with the right knowledge inside the project team.

Acceptance could also help with dealing with the unclarities. Acceptance about how the organisation is organised and that the project team does not have the influence to change the client organisation. Also, acceptance of the output could decrease the influence of unclarities, for example, a decision made by the client organisation.

4.3 Competencies

In the teams of the client and the DC, the roles are not always fulfilled by the right person. A mismatch

between the function and the competencies could cause inefficiencies. In addition, for a project with ICES, different competencies are needed compared to a project without ICES. To reduce inefficiency, the roles should be fulfilled by people with the right competencies. The competencies as described in chapter 3.3 could be a guide for selecting people for a project with ICES.

5 Discussion

The discussion consists of three parts. First, a discussion of the results is given. This is followed by a description of the validity of the research. At last, some limitations and possible further research are discussed.

5.1 Discussion of the results

During this research, advantages of the Best Value approach came forward. As already mentioned by Snippert et al. (2015), for the client, applying Best Value enables to minimize direction and to release control, which is one of the competencies needed for a project with ICES. Another benefit of Best Value is that it prescribes reducing the number of decisions by presenting dominant information.

However, it could be discussed if Best Value is the most suitable option for a project with ICES. Best Value prescribes that the DC should present a scope which they can control. However, it could be debated if this is favourable. The client wants to outsource a specific scope and not only what the DC thinks they can handle. Next to this, when the project is awarded to the DC the scope is set and strictly described. This reduces the possibility of flexibility and cooperation. More flexibility could be added value in the work distribution and risk allocation and could reduce the number of VtWs. Flexibility could be reached by using a more variable contract from which is less based on hours and more on the actual goals.

Verhoeven (2020) described already that a looser scope definition could be beneficial for the interaction between the client and the DC. In this research, also came forward that there is a demand for more flexibility. However, the hard scope border has also its benefits. There is even a demand for more definition of the scope. There are two directions changes that could be made: towards more flexibility or towards more definition. These contradictions could be found in the input from RWS and RHDHV, some participants even mentioned both: more definition and more flexibility. However, both options cannot be applied at the same time. It is possible to use a different approach for different parts. For example, where many changes may take place, flexibility would be appropriate. Where the process is more predictable, more definition could be an option.

Concerning the responsibilities, more contradictory results came forward. On one side the responsibilities could be defined in more detail. By making for example also an in-and-out-of-scope list for the client. On the other side, there is a demand for more flexibility.

Both options could be beneficial, however, it is not always favourable to have a high detail level. As mentioned by Winch (2010), a responsibility chart or a RASCI could provide more clarity about the allocation of responsibilities. However, the literature does not consider that a high level of detail is not always preferable. It reduces opportunities for the DC to use their own perceptions and ideas.

Comparing the risk allocation results with the literature on risk allocation some similarities can be found. The second principle of Abrahamson states that the party that can transfer the risk in the most economically beneficial way should bear the risk (Mead, 2007; Ward et al., 1991). As came forward, it would not be economically beneficial if the DC would bear the risks outside their scope. Therefore, the external risks should remain with the client. However, looking at the fourth principle of Abrahamson, placing risks upon the DC, could be in the interest of efficiency. Bearing the risks could be an incentive for the DC and could trigger innovation (Mead, 2007; Ward et al., 1991). However, Mead (2007) describes that transferring risks to consultants should be done with caution. The DC should be able to manage the risk and the implications of changing the risk allocation should be known.

Looking at the project management, there was a similarity noticed between the project management situation of a project with ICES and one with a Project Sponsor. However, still some differences remain. In a project with ICES, the IPM team of the client has still more responsibilities than a Project Sponsor. By moving more towards the Project Sponsor situation, some benefits can be achieved. By appointing a Project Sponsor instead of a complete IPM team, the communication lines can be reduced and therefore the noise and inefficiency could be decreased. Having a Project Sponsor could also ease the communication with the client organisation. By appointing a Project Sponsor that knows the way moving up in the client organisation and that has the right contact information, pressure could be taken away from the project team and communications with the client organisation would run smoother.

However, removing roles form the IPM team of the client has also down sides. As already mentioned in

chapter 4.2.1, when removing roles for the client's IPM team the direct supervisory body will be removed. The monitoring of the work of the members of the DC will all be the responsibility of the PM or Project Sponsor.

Competencies are considered important for every project. However, for a project with ICES the competencies needed are different. One of the main competencies needed is that the client needs to step back, and the DC should take control. This shows a link with the Best Value approach where these competencies are also needed.

5.2 Validity of this research

Weaknesses for the validity of this research can be found in the research method and scope. As research method, interviews and brainstorm sessions are used.

Interviews are a snapshot and subject to human emotions. To limit deviation between interviews, the interviews were all conducted under similar circumstances and in a small timeframe, i.e. within three weeks.

In the interpretation of the interviews, miscommunication or biases could occur. This is reduced by giving the interviewees the possibility to react to the outcomes during the brainstorm sessions. The output from the brainstorm sessions is validated through additional interviews with the portfolio manager of RWS and the project director of RHDHV.

The brainstorm sessions also brought its own weaknesses. The brainstorm sessions were conducted in groups of three or four participants. In some cases, a dominant person was present, which causes that the other participants were not always able to speak up. However, this issue was reduced by giving the participants also the possibility to write down their insights.

Concerning the scope, also some validity issues can be mentioned. For this research only one case study is used. The situation could differ at a different project with ICES at RWS. Next to this, the results are based on a project from RWS, a large Dutch public organisation. It is not known if these results are also applicable to a different Dutch client or a non-Dutch client.

5.3 Limitations and possible further research

This research has some limitations, five limitations are discussed. The first limitation is that this research is a qualitative research. No quantitative data is used to assess the efficiency of the pilot. Next, no comparison has been made between different procurement methods or contract types. Only the implication of the Best Value method is described. The same can be said about the project management approach. Only a general description of the Project Sponsor is given. No research has been done to the implementation of this project management approach and implicit consequences. Fourth, no research has been done about the legal restrictions concerning the proposed solutions for the obstructing issues. At last, the scope was limited. The influences of the client organisation and the relation with the contractor are not fully considered. The same goes for the influences of possible changes on the client organisation or the contractor.

The limitations of this research, creates possibilities for further research. Some quantitative research could be done on the efficiency of ICES. It could be discussed if there is enough quantitative data at one pilot. It is likely more pilot projects with ICES are needed to conduct a quantitative study. Most important is more research about the most suitable procurement method and contract type. Best Value is not always considered the most suitable option for a project with ICES. This could be done by comparing different procurement methods and contract types, for example with a multi-criteria analysis. Additional research about project management could create more insights about, for example, the implementation of the Project Sponsor. At last, before making changes concerning the current situation the legal restrictions and the consequences for the client organisation and the relation with the contractor should be investigated.

6 Conclusion

In this research, the main research question was: *How to govern a project with integral contracted engineering services?* To govern a project with ICES some aspects need to be taken into account. Concerning procurement and commitment, the procurement strategy should be selected with care. The procurement method should fit the conditions of ICES. Looking at the responsibility allocation, more responsibilities lie with the DC. A situation needs to be created where no misconceptions occur concerning the deviant allocation of the responsibilities. The change in distribution of responsibilities could also bring a change in risk allocation. When allocating the risk, one should keep in mind that the owner of the risk must be able to manage the risk. The next aspect that needs to be considered is the project management. The project management situation should enable fluent and clear communication between the involved parties. To conclude, to govern a project with ICES successfully, the right people should be selected, which are able to work with ICES.

7 Recommendations

In chapter 4, already several recommendations were described. In this chapter, the three most important recommendations for a project with ICES are elaborated.

The first recommendation is regarding the project management. To smoothen the communication between parties, a Project Sponsor could be appointed. A Project Sponsor could ease the communication with the client organisation. Next to this, when having a Project Sponsor, the number of roles in the client's IPM team could be reduced. Fewer roles will lead to a reduction of noise and inefficiency between the client's IPM team and the DC.

A second recommendation is to conduct more research on the procurement method and contract type. The Best Value is considered functional with a project with ICES. However, in some respects, it is not always considered optimal. Further research could determine if there is a more suitable procurement method.

Lastly, it is recommended to select the people working on the project with ICES on specific competencies. Different competencies are considered required for a project with ICES, compared with another type of project. The people working with ICES should have these competencies, which are described in chapter 3.3.

Abbreviations

DC	Delegated Client
ICES	Integral Contracted Engineering Services
IPM	Integral Project Management
RASCI	Responsibility chart: Responsible, Accountable, Support, Consulted, Informed
RHDHV	Royal HaskoningDHV
RWS	Rijkswaterstaat
OH Spijk	Overnachtingshaven Spijk
OBS	Organisational Breakdown Structure
WBS	Work Breakdown Structure
VtW	Verzoek tot Wijziging/ Request for Amendment

PM	Project Manager
CM	Contract Manager
MPC	Manager Project Control
EM	Environment Manager
TM	Technical Manager

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