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Chapter 5

Engaged Scholarship for Exploring Applicability of Relational Contracting to Nuclear Industry Projects



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and Soili Nysten-Haarala

Abstract We employed engaged scholarship as a research strategy for exploring the applicability of relational contracting in nuclear power projects. Insights from a series of workshops with nuclear industry practitioners in Finland indicated that although project alliancing is not a familiar contractual approach in the nuclear industry, the benefits of its implementation are increasingly recognised.

Keywords Relational contracting · Nuclear industry · Engaged scholarship · Finland · Project alliancing · Contracts

5.1 Introduction

Complex projects are temporal multi-organisational entities, in which the participating actors pool, integrate and coordinate resources, efforts, capabilities and knowledge to fulfil a unique common objective. Ensuring that safety and quality requirements are properly understood and satisfied in a multinational, oftentimes interdisciplinary and dynamic project context is a demanding and long-term process. Cost and schedule overruns are recognised as common performance problems in large complex projects. According to the World Nuclear Industry Status Report (2019), at least 59% of the 46 reactors currently under construction globally are delayed. In Finland, there are two new nuclear builds: Olkiluoto 3 nuclear power plant (NPP) was supposed to be operational in 2009, and at the moment of writing this chapter, it is still in pre-operational stage, while Hanhikivi 1 NPP was originally planned to

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produce electricity in 2024 and is currently planning to get a construction licence in 2021.

The World Nuclear Association recently highlighted the need to enhance collaborative or partnership approaches by indicating that standard contractual arrangements may not be sufficient to ensure that interests of key stakeholders are aligned, and appropriate procurement and project delivery models are needed to support collaborative ways of working [25]. Relational contracting has been actively implemented as a collaborative approach for handling the complex challenges experienced in inter-organisational project networks, for instance, in the infrastructure construction domain. However, relational contracting is still not a familiar approach in the nuclear industry.

This study was motivated by the need to explore the applicability of relational contracting and inter-organisational integration in complex nuclear industry projects in Finland. Our assumption is that integration of some best collaborative practices from the project alliance type of contracting to turnkey contracting could be beneficial for nuclear industry organisations. The research question was: *What are the possibilities of applying relational contracting to improve the performance of complex nuclear industry projects?* We explored the challenges and potential benefits that could be captured from applying relational contracting in nuclear industry projects.

5.2 Contractual Approaches

Traditionally, a *contract* is understood as a tool to safeguard one's own interests against the interests of other contracting parties. This classical approach is drawn from contract law, the simplified model for a contract which reflects the simple sale of goods (purchase contracts), in which the interests of the seller and the buyer mostly indeed contradict each other [16]. Since contracts bind in their original form, this approach leads to drafting contracts which safeguard the drafter in a potential legal dispute [10, 11]. Such an inflexible "hard approach" in contracting may, however, lead to official contracts, which are locked in a safe box in case of litigation together with a more flexible business practice where the hard contract is circumvented or ignored when contingencies appear [21].

However, this is not the whole truth about contracting—not even in contract law. Freedom of contract is one of the main principles of contract law, which allows contracting parties to design their own agreement. Complex long-term contracts require a more sophisticated approach, for which a contract is not only a legal tool but also a tool for business cooperation [16].

5.2.1 *Traditional Contractual Approaches in the Nuclear Industry*

The procurement and delivery models adopted by the nuclear power industry vary. Traditionally, three main contractual approaches have been employed for the construction of new nuclear power plants [20]: (1) *Turnkey or Engineering, Procurement, Construction (EPC)*: a single contractor/consortium of contractors takes the overall responsibility for the construction work and delivering a complete and functional plant to the customer. The vendor or consortium may subcontract elements of the project, which it is not able to supply itself; (2) in *split package or hybrid*, the overall responsibility is divided between a small number of contractors, each coping with a section of the plant. In more complex split packages, the overall responsibility for design and licencing and for integrating the various packages should be allocated to either the plant's owner or one of the main contractors to ensure that plant's systems work jointly properly; (3) *Multi-contract*: either in-house or more often an external architect/engineering (A/E) company is responsible for the overall design, licencing, inviting bids and selecting contractors for plant's systems, managing the actual construction work as well as for testing and commissioning. The more there are separate components, the more challenging the A/E coordinator's task will be. In all variations of 2 and 3, it is important that there is either one or only a few main responsible partners representing the whole complex project.

5.2.2 *Project Alliancing Approach*

Project alliancing, sometimes also referred to as integrated project delivery, is a project delivery method based on relational contracting and a relationship of trust between multiple parties [13]. The project parties assume joint responsibility for the design and construction of the project to be implemented through a joint organisation, share both positive and negative project risks, and observe the principles of information accessibility and open book accounting [12]. The contract does not specify duties per party, but it determines the tasks needed to complete the project and all contracting parties assume a full responsibility for their fulfilment.

Project alliancing includes strong incentives for developing best-for-project mindset and culture, unanimous decision-making and commitment to no-disputes. "We all sink or swim together" is a common motto used when referring to the way of working in a project alliance. Usually, key service providers are involved early in relation to the design process, while their capability and collaboration ability are important selection criteria. A joint development phase for the development of project solution and fixing of the target cost precedes the implementation phase.

Project alliances have so far been mostly applied in the infrastructure and construction domains. Australia has been in a leading position in the development and introduction of the system [5, 23], which is used in other countries as well, with Finland being a forerunner as a country implementing “the pure” Australian approach [14].

Experiences in project alliancing have been mainly positive and belief in the excellence of the system is strong in general. However, an alliancing approach is not suitable for all projects. The Australian national guidelines [4] instruct that: first, this approach is suitable for high value projects due to the high initial start-up management costs; and second, it is a question of a challenging and risky project, when risks cannot be adequately defined prior to tendering, the cost of transferring risks is prohibitive in the prevailing market conditions, or a collective approach to assessing and managing risk will produce a better outcome. Some criticism of the “pure” Australian approach to project alliancing has also been presented [6].

5.2.3 A Legal Perspective to Relational Contracting

The term “relational contracting” is drawn from Stewart Macauley’s famous article from the 1960s, in which he empirically proved how businessmen in Wisconsin made contracts based on trust. According to Macauley, contractual relations are more important than legal contracts “signed and sealed” [14]. Alliance contracts are typical relational contracts because they require creating and maintaining trust between the parties [2, 23]. From a legal perspective [19], these contracts represent “soft contracting”, which can be seen as the opposite to hard contracting (Fig. 5.1). Since most contracts include both hard and soft elements, this should not be seen as a dichotomy. For example, contracts in the nuclear industry typically include a lot of hard elements, such as mandatory safety regulations. However, strong safeguarding elements are often based on mutual cooperation.

Hard contracting	Soft (flexible) contracting
<ul style="list-style-type: none"> • Emphasises opposite interests of the parties • Highlights the need of the parties to safeguard themselves against risks • Uses precise and unchanging hard terms • Classic view of contract (legalistic) 	<ul style="list-style-type: none"> • Emphasises flexibility, good will, commitment to cooperate with the parties • A framework for cooperation • Uses soft term agreement of reference or standards that can be specified later • Change mechanisms

Fig. 5.1 Hard and soft contracting (adapted with permission from [18])

The classic, legalistic view approaches contracts through disputes (cases), which have been decided in courts. However, over the last two decades, proactive law has suggested that academic contract law should also focus on contracts from an *ex ante* perspective, approaching contracts as tools for enabling business. Instead of focusing on past disputes, proactive lawyers prefer to prevent problems from arising or solve them creatively before they escalate into legal disputes [8, 9]. This is not done by safeguarding for every possible risk with precise, unchanging stipulations but creating and maintaining trust between contracting parties. This approach returns contracts to businesspeople, who are the real owners of contracts [15], and supports building a collaborative climate and relations and thus advances the use of relational contracting [1].

A contract can advise in communicating between different professionals participating in the implementation. It can function as a tool for coordinating and assigning roles and responsibilities of participants. It is a guidance in changing circumstances, and definitely, a contract should create value for the parties [17].

In the nuclear industry, safeguarding against potential accidents definitely is a major part of contracting. However, communicating to prevent things going wrong is certainly as important as stipulations on safeguarding rules. Locks and threats do not prevent risks without good communication to ensure that people know what they are expected to do. Soft elements from alliance contracts could turn a nuclear project into a joint project, in which benefits and costs are shared. If it is in everybody's interest to benefit and complete the project effectively on time, they all invest in cooperation and maintaining trust. Thus, sharing costs and benefits has a safeguarding function as well. The *no claim-no blame* clause, which lawyers often criticise, is a tool in creating and maintaining a team and an atmosphere of cooperation. With this clause, contracting parties agree not to take disputes before court or even arbitration. All disagreements should be agreed between the parties themselves with joint decisions. However, this clause cannot prevent litigation in the case of gross negligence. Therefore, soft elements replicated from alliance contracts alone can only strengthen nuclear projects by motivating all the key participants for reaching joint objectives in an atmosphere of cooperation and mutual trust. In the case of alliancing, the core is joint risk and liability, which aligns the interests of the contracting parties, and the no claim clause is a kind of a "cherry on top".

5.3 Method

As a methodological approach, *engaged scholarship* refers to collaborative engagement of academics and practitioners. This engagement is characterised as "a relationship that involves negotiation and collaboration between researchers and practitioners in a learning community; such a community jointly produces knowledge that can both advance the scientific enterprise and enlighten a community of practitioners" [23, p. 7]. Engaged scholarship points to the reciprocal relationship between academics and practitioners in terms of bridging the knowledge gap, and different types of

reciprocity have been identified in project research contexts [7, 22, 24]. The “Scandinavian tradition of engaged scholarship” is characterised by investing a substantial amount of time in collaborating with industry partners and communicating results specifically to practitioners [22].

We designed and conducted a series of workshops in the Finnish nuclear domain to explore the possibilities of relational contracting in nuclear industry projects. We invited nuclear industry practitioners—representatives from the nuclear industry companies and the regulator in Finland—to the workshops. One of the workshops was international and cross-industrial, aiming at sharing insights from experiences with project alliancing and management of complex construction projects in Finland, Australia and the UK. The workshops collaboratively engaged researchers and practitioners from the industry and the regulator in discussing the possibilities of applying relational contracting to improve the performance in complex nuclear industry projects in Finland.

5.4 Results

Key insights from the workshops series in terms of potential benefits and challenges for applying relational contracting are presented as an illustration of engaged scholarship for exploring the applicability of this contractual approach to the nuclear industry. Regarding project alliancing and its application in the nuclear industry in Finland, it was highlighted by practitioners that in this industry it is very important for the actors to have independence, clear lines of responsibility and well-defined liability to ensure that the actors’ roles do not become mixed. This relates to the fact that, in the nuclear industry, the licensee is responsible for safety. For example, the licensee needs to independently verify documentation prepared by other parties; yet, it was acknowledged that open communication, good relations and collaboration in the project are of utmost importance.

The practitioners considered it as very important to facilitate collaborative working on projects, and the safety regulator representatives particularly reflected on their role in promoting collaboration. One of the discussion points was how the current Finnish regulatory guides on nuclear safety promote or restrict a collaborative working mode in projects.

Co-locational collaborative project spaces that would enable inter-organisational collaborative working in the same physical space were considered as an interesting approach that would potentially facilitate knowledge sharing, collaborative practices and inter-organisational coordination. The safety regulator also saw this as a promising avenue to facilitate a relational orientation in everyday work but expressed concerns over confidentiality issues in co-locational spaces. The potential for the safety authority representatives to work in the same co-locational space was also discussed but challenges were seen to be related to this kind of arrangement due to the regulator’s independent role. The practitioners, however, considered the benefits of the co-locational space to crystallise in the improved transparency and visibility

of the work of others, as well as the increasing relational capital and trust among the project participants when they are working in the same premises.

The cultural diversity of the project participants was also a recurrent theme in the workshops. Although cultural diversity was considered to bring value to the project, cultural distance was seen to weaken the practical possibilities for relational contracting and collaboration. One reason for this was that different parties may have different understandings of what relational contracting and collaboration means in practice. This may also favour a strong impetus toward traditional contracting and safeguarding of issues as this is the practice that the parties are used to.

It was also brought up that the nuclear industry, as a highly regulated industry, has a strong controlling approach in terms of ensuring nuclear safety, preoccupation with failure and a tendency to view issues through the perspective of risks instead of opportunities. This, in turn, may favour the use of traditional contracting solutions and limit flexibility instead of using relational contracting approaches that emphasise more value co-creation and joint co-operation. The transformation towards the use of relational contracting is then also a significant institutional change effort which requires a lot of institutional work and questioning of the fundamental values shared by the industry actors. As practitioners noted, it is easier to talk about the need for collaboration in theory than to actually implement it in practice.

Practitioners also showed interest towards integrating some of the collaborative practices into traditional contracts and projects, introducing then some kind of hybrid contractual solutions that would support collaboration in practice. One potential area related to this was the introduction of bonus schemes and reward structures to the contracts that would motivate parties to share information, instead of a focus on penalty culture and sanctions in the contracts. Practitioners expressed concerns over the situation where the contracts do not encourage parties to share information in order to safeguard themselves and were considering solutions for improving, e.g. through statements on proactive information sharing and commitment toward that kind of culture.

The limitations of the current practice of turnkey contracting were recognised, too: for ensuring nuclear safety, in practice, the owner or licensee has to do more than formally required in the contract by supporting the contractor's duties. Especially when the suppliers are not very familiar with the local regulatory requirements, collaboration between actors needs to be intensified to ensure timely and proper understanding of the challenges and availability of information to support decision-making and delivery of high-quality safety documentation. If suppliers are not used to working according to rigorous regulatory requirements, this could make nuclear projects unattractive or even risky for them.

Regarding project alliancing and its joint liability, it was discussed that collaboration and risk sharing may encourage suppliers to tender since this delivery form creates favourable conditions for trust building and shared learning while mitigating the risks for suppliers. Flexible contractual approaches offer more room for adaptability in changing the project's goals/objectives. They set conditions for discussing and agreeing with suppliers, and offer novel ways to consider the suppliers' role in the project. All in all, it was recognised by the practitioners that relational contracting

may bring benefits for overall performance of nuclear projects, and its application can be flexible too: for instance, relational contracting could be considered in subsections of a project with specific/strategic suppliers and not necessarily applied at the level of the overall project.

5.5 Conclusion

Large complex nuclear industry projects present significant managerial challenges as they seek to ensure a shared understanding of safety, develop common goals and achieve a good safety culture among the temporary network of participating organisations. Recent evidence from complex project research indicates that contractual approaches that promote the development of relational capital and trust-based social norms among project members are the most effective approaches to ensure the success of such projects [3].

In this chapter, we utilised engaged scholarship as a collaborative inquiry between academics and practitioners to explore applying relational contracting for improving project performance in the nuclear domain. EPC or turnkey contracting has been the traditional model used by the nuclear energy industry globally, which shapes a sort of path dependency and leaves little room for innovative contractual solutions. Yet, this study indicates that attitudes are changing and possibilities to improve the overall performance of nuclear projects via collaborative arrangements of relational contracting are increasingly being considered. Relational and proactive contracting approaches can be used side by side with more traditional approaches in the nuclear industry. Good relations between project actors are beneficial for preventing and mitigating dispute risks and misunderstandings and thus have implications for safety performance.

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