



INVESTIGATING INTEGRATED PROJECT DELIVERY AS A STRATEGY TO IMPROVE NUCLEAR POWER PLANT CONSTRUCTION PERFORMANCE

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ABSTRACT: Recent nuclear power plant construction in the United States has faced significant cost and schedule overruns as cited by several references. Exploring new project delivery system and contracting strategy can enhance project success, and optimizing these in new-build nuclear power construction could potentially reduce capital cost and improve cost and schedule overruns. One of the goals of this paper is to explore the potential of collaborative project delivery system models, specifically integrated project delivery (IPD), to address these issues and improve project performance outcomes in new-build nuclear construction, including small modular reactors (SMRs). To achieve this goal, a qualitative approach was used to conduct semi-structured interviews with 25 reputable industry experts to assess the feasibility of IPD in the nuclear power construction sector and identify the primary challenges to its implementation. Interview results indicated the importance of the planning phase in project delivery, a key IPD element. The analysis found that IPD may allow for further improvement in nuclear power construction performance given the technical complexity, regulatory environment, and unknown risks associated with these projects. The results of this paper are intended primarily for Nuclear Owners, but also for the Government and Reactor Vendors, to understand whether to and how to use IPD as a risk mitigation strategy for cost and schedule overruns in the nuclear industry. As a result of this research and other research publications, the Tennessee Valley Authority (TVA) has selected an IPD approach to plan, design and construct the Clinch River 1 Small Modular Reactor project.

1. INTRODUCTION

The construction of new nuclear power plants in the United States faces significant challenges, including high capital costs, a complex regulatory environment, long construction durations, and frequent overruns in cost and schedule (Office of Nuclear Energy 2021). The US DOE (Department of Energy) has recognized the importance of delivering nuclear power plants on time and within budget, particularly as the energy transition drives energy generation away from carbon-based sources. New nuclear construction is typically a megaproject, and megaprojects are often associated with high capital cost and schedule overruns. However, even by megaproject standards, nuclear projects tend to perform particularly poorly (Merrow n.d.; Flyvbjerg and Gardner 2023). A recent example of extreme cost and schedule overruns in nuclear power construction includes the Vogtle project in Georgia, and a recent example of project abandonment includes VC Summer in South Carolina (Amy 2023). Literature review reveals three primary contributors to these

poor performance outcomes are lack of a standardized design, ineffective management practices, and misallocation of risk (Merrow n.d.; Brewer 2021; Gogan and Ingersoll 2018; Roulstone 2019; MIT 2018; WNA 2023). This paper is part of a wider, DOE-funded project exploring how more collaborative project delivery practices could address these challenges. Specifically, this study qualitatively examines the role of project delivery systems in nuclear megaprojects, focusing on the potential benefits of early collaboration to improve performance outcomes.

As discussed above, project delivery (PDS) plays a critical role in the financial success of a construction project. Both the Vogtle and VC Summer projects – widely known for their poor construction outcomes – utilized a traditional design-build contracting strategy, which is where a single EPC (engineering, procurement, and construction) contractor is responsible for the entire project lifecycle. In contrast, Integrated project delivery (IPD), a collaborative contracting strategy, presents a promising approach to reducing cost and schedule overruns. The AIA defines IPD as “a project delivery method that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to reduce waste and optimize efficiency through all phases of design, fabrication and construction.” (AIA 2014). The goal of this paper is to explore IPD as a potential solution to challenges in new nuclear construction, where a lack of collaboration often leads to cost overruns driven by poor upfront planning and contracting strategies (Roulstone 2014; Locatelli et al. 2014; Sovacool et al. 2014).

Since its introduction in the early 2000s, IPD has been widely successful in the healthcare industry, which involves high-value, complex projects subject to strict regulations (Patel 2022; CII 2019). First-of-a-kind (FOAK) projects using IPD have achieved cost savings of 2–10%, while projects employing the same team across multiple endeavors have realized up to 30% savings through continuous learning and improvement (AIA 2007). Industry experts also highlight additional benefits of IPD, including increased productivity, improved production techniques, enhanced morale, and stronger relationships. However, challenges remain, particularly in recognizing its long-term value and the limited experience with the IPD model in certain industries. Recent studies at the University of Wisconsin-Madison indicated that traditional project delivery models such as Two-Firm and Owner+EPC experience lower percentage schedule overruns than other delivery approaches such as more traditional PDSs. This suggests an opportunity for IPD to enhance these models by leveraging its collaborative contract and delivery framework to further reduce cost and schedule overruns (Welker 2024).

The key distinction between traditional contracting and IPD lies in risk management and allocation, as IPD emphasizes risk sharing rather than risk transfer. Traditional PDS and contracting methods often struggle due to an individual stakeholder financial success being independent of project success (Allison et al. n.d.). Since the success of the Owner is directly tied to the success of vendors, it is crucial for all parties to have a vested interest and aligned objectives. IPD contracting principles put these goals into practice, making IPD a potential contracting model for these projects. In addition, when compared to established delivery systems in other industries, IPD has proven to achieve significant improvements in the areas of quality, schedule, project changes, communication among stakeholders, environmental, and financial performance (Asmar 2013).

IPD has slowly taken off in the nuclear industry, with Ontario Power Generation (OPG) pioneering the first true IPD contracting strategy on a new build nuclear grid-scale Small Modular Reactor (SMR) project in Canada. The project is currently in the validation phase and construction is expected to be complete by late 2028. This contract style was chosen due to its efficient collaboration and communication benefits which aim to reduce construction complexities, delays, and cost overruns typical of new-build nuclear. The key participants on the multi-party contract include OPG (Owner), GE Hitachi (Reactor Vendor), SNC-Lavalin (Architect Engineer), and Aecon (Constructor). OPG is already working with SNC-Lavalin and Aecon in an IPD-like setting on a nuclear refurbishment project for their existing Darlington nuclear power plant, which has remained on time and on budget (World Nuclear News 2023) (Patel 2023). More recently, the Tennessee Valley Authority (TVA) has selected IPD as the contracting approach to plan, design, and construct the Clinch River 1 SMR project in Tennessee (ANS 2025).

Potential downsides to the IPD contracting method include the complexity of contracts due to risk allocation, lack of familiarity with IPD concepts, challenges with industry adoption stemming from cultural resistance, and a lack of trust among parties involved, particularly with regards to data sharing between parties (Kent and Becerik-Gerber, 2010). Existing literature explores potential strategies to address these barriers in the context of nuclear construction. Roulstone highlights the critical importance of cultural change within the nuclear power sector, while Gogan and Ingersoll emphasize the necessity of completing (or nearly completing) project planning and design before construction begins. Additionally, the Nuclear Energy Institute (NEI) underscores the value of clearly defining roles and responsibilities within collaborative contracts, which fosters trust, incentivizes data sharing, and enables effective risk allocation.

To analyze the feasibility of IPD in the new-build nuclear power plant construction industry, a qualitative approach was used,, engaging nuclear industry and IPD experts to assess project delivery practices, working relationships, and opportunities for improvement. The study focuses on assessing industry familiarity with IPD and its suitability for new-build nuclear projects, evaluating current project delivery methods and satisfaction levels in nuclear construction, identifying key challenges to IPD implementation in the nuclear sector, and providing recommendations on whether and how to implement IPD in nuclear power plant projects.

This paper provides a snapshot of the research performed as a part of the broader research effort investigating the viability of collaborative approaches to new nuclear power plant construction. The findings presented within this paper are intended primarily for Nuclear Owners, as well as the Government and Reactor Vendors, to determine the feasibility of IPD as a risk mitigation strategy for cost and schedule overruns in nuclear construction. However, contractors can benefit from this study by reviewing the risk associated with construction of new-build nuclear power plants.

2. METHODS

This research study engaged twenty-five experts in both the nuclear industry and IPD to provide insight into the challenges and barriers to implementing IPD in the nuclear industry. The primary target group for interviews was nuclear Owners (Utilities); however, other individuals within the nuclear industry were considered to receive a variety of perspectives. Most candidates (22) came from North America. International experts (3) were also consulted. This research effort also consulted leading IPD industry experts to understand the cultural and legal challenges of IPD. Interview candidates were identified by the leading PI in the research effort. A suitable interview candidate had at least five years of experience in the nuclear industry and familiarity with contract types and organizational structures of projects.

The interviews aimed to assess the current state of new nuclear construction by analyzing familiarity with IPD, existing project delivery practices, satisfaction levels, and the risks and barriers to IPD implementation in the nuclear industry. Interview questions were developed using guidance provided by the Project Delivery System (PDS) Assessment Tool, a tool composed of driving questions designed to help Owners select the most suitable project delivery system based on various project and owner factors. A similar tool, created by the research team at the University of Wisconsin–Madison funded by the Construction Industry Institute for industrial projects, served as a guideline for adapting this tool to the nuclear industry. The interview objectives provided the framework for this adaptation (CII 2021).

Inductive content analysis was used in this research effort. This is a common method for qualitative data analysis that examines the data collected from the interviews and categorizes the common themes into groups and subgroups. The themes were determined by the research team alongside the guidance of industry experts. The two types of inductive content analysis are thematic and conventional content analysis. Thematic identifies the high-level common themes, and conventional identifies the frequency of the themes. Both were used in this study to display interview results, as response frequency is often reported alongside the key theme or idea.

The interview process involved the following phases: preparation, interview, data transcription, manual coding, grouping, and reporting. The preparation phase involved selecting and coordinating with interview participants. The interview phase was next, which adopted a semi-structured approach. The interview

phase began with a pre-interview questionnaire, completed by each participant, to gather information on their experience and company profile. Two questions were also asked in the pre-interview questionnaire to target current satisfaction and familiarity with IPD. After the pre-interview questionnaire was completed, a one-hour virtual interview was held to address further questions related to industry readiness and IPD integration, including challenges and barriers, in the nuclear industry. Following the interview, the data transcription phase was completed, which involved reviewing the notes taken during and/or reviewing the recording after the interview. Following this, the manual coding phase involved compiling the transcribed data of all the interview candidates together. Next, the grouping and categorization phases involved further analysis of the manually coded data to determine which key themes or topics were repeated or more frequently discussed with interviewees. These two phases were iterative to help remove researcher bias. Lastly, the reporting of the main themes and findings from the interviews based on the grouping and sub-grouping that had been established.



Figure 1: Qualitative Data Collection Process

3. RESULTS

Repetition of themes was common among the responses to the interview questions. Not all responses are included; rather, only repeating overarching themes or responses are addressed.

Industry Standard Procurement Model: When asked about the current new-build nuclear power industry standard procurement model in North America, the most common response was EPC (Engineering, Procurement, Construction) with a Cost-Plus Fee, Cost Reimbursable or T&M (Time and Material) contract, which can be considered the same for this purpose. The heavy reliance on EPC in North America is due to nuclear owners no longer having the experience to take on new build nuclear projects. Many also noted that lump sum or fixed firm price contracts with incentives were more common in the past but would never work in today’s nuclear setting due to inexperience and project complexity. However, two individuals noted there is no current standard, which potentially allows for a new model, such as IPD, to become the standard.

Importance of Project Phases: A project progresses through four main phases: conceptual planning, detailed planning & design, construction, and operations. Each phase is important to project success, but some phases carry crucial weight on the project in terms of preventing poor project performance. When the interviewee group was asked which project stage has the highest chance of poor performance, 60% of respondents identified the planning phases (conceptual planning and planning/design) as most critical, but 28% respondents also mentioned construction. Of the individuals who responded to construction, most acknowledged that the shortcomings in the construction phase are often a cause/effect relationship due to poor planning upfront. Additional interviewee commentary for the responses is provided in Table 1.

Table 1: Additional Commentary for “What Project Stage Has the Highest Chance of Failure in Achieving Project Success?”

Response	Comments
Conceptual Planning	“Project is over if it is a bad contract when you start.”
Planning/Design	“Consequences do not show until construction.”
Construction	“Risk is greatest if you have not designed and planned right.”

To summarize, the majority of interviewees recognize the importance and influence of the conceptual planning and planning/design phase on the overall project success. To better control the cost and schedule overruns experienced by the US nuclear industry, emphasis needs to be placed on the planning phases to ensure the project is set up for success in the beginning. This includes selecting mature reactor technology, finishing design prior to construction, creating realistic cost and schedule baselines that

all parties know they can achieve, and establishing a decision-making plan that provides parties with both empowerment and accountability.

Adversarial vs Collaborative Environments: In all projects, adversarial and collaborative relationships exist given the difference in priorities and profit motives because of the differences in long-term business plans. It is natural to protect oneself and/or one’s company from losses; however, this approach does not create an environment conducive to learning and exchanging ideas. When surveying the interviewees regarding current relationships among stakeholders in the nuclear industry under traditional delivery methods, 74% of respondents recognized the current process and relationships as adversarial, and no one answered that it is collaborative in nature. Five respondents (26%) mentioned elements of both adversary and collaboration depending on the context and the parties involved. Additional commentary from this question is provided in Table 2.

Table 2: Additional Commentary for “Is the current process adversarial or collaborative?”

Response	Comments
Elements of Both	“Tends to be more collaborative at working level, but when money comes into play, it reverts back to adversarial.”
Adversarial	“Incentives and contract strategy puts one party against another.”

Though most acknowledge the current process as heavily adversarial, nearly 85% of respondents believe a collaborative approach would be accepted by the industry. However, it is important to note that nuclear Owners/Utilities make up nearly half of all interview candidates, and as noted in the commentary above, Utilities are more inclined to be receptive to collaborative practices. The presence of optimism bias is also likely. Of the interview participants, 85% of respondents answered “Yes,” 5% answered “No,” and 10% answered “Maybe.” The singular “No” response comes from an interview candidate outside of the nuclear industry, which again reaffirms the potential of optimism bias in the other responses. Additional commentary for each is provided in Table 3.

Table 3: Additional Commentary for “Do you believe a collaborative based approach would be accepted in the nuclear industry?”

Response	Comments
Yes	“Night and day difference in collaboration.”
Maybe	“New concept to the industry but seems to be the only way to be successful now.”
No	“Nuclear is stuck in procedural ways.”

There is a positive reception to switching the adversarial approach to a more collaborative approach. The collaborative approach of IPD is used to gain alignment among partners by incentivizing towards a common goal based on success of the project rather than success of the individual.

Preparation for New PDS Model: The IPD model is not new; however, it is relatively new to the new-build nuclear industry. There is currently one utility in Canada pioneering its use for new build nuclear due to their success with IPD type models on nuclear refurbishment projects. Most recently, this study among others resulted in selection of an IPD contracting strategy for the TVA Clinch River 1 Project in Tennessee (ANS 2025). Interview candidates were asked whether the nuclear industry is prepared for another PDS option such as IPD. There is wide variation among whether the industry is prepared for a new PDS option. Of the twenty-one candidates interviewed, 33% responded “Yes”, 38% responded “Maybe”, and 29% responded “No”. Some of the additional commentary is provided in Table 4.

Table 4: Additional Commentary for “Do you believe the industry is prepared for another PDS option?”

Response	Comments
Yes	“Open to options because [the] industry does not have a settled blueprint right now.”

Maybe	“People need to understand the behavioral shift and high expectations [in IPD]”
No	“Failure to learn and failure to change.”

The primary concern surrounds resourcing, which includes staff, subject matter experts, and upfront money, among other things. It is recommended to always consider the lessons learned from existing financial failures and avoid assuming a new PDS model can eliminate past recurring problems in PDSs. Further, if deploying IPD for the first time, an Owner may wish to strongly consider a subject matter expert with experience in the IPD model to overcome the initial hurdles of lack of knowledge and resources. Finally, an Owner may wish to transition to full IPD by first implementing a few critical IPD components.

Beyond the physical resources of manpower, IPD requires substantial early collaboration between key stakeholders, resulting in upfront planning costs to be borne by the Owner. Interview candidates were asked about Owner willingness to spend additional money upfront. Ten interview candidates (67%) responded “Yes,” one (7%) responded “No,” and three (27%) responded “Maybe.” Additional commentary for each response is provided in Table 5.

Table 5: Additional Commentary for “Are Owners willing to spend additional money upfront?”

Response	Comments
Yes	“IPD requires corporate investment through training programs, IPD coaching and strategic hiring.”
Maybe	“The return on investment needs to be right.”
No	“Reluctance to spend money on planning.”

Most owners are willing to spend money on upfront planning to see improvements in PDS, but this has to be recognized as an inherent risk with IPD. To minimize this risk, Owners should utilize reimbursable contracts with their key stakeholders and establish clear expectations of resourcing, meeting commitments, and schedule and/or planning deadlines at the forefront of the validation phase.

Most Owners are willing to spend more money to improve PDS, but IPD also requires the Owner to be an active member on the IPD team. Of the candidates, 75% acknowledge that Owners are willing to be active members; however, a few responses indicated that it depends on the Owner. Further, one “No” response indicated that this would be extremely challenging without help from a consultant; however, this response did not come from a nuclear Owner organization. Additional commentary is provided in Table 6.

Table 6: Additional Commentary for “Are Owners prepared to become active members of the IPD team?”

Response	Comments
Yes	“Owners want to be involved and involvement could be part of the problem.”
Depends	“Utilities want to be involved, but new companies do not as they are naïve and inexperienced.”
No	“Need help from experienced consultants.”

Most owners are willing to take an active role with IPD, but it is critical for owners to recognize their strengths and weakness and utilize the smart buyer approach to avoid making decisions in an area of Owner incompetence. The smart buyer approach chooses key stakeholders that are competent in their respective area. Owner challenges and barriers associated with active involvement on the IPD team have been identified through this interview process as cost alignment, risk pool, decision-making process, sufficient resources/learning curve, micromanagement, and lack of trust in stakeholders. The most prevalent theme is the lack of trust in other stakeholders, followed closely by micromanagement, which works hand in hand with trust. The decision-making process was also identified as a possible challenge. Regarding the decision-making process, it is important for all decisions to be resolved at the lowest level possible in a timely manner. Building trust is critical and inherently should reduce micromanagement. To

build trust among the team, it is important that Owners use the best athlete approach to select organizations and team members with cultures and personalities that align well with the IPD culture.

Interview candidates were asked to identify the main obstacles preventing Owners from pursuing better practices in PDS. The interview candidates' responses consisted of lack of awareness of options, cost uncertainty, complete design is a higher priority, no model contract, front-end planning cost/resources, resistance to change, lack of contractor/vendor experience, and lack of owner experience. The most frequent response was lack of experience, in terms of both the Owner and contractors/vendors, which accounted for 34% of responses. Many Owners are waiting for guidance due to the "fear of being first," "more than normal resistance to change," and comfortability with how things have always been done. A unique response was the lack of awareness of other PDS options. The respondent noted that "people aren't interested in changing PDS because they are either too old [to care] or too young [to know any better]."

Most stakeholders that will be asked to join the IPD core team will be unfamiliar with the culture of IPD and will encounter challenges in this regard. Interview candidates identified creating culture/knowledge and consensus-based decision-making as the most prevalent challenges for stakeholder engagement. The anticipated stakeholder challenges are like Owner challenges as mentioned previously and revolve primarily around lack of experience with an IPD model and learning to trust.

The Multiparty Agreement: A key feature of IPD is the use of multiparty arrangements to contractually bind the key stakeholders together, rather than separately with the Owner. The result of these interviews is what the research team envisions the multiparty agreement should look like on a nuclear power plant construction project. The interview candidates were asked to identify the players needed on the core IPD team and the results are presented in Figure 2, which shows the percentage of respondents who identified the inclusion of various parties within the IPD Team. It is noted that out of the respondents who did not include 'reactor vendor' on the multi-party team, all but one did include key equipment suppliers, and therefore may have been considering the reactor vendor to be a key equipment supplier.

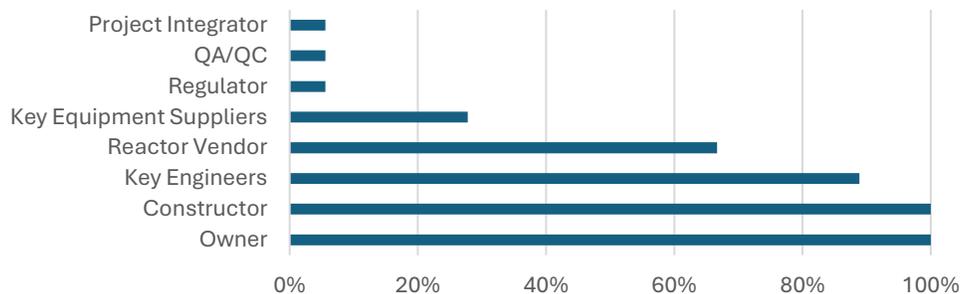


Figure 2: Various Parties Identified within the IPD Team by Interview Respondents (Welker 2024)

Based on the responses, the team should therefore include four players: Owner, Constructor, Reactor Vendor and Key Engineers, as shown in Figure 3. The key engineers are typically the site architect/engineer and the reactor engineer. Reactor engineering is most often done by the Reactor Vendor, but the site architect/engineer may also be capable of engineering nuclear components. Many candidates also promoted a leaner team since "too many idle people are too many idle problems," and everyone needs to provide value. Further, if the IPD core team were to be expanded, it should only be expanded to players that affect the critical path because they "work on a complex scope and will be building at the same time as others." In addition, expansion to equipment suppliers will be a challenge because suppliers only fabricate the parts and will not want their returns tied to the overall performance of the project. It should also be noted that the players not included on the core team are a risk because they are less incentivized to perform well compared to the core team (Welker 2024).

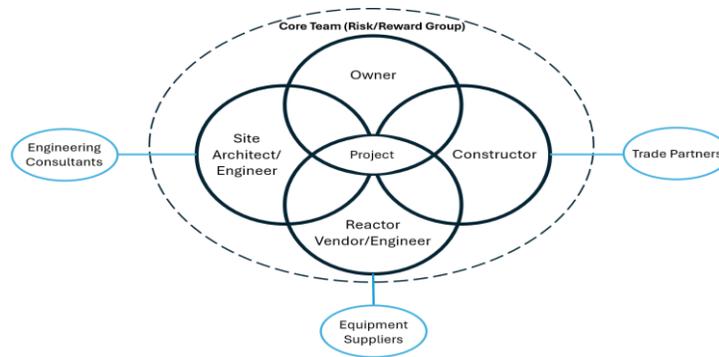


Figure 3: Organizational Structure for Nuclear Power Plant IPD Contracting (Welker 2024)

Results Summary: IPD experts, owners' representatives, and nuclear experts agree that upfront planning is critical to project success. Nuclear experts see potential for IPD as an alternative delivery method but note challenges such as cultural and regulatory barriers. They also cite limited information sharing and access to expert advice as concerns. IPD experts stress that fostering the right culture is essential for successful implementation. However, owners' representatives and nuclear experts point to the nuclear industry's resistance to change, driven by a culture of risk aversion.

4. DISCUSSION

This research study is grounded with several limitations. It is important to note that IPD is not suitable for all projects, but certain characteristics make a project a good candidate for this delivery method. Based on interviews with individuals experienced in IPD, suitable candidates typically include large, complex projects with a core team contract value of at least \$50 million, highly regulated projects where incremental reviews and deadline adherence are crucial, and projects with unknown unknowns, requiring a collaborative environment to address unexpected risks. These criteria are particularly relevant for new-build nuclear projects. Additionally, a cultural shift is necessary for successful IPD implementation, as it demands a significant mindset change. All interviewees highlighted the importance of culture in adopting IPD, noting that upper management must lead the change, which must then extend to the field. Regarding insurance, the primary factors influencing premiums are project scope, duration, risks like hazardous materials, and state regulations. The contract method and PDS impact risk allocation and team dynamics, which can affect policies such as professional liability insurance and worker's compensation. IPD projects typically have lower professional liability premiums due to reduced risks of stakeholder litigation and improved safety through more efficient collaboration.

In addition, this research took a two-part approach to first assess past PDS performance and then to address possible improvements with collaborative contracting. The ideal interview candidates would have been involved with new build nuclear on those past projects; however, much of that construction occurred between 1970 and 1990. Those individuals have since retired or passed away. For this reason, many of the interview candidates have not been involved in a new-build nuclear plant, but rather smaller refurbishment projects of the existing fleet. Their perspective on collaborative contracting strategies such as IPD could be different from someone who has built new-build nuclear recently.

Lastly, the qualitative interviews engaged twenty-five individuals from sixteen different organizations, and one organization had five interview candidates participating in the research effort. Most candidates also represented nuclear Owners. It is highly likely that the candidates' responses from the same organization and/or the same roles are similar because of the company culture, overarching business plan, and professional responsibilities. The interview responses were consolidated to lead to common themes and conclusions; however, there are many other industry perspectives whose voice may not be portrayed through the individuals that were interviewed.

Recent news released in January 2025 revealed that Tennessee Valley Authority (TVA) had selected an IPD contracting strategy for the planning, design and potential procurement, construction and commission of the Clinch River 1 Small Modular Reactor (SMR) in Tennessee. Working in collaboration with Bechtel, BWX Technologies, Duke Energy, Electric Power Research Institute, GE Hitachi Nuclear Energy, Indiana Michigan Power, Oak Ridge Associated Universities, and Sargent & Lundy, this selection suggests that the approach to PDS and contracting strategy in nuclear power plant construction is evolving from traditional methods (ANS 2025).

5. CONCLUSIONS

The application of IPD to the nuclear industry was discussed through interviews with twenty-five industry experts to understand the current perspectives and challenges surrounding IPD. Of those interviewed, a large majority were familiar with IPD concepts prior to the interview process.

Responses from individuals with IPD experience in other industries indicated that nuclear projects are a suitable candidate for IPD due to the level of complexity, high regulation, capital investment, and number of unknowns. However, the significant cultural and behavioral shifts required by IPD was identified as a challenge by those with an outsiders' perspective on the nuclear industry due to the heavy resistance to change given the current demographics of the nuclear industry in the United States.

Interviews with individuals currently in the nuclear industry yielded the following key themes.

- The planning phase is critical to overall project success, and time and money should be allocated appropriately to this process to ensure maximum value is achieved during this phase. A key historical failure has been the lack of upfront planning leading to construction beginning before a complete design.
- There is a positive reception for collaborative working relationships and IPD. However, this enthusiasm could be attributed to optimism bias, as many interviewees also noted hesitation to be the first to try IPD. A key historical failure has been falling into adversarial relationships due to contract structures putting parties against each other, instead of working towards the same goals.
- The IPD model is challenging given the lack of experience and resources on all sides: Owner and other key stakeholders. With a first-time application of IPD, Owners should consult with a subject matter expert and carefully select a leadership team using the "Best Athlete" approach.

Financial transparency, shared risk and reward pools, limits to liability, and consensus-based decision-making are all critical elements of the IPD model that must be fully understood, and the processes of each developed through collaboration with all key stakeholders. The decision-making process should be efficient by resolving issues at the lowest level possible in a timely manner, and owners must recognize their strengths and weaknesses when making decisions and selecting trade partners.

Finally, it is important to understand that PDS is not the only piece missing in the puzzle. PDS and contracting strategies are just one component of the bigger picture when it comes to solving the historical construction performance problems in the United States nuclear industry.

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