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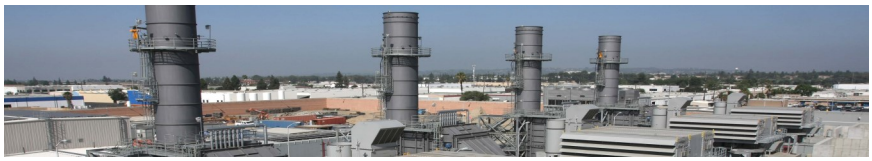

KEY CONSIDERATIONS IN EPC AGREEMENTS FOR RE-POWERING PROJECTS

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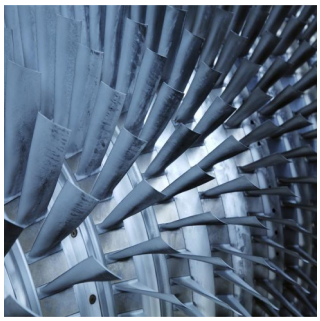

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I. Re-Powering Projects: Risk & Issues

Driven by low natural gas prices, permitting efficiencies, and political and economic headwinds against coal-fired generation, many U.S. power companies are working to increase the capacity of their existing fossil-fuel facilities by "re-powering" them as combined-cycle gas-fired facilities. When considering the contracts for the engineering, procurement and construction (EPC) of these projects, one might be tempted to assume that re-powering an existing plant would be a relatively simple contractual matter, when compared to the full construction of a new greenfield project.

To the contrary, there are several unique aspects of re-powering projects that create material risks beyond those encountered in a typical greenfield EPC project. These additional risks complicate the overall EPC contracting approach for such projects, and can present serious challenges to the classic "turnkey" risk allocation model frequently pursued by facility Owners, and favored by their lenders. Contracts for these projects will frequently require complex, customized provisions that identify and allocate responsibility for these risks, rendering any standard form greenfield EPC contract inadequate. This article examines, from the Owner's perspective, several of the unique aspects and risks presented by re-powering projects, and suggests certain contractual strategies for allocating or mitigating the same.

For the sake of illustration, this article assumes the hypothetical re-powering of an existing steam turbine-generator (the "**Existing STG**") into a "2x1" combined-cycle configuration, by adding two heat recovery steam generators (the "**HRSGs**"), and two, new large-frame gas-fired turbines (the "**New Units**"). It further assumes that the project is to be undertaken at the site of an existing power -generation facility where other units are in operation, and that there will be multiple points of interface between the new project and the facility's existing water, steam, gas, electrical, control and/or other critical equipment, systems, instrumentation and infrastructure on the site (the "**Existing Systems**"). Despite this assumed scenario, much of this article's insights will also apply to projects that involve the wholesale replacement of existing coal-fired units with a new combined-cycle power island, where Existing Systems will remain in place to support the new power island.

II. Overall Project Approach—Assembling the Jigsaw Puzzle

Overall Contracting Structure

Any Owner considering an EPC project must first decide which contracting structure is appropriate for overall project delivery. At one end of the spectrum lies the "multi-prime" approach, where the Owner enters into various engineering, equipment supply, and construction contracts, taking on the responsibility and risk of managing the costs and schedule of the overall project. At the opposite end of the spectrum lies the "turnkey" EPC contract between the Owner and a single EPC contractor who takes sole responsibility for delivering the entire project on time and on budget. Between these poles are various alternatives, and where a given Owner will land between the two will depend upon several inter-related factors. These factors may include the breadth of the Owner's experience in major project management, the depth of its internal resources and capabilities, the Owner's risk appetite, the current markets for major equipment and/or "turnkey" EPC services, and limitations of the project's economics.

This contract structuring issue is certainly not unique to re-powering projects. However, various aspects of a re-powering project may further complicate the Owner's decision-making process for solving the issue. For example, if modifications or upgrades will be required on the Existing STG to prepare it for the envisioned combined-cycle operation, there may be good reason for the Owner to retain the original equipment manufacturer (OEM) of the unit to perform such work. Perhaps the Owner views the OEM as being more familiar with the unit and thus more qualified for the job. Or perhaps the OEM has patented technology that only it can implement into the unit as part of a necessary upgrade. It could also be the case that the OEM is willing to guaranty the post-modification performance of the Existing STG, a guaranty that might not be forthcoming from a non-OEM provider. Without such a guaranty, there would be a considerable hole in the overall power island performance guarantees, increasing the project's risk.

Similar issues arise when the Owner seeks to procure the New Units and the HRSGs. Should one contract directly for those items? Or should one retain a competent EPC contractor to procure them, along with balance of plant equipment? As a variation on this theme, the Owner might contract directly for these items with the intention of assigning these contracts to an EPC contractor for management, if not for a full turnkey wrap of schedule and performance. Perhaps the New Units OEM would be willing to provide (via its own subcontract) the HRSGs as well? In this event, the New Units OEM might be willing to provide a performance guarantee that covers combined performance of the New Units and the HRSGs – one step away from a full power-island performance guarantee. If the New Units OEM is also the OEM of the Existing STG, then perhaps that full guarantee is within reach. However, what if the Existing STG OEM is a competitor of the New Units OEM? Trouble in paradise?

Installation and Balance of Plant Considerations

These are but a few of the several considerations that an Owner can face in the context of modifying or procuring the major equipment components for a re-powering project. However, there is also much to consider beyond the major equipment. For example, an Owner must evaluate the merits of various approaches for the engineering and design of the overall project. This is no minor or risk-free task. The engineering and design work will drive decisions as to the specifications (and thus potential sources) of the New Units and HRSGs in the first place. Such engineering and design must also include the integration of the operations of the Existing Systems of the facility with the New Units and HRSGs, specifying any required new civil, mechanical or electrical works, and modifications to Existing Systems, as necessary to support such operation. Thus, the Owner must decide who will perform this complex and important work and plan the stages of its performance. Might the Owner's in-house staff or an outside engineering firm perform preliminary engineering work in order to establish initial parameters for scoping the project and its costs? Or perhaps the work would better be outsourced to a

preferred EPC contractor's engineering team, with the intention that it would serve to underwrite certain performance guarantees from such contractor, were they to be selected for the construction and installation of the project?

Such construction and installation work presents yet another area for Owner analysis and planning. Depending on its internal resources, risk appetite and other factors, an Owner may elect to retain and manage some or all of the required construction and other trade labor on its own, while other Owners would not hesitate to outsource this work. The installation work for the New Units and HRSGs will require particular expertise and focus, given the heightened risks of project delays due to the complexity of such installation and the risk of voiding OEM warranties if such work in not properly performed.

Thus, these types of factors will drive an Owner's decision-making process as regards contract structuring for overall project delivery. Like assembling a jigsaw puzzle without the box-top picture as a guide, only by gathering all of the pieces and considering the various possibilities for fitting them together will an Owner be able to develop a view as to the optimal contractual structure for the project. In instances where this analysis results in a multi-prime contracting approach, the Owner will want to be very careful to address potential gaps between the contracts, including as relate to contractor responsibilities for work scope, schedule delays and performance and reliability guarantees.

III. The Challenges of Interfacing with Existing Systems

Many of the unique risks and issues presented by re-powering projects result from the fact that key aspects of the work involve physical interface with existing systems, instrumentation and infrastructure on the site. Examples may include cooling water systems, compressed gas systems, steam systems, condenser systems, chemical feed systems, instrument air systems, demineralization systems, reheat systems and waste water treatment systems. With reference to the hypothetical re-powering project described above, such Existing Systems may be in place in support of the prior operation of the Existing STG or other major equipment at the facility. In either case, modifications to the Existing Systems will likely be required to integrate the New Units and HRSGs into the overall facility and to support the future operation of the combined-cycle power island. Even if the re-powering project involves the wholesale replacement of existing generating units, interface with and modifications to Existing Systems will often comprise a key consideration for the project.

Existing System Operational Details

Such required interface gives rise to several issues. As an initial matter, the appropriate contractor(s) will need to engineer the required interfaces with the Existing Systems. In many instances, such engineering will include necessary modifications to the Existing Systems, as well as new equipment additions, as necessary to support the operation of the project (along with continued operation of any other existing generating units at the site). To perform all of this work correctly, the contractor will require accurate data concerning each Existing System's present location, configuration, condition and operational capabilities. This may not always be a simple request. Especially in older facilities, an Owner may not have complete as-built drawings depicting the location and configuration of such systems, or if such drawings exist, may not have complete confidence in their current accuracy. Further difficulties will arise to the extent that such systems are enclosed or underground, and thus not immediately available for visual inspection. The physical condition and/or operational capabilities of such systems may also be in doubt, especially insofar as their ability to support operation of the combined-cycle power island without negatively impacting other facility operations.

Thus, to the extent that complete and accurate data regarding the Existing Systems is unavailable, the contractor will face significant challenges in scoping and performing the interface engineering work. The contractor will also have difficulty providing fixed pricing for such engineering work, a difficulty that will also arise in providing pricing for equipment procurements and in-field construction work relating

to Existing System modifications. Owners and their lenders often prefer fixed pricing or other pricing limits as a matter of budget control. However, any pressure to provide such fixed pricing would basically require the contractor to develop its own estimates and assumptions regarding the Existing Systems, undoubtedly including contingency fees designed to mitigate the risk that their assumptions are proven to be incorrect. In this case, the Owner ends up paying the fees whether the assumptions were correct or not. Such risk issues are not limited to pricing. Lack of accurate data regarding the Existing Systems can also create scheduling uncertainties, potentially leading to the inclusion of excessive float time in the project schedule.

One potential solution to these issues is for the Owner and contractor to develop together a detailed description of the assumed (as applicable) location, configuration, condition and operational capabilities of each of the Existing Systems. The work to develop this information may precede the execution of the primary EPC contract(s), or may be included as part of a "limited notice to proceed" workscope that precedes the commencement of full work on the project. The contractor can then more readily establish fixed pricing and a more realistic project schedule, based upon the express statement that the information is presumed to be accurate. The contract would further provide for change order relief to the extent an Existing System is not located or configured as presumed, or, once accessed, is discovered to require upgrades or proves to be unable to operate in accordance with its presumed operational capabilities. To be clear, this approach does ultimately cause the Owner to bear the risk of unknown aspects of the Existing Systems. However, the Owner has the opportunity to mitigate this risk through data gathering and diligence as would underlie its detailing of the original assumptions. At the same time, this approach avoids the Owner's paying unnecessary contingency fees and being saddled with an extended project schedule, as would otherwise likely be the case were the risk to be entirely borne by the contractor.

Ongoing and Future Operations of Existing Systems

As a contractor proceeds to perform interface and modification work on Existing Systems, additional risks arise. One area of risk involves the ongoing operation of the Existing Systems. In order for work to be performed on an Existing System, the Owner will need to remove it from operation and turn it over to the contractor. Especially if other units at the facility are dependent upon the operation of such an Existing System, this will require highly coordinated scheduling, and presents the risk that delays in the contractor's work will result in delays to the return of other facility units to operation. In some instances, specific schedule deadlines and delay liquidated damages for extended system downtime may be an appropriate contractual means of causing the contractor to bear such risk. Also, if the output of the facility's other units (as rely upon the Existing Systems) are the subject of an offtake agreement, it will be critical to understand what liability risk might be borne by the Owner in the event such units cannot operate due to an Existing System's becoming inoperable for an extended period. An Owner should consider whether this risk can be transferred to the contractor, if it is the cause of the inoperability.

Of equal concern is the risk that the contractor's work on an Existing System, while perhaps not rendering it wholly inoperable, negatively impacts such system's operations such that it can no longer support the ongoing reliable operation of other facility units. In this context, it may be advisable for a contract to expressly document each such system's pre-turnover operational capabilities, so as to provide a baseline for allocating this risk. With such clarity, an Owner may contractually obligate the contractor to return each Existing System in a condition of being demonstrably operable at that baseline level of performance.

IV. Warning: Operating Facility Ahead

Property Damage

Beyond the issues created by interfaces with Existing Systems, there are a number of risks inherent in a contractor's performing work at an operating generating facility. Near the top of the list is the risk that the contractor's personnel will accidentally damage or destroy existing systems or property while working at the site. This risk is of course present for any construction project, but is heightened when the work involves workers, machinery, heavy equipment and even cranes operating in close proximity to operating power generation equipment. In a typical greenfield project, the risk allocation for property damage is fairly straightforward. The contractor is given care, custody and control of the project, and will typically bear most of the risk of property damage, at all times until the project is turned over to the Owner. Backstopping this risk is a "builder's all risk" insurance policy that will cover the costs of repairs. Contrast that with a re-powering project, where care, custody and control of all or part of the existing facility (including the Existing Systems) may only be held by the contractor temporarily, if at all, and where the Owner will already have property insurance in place to cover damage to the existing facility. At the same time, such property insurance will typically not cover new equipment brought to the site by the contractor for the project, especially when such equipment is under the care, custody and control of the contractor.

These two inter-related components of a re-powering project – existing facilities and new equipment - create complex considerations for assigning the risk of loss or damage to the project and allocating responsibilities for insurance coverage. For example, depending on the project, it may be appropriate for the Owner to establish a period during which care, custody and control of certain Existing Systems will expressly transfer to the contractor. During that period, the contractor would bear the risk of damage to the systems on a strict liability basis (i.e., without regard to negligence or fault). An alternative approach would forego a formal passing of care, custody and control, and simply have the contractor bear the risk of damage to any the existing facility (including Existing Systems), but only to the extent the damage is caused by its or its subcontractor's negligence.

In either case, if the contractor's work damages the existing facility, there will be a question as to which party's insurance will cover that damage. The Owner will have its existing property policy in place, but the contractor will also typically carry its own commercial general liability (CGL) policy, which would respond in the event of damage caused by contractor negligence. Thus, the contractor will want the Owner's policy to be "primary" in responding to a loss claim and will typically ask to be listed as an additional insured under that policy, so that it may make claims directly under it. Owners will frequently accept this approach, provided that the Contractor bears the risk of the deductible or self-insured retention (in the context of risk of loss as discussed above). However, this does create the risk of increased premiums being imposed upon the Owner after a contractor-caused event. Other Owners may consider pushing to have the contractor's CGL policy serve as the "primary" policy in the event of contractor negligence, with the Owner's policy responding only once such CGL has reached its limits; however, Contractor will resist having such exposure to their basic CGL policies (which typically apply to risks beyond one project). Another solution may lie in obtaining "adjacent property damage" coverage under the builder's all-risk policy as will normally be in place for the new construction work. Thus, a well-advised Owner will weigh these various options under the circumstances.

As regards the risk of damage to the New Units, the HRSGs and other new equipment, these items will typically remain under the contractor's care, custody and control until project turnover, which usually coincides with the power island' entering commercial operation. It is not uncommon for the contractor to bear the risk of loss of these items during this period, and for one of the parties to maintain a "builder's all risk" policy in place to provide funds for repairs. In this context, the Owner will want to consider the

extent to which it can, through delayed start-up coverage under such policy, recover lost revenues if a damage event delays the unit's commercial operation.

Demolition Activities

Another area of risk inherent in a contractor's performing work at an operating generating facility relates to demolition activities. Frequently, a re-powering project will involve the demolition and removal of unnecessary or abandoned equipment. Unlike a greenfield EPC contract, a re-powering EPC contract must consider and address the risks involved with such work. For example, as a matter of scope, risk and pricing, the contract may need to clarify exactly which items of existing equipment are to be abandoned in place, and which ones are to be demolished and/or removed. To the extent that the removal involves handling any hazardous material (including asbestos abatement and sub-surface soil work), the contract must contain provisions addressing the unique risks involved in these activities, including appropriate indemnities, risks allocation clauses. In this regard, Owners will want to consider requiring such a contractor to have pollution liability insurance in place. This insurance can provide funding for remediation costs stemming from pollution incidents resulting from the contractor's operations (e.g., exacerbation of contaminated soil, the accidental release of fuel oil, chemicals or toxic gases from broken pipelines or fuel tanks, etc.).

Site Security, Environmental, Health and Safety Issues

In a typical greenfield EPC project, the contractor is responsible for creating, implementing and managing programs and systems to maintain site security, and for ensuring compliance with prudent and/or legally required environmental, health and safety (EH&S) standards. However, for a re-powering project, such programs and systems will already be in place for the existing, operating facility. Thus, the issue arises as to whether the contractor must merely abide by the requirements of those programs and systems, under the Owner's management, or whether the contractor should be tasked with more responsibility. For example, depending upon the configuration of the site, it may make sense for the contractor to be fully responsible for the security of stated areas of the site where the re-powering work will be performed. As another example, it may be appropriate for the contractor not only to abide by existing facility EH&S standards, but also to create, implement and manage an additional "layer" of programs and systems that are designed specifically for construction-related risks. Thus, by analyzing its existing security and EH&S programs and systems in the context of major construction work, and understanding the contractor's site work plan, a prudent Owner can determine, and contractually commit the contractor, to the appropriate level of responsibility in these areas.

Sweating the Small Stuff: Other Important Logistical Matters

Just as Achilles might have benefited from focusing more on his minor heel issue, an Owner must not take lightly the potential impacts that even minor logistical issues may have upon the success of re-powering project or upon the ongoing operation of adjacent units. Imagine a scenario where the contractor's delivery trucks arrive at dusk on a Friday afternoon, with the intention of entering the site and immediately unloading cargo into an area that the contractor finds optimal for laydown. The contractor wishes to use an existing on-site forklift that is locked in a storage area, and intends to light the same (for the ensuing evening work) by plugging spotlights into an existing power outlet. A storm is coming in, and some of the cargo is not all-weather packaged, but a nearby storage warehouse appears to have capacity. A well designed re-powering contract will already have thought ahead about these types of scenarios, and will outline the rights and restrictions as relate to issues of site access, site delivery schedules, unloading, and use of Owner equipment and utilities, laydown areas and existing protected storage areas. Thus, by pre-defining these rights and restrictions, each party will know ahead of time what actions are or are not contractually permitted on that Friday afternoon, streamlining actions and reducing the likelihood of disputes.

V. A Complex Step beyond the Greenfield

The engineering, procurement and construction of new power facilities present several complex and challenging contracting issues for any company and their legal counsel. Due to the types of considerations as described above (which only touch upon the tip of the proverbial iceberg), these issues are nearly doubled when the new facilities comprise a re-powering project. They are perhaps doubled again if the project adjoins a facility with ongoing operations. Thus, as companies across the country proceed with re-powering projects, they would be well advised to remember the "one size does not fit all" adage. One should not assume that a "simple" (or even modified) form of greenfield EPC contract will suffice to cover the applicable legal, technical and commercial issues as will be presented by a re-powering project. While such a contract may provide an appropriate starting point, there will be much to consider beyond its original four corners. Such considerations must necessarily focus on the unique physical, technical and commercial aspects of the particular project, with experienced technical, commercial, insurance and legal advisors combining their skills to uncover, identify and address the project's unique issues. Based upon this work, qualified legal counsel can then customize an overall documentation structure, and fine tune contract provisions, so as to help ensure that risks are prudently identified and appropriately allocated.

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