

# **“EXPECTING THE BEST AND PREPARING FOR THE WORST: EARLY NEUTRALIZATION AND CLAIM AVOIDANCE IN DREDGING & MARINE CONSTRUCTION”**

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## **ABSTRACT**

Dredging has unique qualities in the marine construction environment in as much as the owner, design professional, and contractor rely heavily on technology and engineering to determine how best to execute the project, such that the end result is in keeping with the parties' expectations and the project is considered successful by all parties of interest. In fact many dredging and marine construction projects offer unique challenges in contrast to most conventional terrestrial construction as data acquisition, interpolation and natural phenomena create conditions that many times affect the project and its success. Disputes may, and often do, arise from conception through construction completion. The methods, manner and dynamics of how the parties interact in the dispute process is critical to the overall outcome of the project both from a performance and financial aspect. This subject is to be explored by comparing and contrasting two projects (although based in fact, the projects and parties have been masked), each with issues that arose during construction and exploring how these components interplay with one another. Each case will provide a brief synopsis of the facts, then a discussion of the issues and finally within each case methods that may be engaged to strengthen positions, and come to a final strategy on the best alternatives.

**Keywords:** Dredging Claims, Defective Design, Sub-Contractor Claims, Project Scheduling, Dispute Resolution.

## **INTRODUCTION**

The one overwhelming theme that echoes in the minds of contractors and owners alike; is how to finish a project on time, within budget and with a minimal amount of controversy, or in simple terms the preverbal “win-win” scenario. It is impossible to gauge how many projects are completed with a “win-win” final score, but as most seasoned construction professionals and owners are aware the percentage is low. As such, each party prepares for differences in many different ways. The planning, execution and relationships of all of the parties will steer the project and this becomes increasingly important in strategizing and handling construction disputes, particularly in a marine environment. The interplay as well as the increasingly complex methods of construction, specifications and plans along with stringent environmental concerns and constraints continues to raise the challenges of both design and construction. While in many owner/contractor minds, disputes are an all too prevalent part of business and the construction process, experience dictates that both parties have to live with the reality that disputes will arise and in turn have to be dealt with. The basic facts are that the untold costs of tied up capital on the part of the contractor, strained relationships with owners and the distraction of posturing in a dispute environment can have a dramatic effect on the overall project operations. Typically a contractor must rely on field management to prepare and properly document a claim as an “add on” to their normal duties, this commonly leads to a distraction and loss of focus on the project. Meanwhile, the owner is burdened with a project that is likely falling behind schedule, diverting available project management resources to play defense as well as offense to claims of the contractor. The following presents two projects that bring to light issues that arose during marine construction and dredging activities with the desire to outline what steps could have been taken in an effort to reach equitable results for the owner and contractor in the dispute resolution process.

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## **What is a Claim?**

### **Federal Projects**

Claim means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to the contract. However, a written demand or written assertion by the contractor seeking the payment of money exceeding \$100,000 is not a claim under the Contract Disputes Act of 1978 until certified as required by the Act. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim. The submission may be converted to a claim, by written notice to the contracting officer as provided in 33.206(a), if it is disputed either as to liability or amount or is not acted upon in a reasonable time. **(48 CFR PART 2, 2.101 Definitions.)**

### **Examples on other Projects**

A claim as defined in Subparagraph 4.3.1 of AIA Document A201. Subparagraph 4.3.1 provides that:

A Claim is a demand of assertion by one of the parties seeking as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract.

### **Case One: Alpha Construction and Dredging Company, Cleveland, Ohio**

#### **Background**

The contractor was awarded a thirty million dollar construction project in St. Thomas, U.S.V.I. A major component of the project was the removal of approximately two million cubic yards of hard and soft material with disposal in an offshore disposal site. This work was adjacent to other projects in this multi-phased project. Alpha's bid on the dredging component of the project was significantly lower than the other bidders on the project.

A solicitation took place and the project was procured and was planned to be built in two phases. Both phases consisted of about one mile of river improvement dredging, each with about 2,000,000 cubic yard of dredging. As in many improvement projects there were a number of existing structures along the alignment to be modified, Phase One required that an existing bridge be upgraded to deal with the new wider and deeper channel. This bridge was located near the mouth of the river, and consisted of an existing center navigation span about 100 feet in width, and several approach spans averaging about 60 feet each. The position of the bridge was such that almost all of the 4,000,000 cubic yards of dredging had to be towed to sea for disposal by passing under the bridge, and traversing under the 100 foot navigation span. In addition there was a major sewer pipeline crossings on each contract; each had to be replaced by a new sub-aqueous sewer line installed at a deeper elevation. Since this was an urban area, each sewer line was operating at near 100% capacity, and the contracts required this replacement be accomplished without disrupting flow. The local soil conditions were classic outwash alluvial plains, with nearby mountains that produced significant water run-off after storm events. Soil conditions were predominantly silt of variable density, interlaced with lenses of sand. Underlying rock formations for pile foundations were over 100 feet below the ground surface.

The Phase One contract was awarded to Contractor Beta, who was a local contractor and had many years of experience performing earthwork contracts in and near the project. Beta was the lowest of four bidders on the project, and the award and notice to proceed was given in September of 1995. Very shortly after the notice to proceed the state highway department requested that the owner consider partnering the cost of the bridge work and allowing them to perform seismic upgrades on the bridge as part of the flood control project. In order to expedite the program it was decided to perform the bridge upgrade as a Design Build amendment to the Phase One contract. Preliminary planning seemed to indicate that the work could be completed before the planned start of the Phase Two work, and that the final bridge design would not impede the barging operations for the second half of the four million cubic yards of dredging.

The Phase Two project was advertised in July 1998, and bids were opened at the end of August 1998. The low bidder this time was Alpha Construction, a contractor from the mid-western US, who had never performed a contract in this part of the country. A bid protest delayed the award by several months, but ultimately Alpha was successful, and received a Notice to Proceed in March 1999. Construction work started on Phase Two shortly thereafter. Preliminary work of building retaining walls and relocating the trunk sewer had to be accomplished (mostly in upland conditions), before dredging could begin. This required almost two years, and reached a point of substantial completion by January 2001. As the work was done mostly in dry upland conditions there was little reason for Alpha, the Phase Two contractor to coordinate activities with Beta, the Phase One contractor. As an unusual circumstance, for some unknown reason, during the two year period preceding Alpha's commencements of dredging there were never any work coordination meetings held with all three parties present.

Up to the Summer of 2000, the time when Alpha began plans for dredge mobilization, Alpha's staff had no reason to expect the Phase One was not proceeding on schedule, nor was there any reason to suspect that there might have been a problem with shoaling in the Phase One Channel. The final design of Phase One was such that when completed most of the channel was 300 feet wide and at least 16 feet deep, with no known obstructions. Alpha obtained post dredge surveys of Phase One from the Owner to assure themselves that the channel was indeed dredged to the planned depths. The channel design in Phase Two was not as forgiving as Phase One, in that it is somewhat narrower and shallower. Contract plans and specifications along with Coast Guard regulations required that the dredge spoils be transported to the Ocean disposal site onboard ABS certified bottom dump scows. However, the narrower and shallower Phase two design conditions made it difficult for large, commercially available scows to access the upper reaches of the site. To accomplish its dredging effectively, Alpha attempted to seek out narrow beam shallow draft scows that met the ABS certification requirement. This became an arduous task, as scows of this description had become a rare item on the rental and lease market. In the end, Alpha was unable to rent scows for the project, and ultimately purchased them specifically for this project, with the expectation that at the end of the project they could sell them and thus stay within their rental budget originally contemplated. Alpha prepared the dredge and scows for the mobilization to the project, towing commenced in January 2001, with expected arrival date of March 1. It was at this point the many seeming insignificant problems surfaced very rapidly, that ultimately set the project back significantly.

Work on the Phase Two project had up to this point proceeded fairly well with only a few problems, all of which had been resolved. However, in December 2000 one of Alpha's work barges unexpectedly ran aground near the center of the Phase One channel, in an area that was shown on plans as over twenty feet deep. This prompted a series of inquiries by Alpha, requesting that the owner investigate the problem. The owner promptly responded that the issue was an "access" problem and that the problem was Alpha's to investigate and work out. Alpha responded, and pro-actively contracted with a hydrographic surveyor to perform a condition survey of the channel. This took a few weeks to accomplish, and by the time the survey was finalized, the dump scows had nearly reached the project site. When the new survey arrived, it showed that significant shoaling had occurred in the two year period that had lapsed since the Notice to Proceed. To compound problems, Alpha also learned that the bridge renovation at the mouth of the river was significantly behind schedule, and that construction activities were just starting that would be blocking the navigation channel for several months. Faced with an obvious dispute, after a number of meetings it was determined that the Phase Two contract could not be completed as it had been intended, and the owner made the decision to terminate the contract for its convenience. Alpha, brought its operations to a close and demobilized from the site.

Alpha procured, mobilized equipment and manpower for the dredging at a considerable expense. Alpha also purchased, specifically for this project, equipment to accommodate what was shown on plans as controlling depths and access points to the project site. Once Alpha was on site they determined that the failure of another contractor on an adjacent project to complete work made access (via water) nearly impossible. The plans and specifications showed this work as being complete. The owner maintained that access to the project site at all times remains the responsibility of the contractor and he should have known about access into his own project site.

### **Case Two: Beta Dredging, Everett, Washington**

Case two evolved around an improvement dredging project. A significant portion of the project work area was covered by a variable layer of contaminated sediment. Most of the contaminated sediment only required special handling and encapsulated disposal, but some was significantly contaminated and required handling as a RCRA contaminated waste, which meant it had to be brought ashore and taken to a remote holding area for subsequent disposal by the Owner. There were many environmental concerns surrounding this portion of the project, but the biggest concern was containment of turbidity. The Owner had spent years developing a workable permit plan, working through the issues brought on by local residents, fish and wildlife agencies, environmental activists and the local fishing interests. The project was made even more difficult because access into the nearest shores with barges was hampered by very shallow water, improved only slightly by a four foot tidal range. In addition to the dredge turbidity issues, there were serious concerns that tow boats, attempting to maneuver barges near shore, even at high tide, would create large plumes of suspended sediment. It was feared that this would in turn spread the contamination beyond its present limits or into the newly remediated areas. Because of these potential problems the Owner researched several new and innovative methods for performing this portion of the dredging, hoping to find a way to minimize disturbance of the immediate area being dredged, as well as the transport route to the shore for its treatment and disposition. Hydraulic dredging and filter press dewatering seemed the most viable option, however analytical testing had also revealed that the discharge of excess water back into the waterway was not possible without extensive pretreatment to remove the contaminated suspended solids. A number of viable new technologies in the developmental stage had been presented to the Owner that minimized the addition of water as part of the transport process; however few of these had been tested outside of very controlled conditions. Over the ten year course of permitting and design, the design team was hopeful that one or more of these technologies would develop into a reliable, cost-effective solution by the time the project was ready for bidding.

Of the \$25,000,000 project value, the anticipated cost of managing the contaminated sediment was about \$5,000,000. Because of the relatively high project value and the associated risks, only a few bidders were expected. When the project was finally ready for bidding, a number of dredging and marine contractors showed serious interest, but complicating matters, the proponents of two of the most promising “environmental dredging” technologies had dropped their interest citing excessive development costs. This, in reality left the project with the dilemma of relying on the use of untried innovative new technology, or “tried and true” conventional technology (Hydraulic Dredging, Dewatering, and Effluent Treatment), which would escalate costs potentially beyond available funding.

When the Bids were opened, Alpha Construction, Marine Contractor was low bidder, and by a considerable margin. On inspecting the bid abstracts it was evident that much of the difference between Alpha and the second and third bidder was in the unit price for dredging of contaminated sediment. Alpha was asked by the Owner to confirm its bid and submit additional qualification information regarding its experience with dredging of contaminated sediments. This was also followed by formal protests from the second and third bidders, however these were dropped after a few months. Alpha responded to the Owners request for additional information, and sent along a list of four projects that it had completed involving handling of RCRA materials. This satisfied the Owner, and although they were still concerned about the low unit price for handling the contaminated materials they proceeded with Award and Notice to Proceed.

The project had a very tight completion timeline, which was aggravated by delays in the award process. Alpha had planned to subcontract the removal of contaminated sediment to “Gamma” a smaller dredging company that had developed a model for dredging and pumping sediment while adding very little water as part of its process.

Unfortunately, this method had only been tested on a production basis in a freshwater environment where the in-situ sediment had a much higher water content. The subcontractor was confident that he could overcome this difference, so much so that he supplied a performance bond for his work.

Alpha began its production dredging in an area where there was no contaminated sediment, with the intention of working around the subcontractor and allowing time for completion of that portion of the work, which was anticipated to take several months. Alpha also built the contaminated sediment handling facilities on shore, which required about four months to complete and were completed on time. Gamma mobilized within this timeframe, and was prepared to start work close to the planned schedule; this is where the troubles began. Gamma began its dredging operations near shore where it felt it could work out any technical problems with less difficulty. However, in the area where they started dredging they immediately found only a few inches of silt covering, several feet of silt mixed with broken concrete and steel debris. This caused untold problems, as the hard materials and debris were jamming the dredge pump and causing constant breakdowns. A number of solutions were attempted, such as trash screens and pre-digging to remove the debris; none of these methods worked effectively. A few months of virtually no production ensued, plagued with breakdowns and shut downs awaiting parts. Gamma finally convinced both Alpha and the Owner that their methodology was good, but the conditions were too difficult for their equipment, and requested moving to another area of the project to work. Being a small contractor, and having expended significant funds on the project with virtually no income other than their mobilization costs, Gamma was starting to feel financial pressure. When they moved further from shore they found working conditions better but problems persisted. Unlike the light homogeneous silt they had dredged on their freshwater projects, they found the riverine mud to be much heavier and of non-uniform consistency. Further, because the area had been a fishing port for many years and an anchorage for commercial boating, thus they again consistently encountered debris in the form of old nets, trawling gear and the like. When they were not shut down dealing with debris, the heavier mud, interdispersed with sand and pockets of clay proved difficult for gamma's equipment at best, causing numerous system clogs that took days to clear. Gamma, attempted to continue dredging, even though production was only a fraction of that which was anticipated. It wasn't long before this phase of the work was seriously behind schedule, and it was obvious to all parties that there was little chance for recovery. The Owner's representative began writing strong letters to Alpha, advising them that they felt the project was behind schedule, and wanting to know what Alpha would be doing to correct the problem.

Alpha meanwhile was proceeding on its schedule; they had been working at full production since the outset of the project, nearly nine months, and they were encroaching on Gamma's incomplete work area. They were well aware that Gamma was having production problems, and in anticipation that Gamma would default were seeking alternative completion methods. Unfortunately, they were learning what the second and third bidders had taken into account in their higher bids. There were no real alternative methods other than hydraulic dredging, and dewatering, then treating the effluent, or bucket dredging which on this project would bring on a litany of turbidity issues because of the shallow water access. The closest alternative method they could conceive of overran their budget by \$3,000,000, plus any money that they had already fronted Gamma's operation. When Alpha received their first formal notice from the Owner, and it was becoming readily apparent that Gamma was experiencing severe financial difficulties because of this project, Alpha reluctantly notified Gamma's bonding company of the potential default.

Alpha had brought Gamma to every production meeting since the beginning of the project, where the difficulties and production were openly discussed. However, they had been slow in putting the owner on written notice of any changed conditions. Gamma, being a small company and weak on contract dispute procedures had also not formalized any potential claims up to that point.

At the same time Alpha notified Gamma's surety of potential default, they also put the owner on formal notice of the debris problems they had been encountering, which they called a "differing site condition". As justification for their claim, Alpha cited that none of the concrete or debris was shown on any the test borings, and that this was forcing them to significantly modify their construction procedures, at substantial additional cost. Gamma's surety also sent a consultant to the project to make an independent analysis, and he in turn advised Gamma that if the Surety were to take over the project, that they might consider a similar claim against Alpha.

The Owner responded to Alpha's notice denying the claim, citing several reasons. First: Gamma's construction methodology was not appropriate for the conditions. The equipment being employed by Gamma was not sufficiently powerful to meet the task, and they had never come close to their projected production even when they were not

slowed by the debris issues. Secondly: the project specifications required that the contractor make reasonable site inspections to determine the character of the work. Alpha would need to document the extent of the site inspections they had made prior to bidding the project, and show proof that the conditions they encountered differed from what the site inspection showed. Thirdly: They also noted that none of the borings shown on the contract documents were situated in the areas where Gamma had been digging, thus there had been no representation made by the Owner in those areas. Thus no “differing” condition existed in actuality. Finally: Alpha had failed to comply with the notice requirements of the contract documents, waiting several months before providing the required written notice. (Alpha refuted this final reason for denial immediately – citing that the Owner’s representative had been at every project meeting and was fully aware of the conditions that had been encountered).

Alpha ended up defaulting Gamma, which forced them into bankruptcy, and they in turn submitted a voluntary default to their surety. The Surety made an agreement with Alpha and a dewatering subcontractor to complete Gamma’s work using a hydraulic dredging, dewatering, effluent treatment method. The project overran the projected schedule by a year, causing Alpha a shut-down of several months awaiting access to Gamma’s site. The Surety’s costs overran recovery by \$5,000,000, for which they in turn sued Alpha, citing several causes including Type 1 and 2 differing site conditions, owner’s withholding of superior knowledge, and practical impossibility of performance. Alpha in turn submitted a claim against the owner basically mirroring the surety’s claim. Since Alpha had been shut down for several months, they had incurred significant costs because of idled equipment, including two rental dump scows at \$80,000 per month. Alpha in turn sued both the Surety and the Owner for these Costs. Meanwhile, the owner’s client – the Local Port Authority had lost several months of use of the new deepwater access to their facility, and as a consequence had lost a valuable shipping contract. For this reason, the Owner would not reduce \$1,500,000 in liquidated damages (300 days at \$5000 per day). The conclusion, there were no winners in this case except the attorneys.

### **Discussion**

There are quite literally thousands of cases that involve cases with respect to contract disputes arising from “differing site conditions”, “loss of access”, “changed site conditions”, “owner’s superior knowledge”, and the like, wherein the owner and contractor each had different expectations of what might be encountered at a particular project site. For example, fixed price contracts with the Federal Government are designed by regulation to describe a fixed body of work (within reasonable parameters) to be accomplished, as described by the Contract Documents. To further elaborate, if a contractor is to build a school, plans can and are usually quite specific as to the size of the building, the number of stories, number and dimensions of rooms, the number of doors and windows. These items are of a type that are usually easy to describe in minute detail, because everything is new and planned. Typically, the only area on such a project where there is the potential for error is site-work and foundation work, and while there are disputes that arise in other parts of such a project, they usually involve controllable changes in the design that occur during the prosecution of the work. As an example one might expect to see a change order wherein the owner might want to add or delete a classroom or small wing, or change the type of roofing material. But one would not routinely expect the owner to contract for a ten story building, then inadvertently discover that they only needed a building of three stories.

This condition does not however hold true for contracts involving construction underground or in dredging. Historically, the largest majority of contract disputes arise from projects that are either underground (or underwater) or rely on underground conditions (i.e. pile foundations or highways). This is because the majority of the site is hidden from easy access, either underground, or underwater. Thus under current regulations if a Federal Government agency (as well as many State and Municipal agencies) has a need to procure services under a fixed price contract (versus “cost plus” or cost reimbursable plus fee), a method needs to be employed that allows for reasonable definition of the intended work to be performed. The definition of a heavy earthwork, highway, tunneling, deep foundation and dredging project typically must include a description of both the quantity of earthwork, and general description of the soils and conditions a contractor should expect to encounter, as well as the general methods the owner deems acceptable for accomplishment of the work.

As part of the difficult process of defining a dredging or dredging dependent contract that satisfies the owner's requirements a designer has little choice but to default to the standard used for the past hundred or so years, which is a combination of hydrographic surveys, and test borings. Until some more precise method of underground definition is discovered, by default these two methods must remain the cornerstones of determining the extent and difficulty of a dredging project. In a similar vein, no two disciplines have borne more criticism when the conditions described by their data turn out to be less than perfect. It should be no surprise that over the course of generations of disputes, over billions of dollars that each party (owner and contractor) have established strategies to defend their positions when less than perfectly described conditions are encountered. This is further complicated by difficult or unusual site conditions where the project seems to have a life of its own, or soils that do not act as they normally do (as in "Type 2" differing site conditions).

Ideally, owners would like to be held totally harmless from any preliminary investigations they make in the course of designing a project; and the contractors should have the ability to survey and bore every project they bid on an extraordinarily tight grid, so that there should be absolutely no doubt in their minds as to what they might encounter. Conversely, contractors want definition of a project by the owner to a standard that approaches x-ray vision and astrology (in lieu of geology). Many attempts have been made on the part of both Government and Industry to resolve this conundrum; none to date have made a recognizable improvement.

In case one, the owner was remiss by not including the Phase two contractor early on in Phase One project coordination meetings. And although some of the conditions that ultimately terminated the project were clearly unusual, much of the problem may have been worked out had Alpha been include in coordination efforts earlier. As it was Alpha was terminated for the owner's convenience relieving him of performance on the remainder of the work to be completed. From the contractors prospective they averted serious problems closing out the project because they were meticulous in their documentation of the site conditions. More importantly, they sought and received expert advice on the most advantageous methods for preparing the case and presenting the costs to auditors.

In case two, there were no winners, and the case drug on through the court system for many years, ultimately settling. This second case is all too common, and clearly demonstrated several common over-sites on the contractors part that cost all parties dearly. Because of the risks involved in the project, and the port's history of heavy commercial use, Alpha should have been alert for potential debris issues. The cost searching out and performing diligent pre-bid site investigation would have saved him untold grief. The Owner in this case was equally at fault, they had spent years on the site and had performed hundreds of borings, surely someone should have run across and logged such conditions in that time period. The failure of Gamma's equipment was also preventable; it may have been more advisable to conduct a prequalification pilot program in advance to determine what methods would work and which wouldn't. A high risk, closely monitored, tight completion timeframe project is no place to be experimenting with untested technology. When all of this fails, and a project begins experiencing problems, planning and communication are the best tools for working out problems before they become too enormous to deal with. In other cases, when the parties get totally stuck, it may be advisable to bring in a neutral third party to attempt to work out a settlement, or cost mitigated solution.

As in any claim situation it is imperative to follow some basic rules for avoiding claims and if necessary presentation of claims to the owner;

### **Conclusions**

1. Provide and support experienced field personnel and management that are familiar with the work to be undertaken. If a problem can be resolved at field level (even if the costs seem unmanageable at the time), this is usually the most cost effective solution. By comparison, the cost of litigation and the delays and problems that accompany litigation can exceed these first "out of pocket" costs for both parties by orders of magnitude.

2. Use technology to your advantage. In case one, the home office of the contractor was over two thousand miles away. A project web site was created to keep the home office up to date with photos, documents and correspondence. Upper management was able to strategize and maintain focus on other projects and build a vast library of information. They were also able to more easily solicit opinions from third party consultants as problems arose, eliminating a number of costly field trips.
3. Have a reliable cost system in place that clearly segregates costs appropriately. In Case 1 the contractor was able to recover post termination costs, however the documentation and substantiation was critical to the allowability of the costs aside from general project costs segregated on the contractor's books. In this situation, the contractor segregated the costs on his books regarding each issue that he felt warranted discussions with the owner.
4. Clearly define the issues up front. The contractor in Case 1 clearly was unable to perform on the project and alerted the owner that significant costs would be incurred as a result of stand-by time. This notification allowed the owner the opportunity to address their needs and ultimately decided that it was more in their best interest to terminate that portion of the work that was affected by the differing site condition, than to hold the contractor over and potentially face a battle for sometime on fault and monetary damages.
5. The documentation of what is transpiring on the site is critical in preserving claims and rights and will enable both parties to negotiate on a more level playing field. Clearly in Case Two, the contractor failed to document contemporaneously on the issues that were being encountered. It becomes increasingly important to address the issues when they arise and not leaving issues until the project is faltering.
6. Hire experts early on. The preservation and documentation of site conditions and issues that are occurring on the site will enable both the owner and the contractor to deal with these issues in a more timely and hopefully more analytical approach. If the owner and contractor can agree to one expert in a cost sharing arrangement, the information obtained can be fruitful in negotiating claims early on without setting lines or posturing by groups of experts. In any event, both owners and contractors alike should recognize the need to have independent, third party verification and substantiation of the claims they each are setting forth.
7. Address the entire project as a whole early on. As in Case One and Case Two both contractors had critical path items that ran into problems well into construction. Both the owner and the contractor need to review the project schedules, provide as much documentation and information as possible to enable both to coordinate activities and identify potential problems along the critical path, no matter how small, early on to facilitate communication and issue recognition early on.

As with any construction project the planning, preparation and execution of the project as a whole is critical. Owners, designers and construction professionals each need to be diligent and seek creative ways to handle issues as they arise. When expectations are high and the risks inherent as they are in marine construction, it is prudent to have strategies and plans in place for dealing with risks and problems before they occur.