

*Part 1 of a 2-Part Article*

# Sharing Risks for New Energy/Efficiency Projects

*Christopher Kane, P.E., Esq.  
Associate General Counsel  
Raytheon Engineers and  
Constructors, Inc.*

*George W. Stiffler, Esq.  
Bastianelli, Brown, Touhey and Kelley  
(Washington Office)*

---

**Editor's Note:** New Energy/Efficiency Projects (EEP) have all the normal risks associated with power and energy projects—and more. In addition, the risks involved with developing energy technologies must be assessed and allocated.

The increased risks associated with delivery of these technologies, however, are offset by significant benefits which include reduced environmental impacts, combined with improved generation and utilization efficiencies. In order to achieve these benefits, project risks need to be allocated appropriately and managed in order for projects to be financed, built and operated successfully.

The two-part series—by authors Kane and Stiffler will address some practical risk allocation guidelines and mitigation strategies for overcoming financial challenges and insuring energy project success.

---

A systematic approach to risk management for financing and project development begins with a realistic risk allocation during the initiation of the various contracts. Realistic risk allocation involves an equitable sharing of risk rather than a blind allocation. During the preconstruction development phase, the owners and the other project

participants should determine the optimum risk distribution, the overall form for the contracting arrangements and the team building requirements for their particular project. The team building approach helps manage risk and reduce conflict.

The focus throughout must be on appropriate "risk sharing" by all the stakeholders in the project. This would include developers, investors, contractors, designers, equipment suppliers, fuel suppliers, operators, consumers and government entities. As discussed below, risk sharing involves allocating risks to the party who is in the best position to control them. Thus each stakeholder in the project maintains some extent of control over its destiny. A number of contractual relationships will ultimately describe the precise risk allocation among the stakeholders. (See Figure 1.)

#### ADVANTAGES OF RISK SHARING OVER RISK SHIFTING IN CONTRACTS

The development of any major project involves substantial risks; risks in the necessary approvals, design, time, cost, quality, performance and the potential revenue stream and utilization of the project. In the past, parties to the process frequently focused on "risk shifting" and "risk avoidance." This aversion to taking responsibility is both a product of and contributing factor to the litigious nature of the industry. To avoid litigation and disputes, the focus must be on "risk sharing."

Industry studies indicate that contracts which attempt to shift risks to parties which have little or no control are not cost effective. These risk shifting contracts are ineffective because they: (1) reduce contractor competition, (2) increase prices due to increased contractor contingencies, and (3) increase costs and reduce efficiency due to increased project disputes. These studies have concluded that the imposition on contractors of risks which they cannot manage and control is a *primary* cause of contract disputes.

Among other things, risk shifting clauses tend to create an adversarial relationship from the very start of a project. Walls are built rather than bridges, and the chance of a legal conflict increases greatly. In contrast, when risks are shared equitably, the need to operate defensively is eliminated and the chance of conflict is greatly reduced. When the parties share the risk, their working relationship becomes more cooperative and less adversarial.

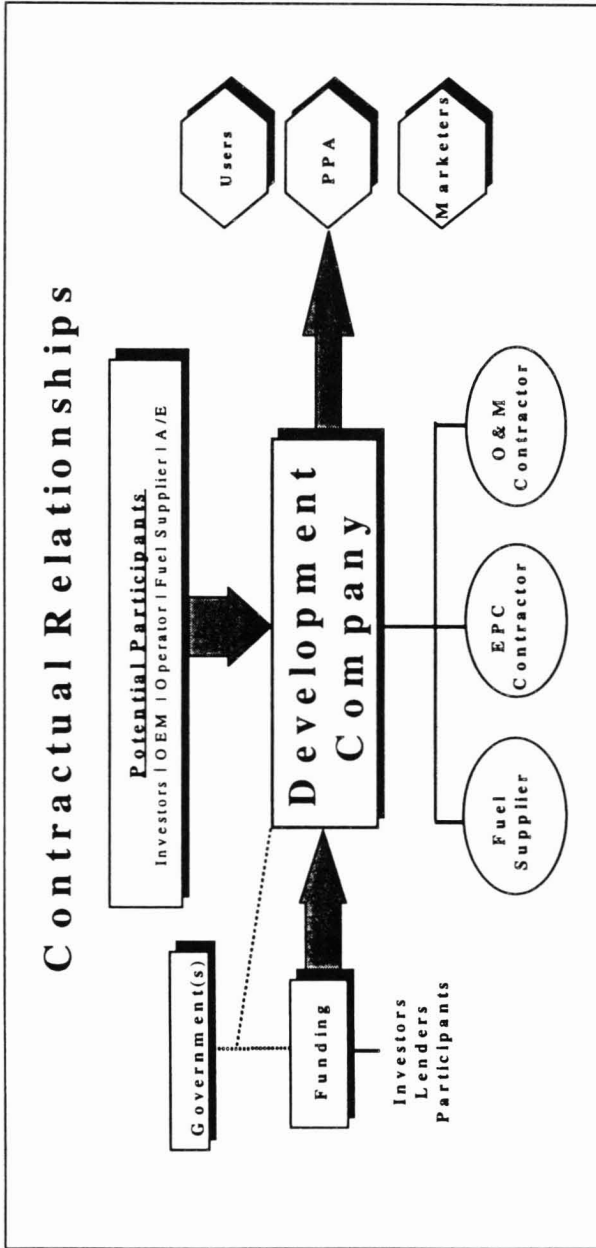


Figure 1

## ALLOCATING PROJECT RISK IN STAGES

Project risk can be divided into three stages: (1) development, (2) design and construction, and (3) operation and maintenance (See Figure 2). In many situations, a plan of finance targeted for each stage will often minimize costs. Each stage can be tailored individually to the unique interests of different contractors and investors seeking different investment risk/return trade-offs. Establishing a financing and contracting plan for each stage helps to avoid a "high risk" profile for an entire project.

- 1.) *Development Stage.* The development stage is the phase where preliminary project design, planning, cost estimation, environmental impact assessment, permitting, and right-of way acquisitions occur. Because this phase has the greatest uncertainties and financing risks, it is viewed by capital markets as highly speculative. As a result, the developer often has difficulty in securing financing for preconstruction expenditures. When the developer does obtain financing, it generally is at a higher interest rate than would be charged for financing the later stages of the project. Frequently, potential participants provide services at risk during this stage, until financial closing.
- 2.) *Design and Construction Stage.* The construction stage also has financing risk, although the risks may be more definable. The financing risks exist for various reasons, including the possibility of construction difficulties, unforeseen circumstances, delays and overruns. While interest rates on construction financing are lower than on preconstruction financing, rates can be high due to the length of time that investor capital will be tied up. However, by choosing the proper contract delivery approach, which guarantees the maximum cost, provides for fast track delivery and allows for liquidated damages for delay and preferences, the risks can be mitigated. A highly qualified contractor team also controls the risk at this stage.
- 3.) *Operation and Maintenance Stage.* The operational stage has the least financing risks, although other risks do exist. The major risk of this stage is whether the developer will generate sufficient income from

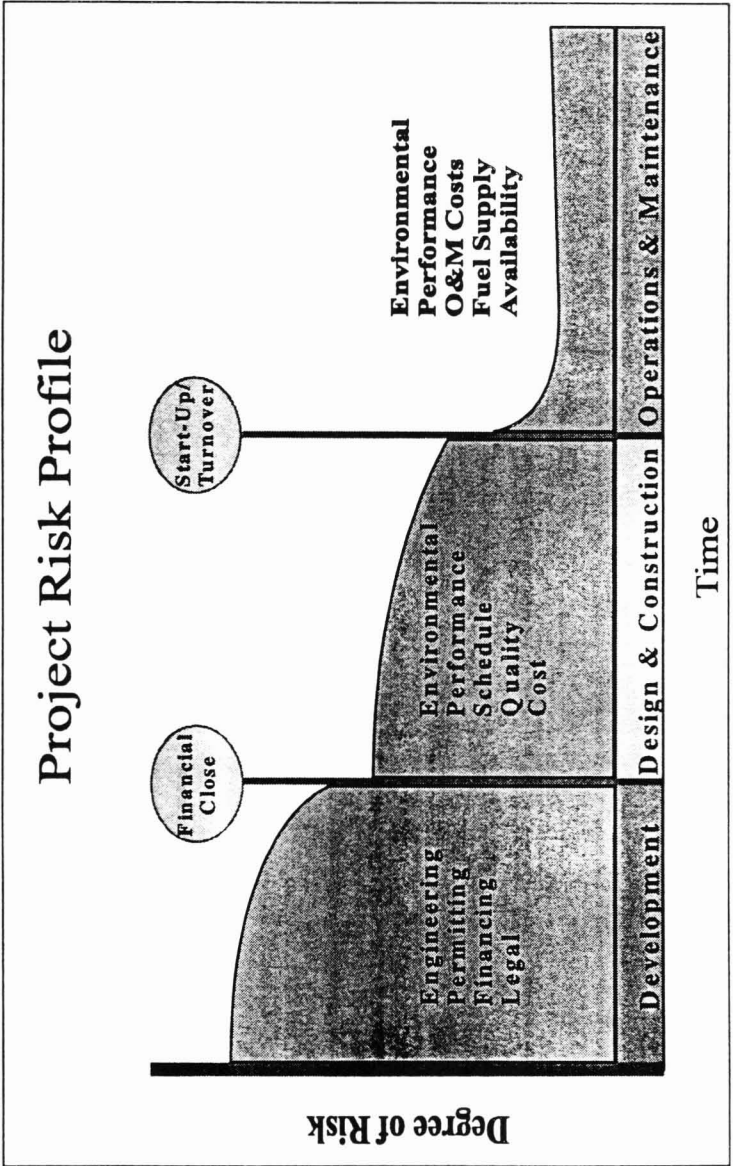


Figure 2

the project to repay the principal and debt and achieve a return on its investment. On the cost side, there is ongoing risk in fuel, operation and maintenance and plant performance.

## IDENTIFYING PROJECT RISKS FOR ALLOCATION

Before risks can be reasonably allocated they must be identified. The effort in identifying, quantifying and assigning risks prior to and during contract negotiations is critical to project success. Figure 3 provides a process risk overview. The following is a general discussion of some of the major risk areas in the process that should be addressed.

1. *Regulatory Risk.* Regulatory risk is that arising from the need to satisfy requirements expressed in laws or regulations. Typical regulatory requirements involve taxes, health and safety measures, and environmental considerations such as limitations on discharges and emissions. Many regulatory requirements are reflected in the need to obtain permits or other governmental imprimaturs. The costs imposed by meeting regulations in effect at the time the particular contract is entered into are more or less quantifiable and can be reflected in the contract and the price depending on which party is assuming the risk. The regulatory requirements may change, however, between the time of contracting and completion. Accordingly, the contract should identify at what point compliance with regulatory mandates is to be measured (e.g., substantial completion), and allocate the risk of any subsequent changes accordingly.
2. *Governmental Risk.* Governmental risk refers to the possibility that the country or other geopolitical entity in which the project is to be constructed and operated will undergo a political, economic, or social change that impacts the project after it is started. Such risk is most prevalent in developing countries. Examples include wholesale changes in governments, expropriation, anarchy, warfare, terrorism, sabotage, and currency problems (e.g., devaluation, exchange rate fluctuations, and convertibility controls). Such factors may affect any or all of the project stakeholders' desire or ability to continue with the project.

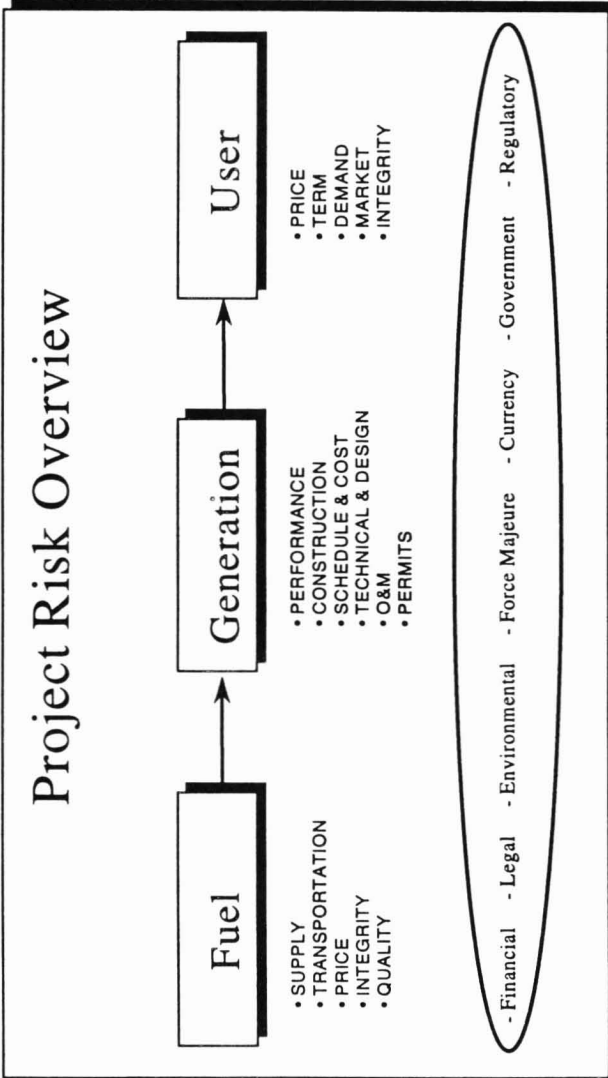


Figure 3

3. *Fuel Risk.* Fuel risk refers to the availability, price and quality of fuel to fire the plant. The risk is that a shortage of acceptable fuel will increase the price to a point where continued operations become uneconomic. The risk of fuel price and availability will be allocated among the owner, operator and user. In some instances, one or the other party will assume the risk to a certain point, at which point it will be shared or shift entirely. Where a party other than the plant operator is to assure fuel availability, there may be a "put-or-pay" agreement where the party assuming the risk guarantees the availability of a certain quantity and quality of fuel. If unable to deliver the agreed fuel, the party at risk must pay the operator a predetermined sum. Where there is a power purchase agreement that commits a customer to a specified buy, often fuel costs are indexed or passed through to the customer, so that it bears the risk of fuel escalation.
4. *Market Risk.* Market risk addresses whether there will be a sufficient customer base to absorb the output of the plant to (a) justify the investment in the plant's construction and (b) permit its continued operation. In an era of deregulation, market risk must consider the effect of competition in the intended market, including the need for lower prices to meet that competition. Market risk is especially important where project financing is to be employed, i.e., financing is based on projected revenues. Market risk may be difficult to assess because it is based on projections of future demand as well as price.
5. *Construction Risk.* Construction risk includes the risk of whether the project can be completed on time, or for the agreed price. Construction risk also addresses whether the plant will perform as promised. Numerous factors may impact the construction process. These include design deficiencies, owner changes, differing site conditions, weather, labor problems (e.g., strikes or skilled labor shortages), material and equipment availability, health and safety concerns, currency fluctuations, the availability of necessary utilities, and the regulatory and governmental risks discussed above.
6. *Performance/Operating Risk.* Performance/operating risk refers to operation of the completed plant, and usually falls upon the opera-

tions and maintenance (“O&M”) contractor. Once presented with a set of assumptions as to the capability of the plant to be constructed, the O&M contractor may be required to guarantee a certain output level. Any shortfall will result in a reduction of the contract price. At some point, the shortfall will be so great as to justify termination of the O&M contractor. Factors impacting performance/operating risk include some of the elements of the other risk factors, including regulatory, governmental, changes in the operations, fuel risks, market risks, labor problems, currency fluctuations, and the availability of utilities. Compliance with environmental concerns also is a significant risk in performance/operations.

7. *Technology Risk.* Technology risk refers to the possibility that the technology/methodology used to produce power will not perform as anticipated. This risk will encompass the spectrum from complete failure (in the case of new, innovative, or unproven technologies) to less-than-anticipated results (where technology has been used with varying degrees of success) to relative certainty of success (where proven technologies are employed). Depending on where the technology employed falls on this spectrum, the greater or lesser the risk that will have to be allocated among the parties.
8. *Force Majeure Risk.* *Force majeure* risk means a risk that is beyond the control of all parties to the contract, most typically in the nature of acts of God and unusually severe weather. In contracts it can also be defined to include such things as strikes at a manufacturing site and delays in transportation. Often a *force majeure* clause is used that will excuse any party’s performance in the face of occurrences (including governmental risks) beyond any party’s control.

## BUILDING TEAMS TO FACILITATE RISK SHARING

Risk sharing involving the development stage can be spelled out in a memorandum of understanding and later structured as a consortium or joint venture agreement. Ultimately a special purpose entity may be used. These agreements must address the sharing of risks and rewards among the participants for the development effort. The construction

stage typically involves two contract delivery systems; either a construction management, multiple prime arrangement or a design-build type agreement. Variations in the importance of the risk factors affect the initial contracting choice. Power projects frequently use a design-build or EPC (Engineer, Procure, Construct) approach to attract financing and control risks. These various agreements are described below.

1. *Teaming Agreements.* A teaming agreement has two or more entities joining on the basis of obtaining projects. In a teaming agreement, typically the prime contractor will agree to use a particular subcontractor, the other team member. In return, the subcontractor agrees not to team with others on the project and not to bid itself as a prime. Although a teaming agreement usually establishes a prime-subcontractor relationship, it may also be a joint venture.

The relationship between the parties is expressed in a teaming agreement. The parties to the teaming agreement remain free to sell their services to others not involved in the project. In an exclusive arrangement, the prime contractor may want to place controls on how much the teaming agreement subcontractor can charge since the subcontractor will be a sole source. A teaming agreement need not be exclusive. The prime contractor may reserve the right to contract with others or do the work itself. Similarly, a subcontractor may seek the seek the right to team with others.

In order to permit the exchange of information between parties to determine whether a teaming agreement is in their best interests, the parties may enter into a technology exchange agreement designed to protect exchanged proprietary information. The teaming agreement itself should contain a confidentiality agreement that expresses the parties' agreement to provide each other with necessary data. The teaming agreement may also contain a licensing agreement that places restrictions on the use of data by the receiving party. A teaming agreement will usually be of definite duration, usually until the project is awarded. At that juncture, the parties usually will enter into a subcontract. The teaming agreement should specify when and under what circumstances it may be discontinued.

2. *Joint Ventures.* A joint venture is a business entity formed to undertake one project, i.e., it exists for a limited duration. Its hallmark is

shared responsibility among the joint venture partners. Joint ventures may provide a necessary combination of financing (equity or otherwise), expertise, and sponsor diversification in international projects. Usually the entity formed is a partnership, although it may be a corporation. If the joint venture is seen as existing for more than a single purpose, it may be seen as a general partnership with the members exposed to unlimited liability. Antitrust or other laws governing business associations may apply to joint ventures.

All actions are taken in the joint venture's name. The parties to a joint venture have mutual control, although that control need not be equal. The joint venture agreement should identify the rights and obligations of the partners and provide for the administration, termination, and dissolution of the joint venture. The joint venture agreement may identify a managing partner who will be responsible for the day to day operations of the joint venture. The joint venture agreement should identify the contributions expected of each partner, including allocations of work responsibility. There is a sharing of profits and losses as stated in the joint venture agreement. Anticipated profits usually are divided up among the stages of the work, and then further subdivided within each stage. Each venture is liable individually for the venture's debts.

3. *Consortiums.* Consortiums are frequently used today in international development projects. The typical group would include one or more developers, engineer-constructors, manufacturers and financing organizations. The consortium seeks projects and shares the costs of development through in kind services or direct funding. Risk is shared by percentages called out in the agreement. Upon financial closing, the consortium would be replaced by a more formal special purpose entity for that project. A consortium agreement is used in international contracting where equipment installations will form a major part of the project, e.g., generators and turbines. The construction contractor and the major equipment suppliers will coordinate their offers to the owner and agree to joint and several liability. If accepted, the offers will result in a single contract with the owner. Specific risks are assumed by individual members directly through interrelated contract agreements among the members.

4. *Special Purpose Entities.* A special purpose entity ("SPE") is an organization created to limit liability of the participants and to act as the contracting vehicle for a particular project. The SPE is the primary interface with the customer, usually through a long-term service agreement covering design, construction, operation and maintenance. It may be formed by any number of parties, including the construction contractor, designer, operations and maintenance contractor, and possibly third party investors. It may be financed through use of debt and equity. The SPE, in turn, contracts for the design, construction, and operation and maintenance services, most likely to the companies which formed the SPE. SPE's are often used where project financing is employed. In such instances, the SPE will usually be required to enter into financial covenants whereby it may be in default of its financing agreements if it does not maintain certain, debt to equity and coverage (working capital) ratios.
  
5. *EPC Contracts.* A significant decision in risk sharing during construction involves choosing what framework should be used for design and construction agreements. Two of the main choices involve either a construction management, multiple prime approach ("CM") or a design-build, Engineer, Procure, Construct ("EPIC") approach. Both can provide fast track delivery and guaranteed maximum pricing which are desirable for innovative financing opportunities. Variations in the importance of the risk factors of time, cost, and control over quality affect the initial contracting choice.

Careful contract preparation is essential under either approach. Design-build or EPC contracting is a project delivery process in which all of the design and construction responsibilities are placed in a single entity. The engineer and the builder typically enter into a joint venture or subcontract arrangement, and the resulting single entity contracts directly with the owner. The primary advantage of EPC contracting is the single point of responsibility for all aspects of design, procurement and construction on a project. The designer-builder takes responsibility for completing the project in accordance with the owner's time and budget requirements. It also guarantees that the project will perform as designed. When problems arise on a design-build project, the owner is not faced with the prospect of sorting out who is at fault the engineer, the construction

manager or one of numerous prime contractors.

---

**Part 2** of this report on risk allocation for New Energy/Efficiency Projects will appear in the next issue of *Cogeneration and Competitive Power Journal*. It will focus on two succeeding steps: “**Strategies for Realistic Risk Allocation**,” covering Design and Construction Contracts, Governmental Risk Management, How to Draft Schedule Provisions, Allocating Delay Risks, How to Account for Environmental Hazards, Addressing *Force Majeure*, and Power Purchase Agreements.

The next section in Part Two, “**Mitigating Risk Through Effective Dispute Resolution**,” will discuss Partnering, Multi-Step Dispute Resolution Systems, The Disputes Review Board, and Mediation.

---

#### ABOUT THE AUTHOR

**Christopher Kane, P.E., Esq.**, was a principal in the law firm of Bastianelli, Brown and Kelley specializing in contract preparation, risk management, innovative finance and dispute resolution on complex energy and environmental projects. He recently became associate general counsel of Raytheon Engineers and Constructors, Inc., responsible for the Infrastructure Group.

Mr. Kane has represented investor-owned utilities, municipal utilities, independent power producers, gas pipeline companies, remediation contractors, institutions, electrical contractors and hospitals. Services to these clients include preparation and negotiation of agreements for engineering, construction management, design-build, procurement, operating and maintenance as well as the design and implementation of dispute resolution systems during project delivery. He also performs work as a neutral in evaluation of contract disputes and in arbitration and mediation of disputes. His recent project involvement includes resolution of complicated contract issues on Coal Gasification-Combined Cycle Projects and a 345 kV Transmission Project; contract preparation for a Reverse Osmosis Waste Water Treatment Project and a Cogeneration Ice Making Facility; consultation with DOE laboratories on alternative dispute resolution for energy savings performance contracting; and consultation to state agencies on innovative financing for infrastructure projects.

He has spoken and presented papers at many national conferences

and for local business organizations on improved construction contracting methods, environmental regulatory issues and innovative methods for resolving disputes, Mr. Kane's writings have been published in *Power Engineering*, *Strategic Planning for Energy and the Environment*, *Public Utilities Fortnightly*, *Independent Energy*, *Electrical World* and *Energy Engineering Journal*. He has also participated on the Engineers Joint Contract Documents Committee which develops and updates standard forms of agreements for use on engineered projects. Mr. Kane is a member of the National Society of Professional Engineers; Assoc. of Energy Engineers; The Section on Energy, Environment and Natural Resources of the American Bar Assoc.; The Florida Business Roundtable; and The American Arbitration Assoc. Panel of Mediators and Arbitrators.

Mr. Kane is a licensed professional engineer and attorney and is qualified as a dispute resolution neutral. Prior to receiving his law degree, Mr. Kane was a captain in the US Army Corps of Engineers involved with projects in the Pacific Northwest on waterways and public lands. Later he worked as a professional engineer for George Washington University, Physical Plant Department. As a lawyer, Mr. Kane spent several years as corporate legal counsel and manager of contracts for the power division of a construction company and has been in private practice since 1987.

*Christopher Kane, P.E., Esq., Raytheon Engineers & Constructors, Inc., 510 Carnegie Center, Princeton, NJ 08543; Phone 609-720-3047; fax 3571; Christopher.kane@ccgate.ueci.com*

**George W. Stiffler** is a member of the Washington, DC, law firm of Bastianelli, Brown & Kelley, Chartered, where he concentrates his practice in government contract litigation, information technology, and counseling. His experience includes claims, bid protests, defective pricing, and procurement fraud.

Mr. Stiffler has represented clients in a number of large federal and state contract claims, including cases involving defense information systems, secure communication systems, aircraft design, construction, and ship repair. He has practiced before the various federal boards of contract appeals, the United States district courts, and state administrative boards. In addition, he has litigated bid protests before the General Accounting Office and General Services Administration Board of Contract Appeals concerning a variety of procurements, including information technology and communication contracts. Mr. Stiffler has also been in-

volved in issues concerning federal supply schedule contracts, false claims liability, and defective pricing.

Following graduation from the College of William and Mary (B.A. 1978) and the George Washington University National Law Center (J.D. 1981), Mr. Stiffler served as a staff attorney at the United States Claims Court and then as a law clerk to the chief judge of that court.

Mr. Stiffler is a member of the District of Columbia Bar. He is also a member of the American Bar Association Litigation and Public Contract Sections and the Federal Bar Association. Mr. Stiffler has authored articles addressing the recovery of attorney fees under the Equal Access to Justice Act and contract terminations.

*George W. Stiffler, Esq., Bastianelli, Brown, Touhey and Kelley, Two Lafayette Center, 1133 21<sup>st</sup> Street, NW, Suite 500, Washington, DC, 20039; 202-293-8815*

## References

1. Keating and Young, Privatization of Public Infrastructure Projects, Construction Briefings No. 93-8, July 1993.
2. Asia Law & Practice Publishing Ltd., *Project & Infrastructure Finance Handbook*, Asia 1997, Pub. No. ISBN 962-7708-98-04
3. International Finance Corporation, *Financing Private Infrastructure*, World Bank and International Finance Corp. 1996.
4. *Nevitt and Fabozzi, Project Financing*, 6th Ed., Euromoney Publications 1995.
5. "Avoiding And Resolving Disputes During Construction," The American Society of Civil Engineers, 1991.
6. "Preventing And Resolving Construction Disputes," Center For Public Resources, Inc., CPR Legal Program, 1991.
7. "Mitigating Construction Contract Disputes," *Public Utilities Fortnightly*, by Christopher Kane, July, 1992.
8. "Team Building," *Independent Energy*, by Christopher Kane, April, 1993.
- 9 Section 4: Chapter 23, *Managing Project Risks Through A Team Building Approach*, appearing in the book *Utility and Independent Power: Concept for A New Millennium*, The Fairmont Press 1997.
10. "Developing and Financing Merchant Power Plants in the United States," Matthew J. Ryan, Manager—Project Finance, Black & Veatch, presented at Power Gen. 97 conference, Dallas, Texas.
11. Project Finance, "Adapting to the New Environment," *Electrical World*, January 1998.