Investment-grade Audits... Fact, or Fiction

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ABSTRACT

Performance contracting is all the rage for facility managers in the late 1990s and early 2000s. Everybody talks about "energy audits" and "investment-grade audits," but what's the difference, and what is an audit, really? This article provides a down-to-earth discussion of the need for and benefits to be derived from doing investment-grade audits. It also provides a detailed description of what an investment-grade audit should be—as based on the author's more than two decades of experience in the performance contracting field, his nationwide seminar on performance contracting, and his forthcoming book by The Fairmont Press.

INTRODUCTION

Depending upon who you talk to in the performance contracting industry, the concept of the "investment-grade audit" is either waved aside as a foolishly expensive techno-babble academic exercise, or a critical element in developing a successful project. While it can in fact be either one (mostly depending upon who's doing the audit), what you will read in the following is a rather strong statement of the case in favor of the investment-grade audit, in one "flavor" or another. In fact, it is not just a statement in favor of investment-grade audits, but a statement in favor of doing performance contracting in such a way that the door is opened to investment-grade audits and makes them an integral part of the process, rather than an almost "accidental" part of the process.

A PROBLEM EXISTS

One of the problems with the performance contracting industry (or "energy services" as it was known in the early 1980s when we helped to formulate the industry), is that it has always been sort of a "rogue" business—not falling into any existing category of business, sort of hard to understand, and therefore inclined towards freelancing and not following any particular standards, nor really even having its own "standard of care" as such things are referred to in legal circles. Some have claimed that as the industry has matured, the "hit and run" ESCos are no longer with us. Unfortunately, nothing could be farther from the truth.

The dichotomy that exists in this industry is that on one hand, the business proposition is compellingly simple, but on the other hand, the actual implementation is devilishly tricky.

First of all, we have to deal with the technical and organizational problems associated with determining actual existing field conditions. Then we have to conceive, design, and build a complex retrofit project (like doing a heart transplant on a marathon runner… during a marathon). Finally, we have to keep it working when the end users may actually be in resistance (to lighting controls, building automation, etc.). After scaling these hurdles, we then have to deal with the fact (as mentioned in the Spring 1998 *Energy & Environmental Management* article "Measurement & Verification Options") that **savings cannot actually be measured**. That is to say, cost avoidance can be accounted for, but the actual stream of savings is a use of energy that *no longer exists,* and it is therefore physically impossible to slap a clamp-on ammeter around it to measure it. Combine this with the owner's greed occasionally getting in the way (ala *Alameda County v. Western Energy Management, et al*) and the owner actually encouraging unethical energy service company (ESCo) behavior, and you have significant potential for calamity—especially when the unwary owner and the unscrupulous ESCo collide, but also when other well-intended parties (on both sides) pursue performance contracting in relative ignorance. Given the rush of energy service providers (ESPs (as opposed to ESCos) to add energy service offerings to their commodity portfolio, calamities are inevitable (and already occurring).

THE "SALESMAN'S" POINT OF VIEW

I do not present this point of view spuriously. It is real, in many

cases fairly held, and it continues to recur as turnover in sales staff takes place every few years. It is, however, largely wrong.

This point of view (perhaps unfairly named) holds that the whole business of performance contracting is simply one of marketing—specifically product packaging and sales. The salesman's point of view is that there is a need in the marketplace and that the smart company (and salesman) simply provides what it is that the customer thinks they need. Within this mindset:

- The project is just a somewhat unique assembly of widgets (lighting, digital controls, some chillers, perhaps a few rooftop units, etc.).

- Engineering is a commodity at best (in fact it really is only needed to identify the parts needed, not to really do any analysis or design).

- Energy audits and studies use things like impossible-to-understand-or-prove computer simulations.

- It is really the owner's ultimate responsibility to make everything work.

- The guarantee is only there because the competition offers it as well.

Combine this with levels of sales performance bonuses that are generally unequaled elsewhere in the HVAC industry, and you have very little motivation for taking the performance contracting process seriously.

The truth is, given buildings of low complexity, a large inventory of facilities over which to spread risk, a little bias on the salesman's part towards ethical behavior, a company possessing some actual, practical energy retrofit acumen, and you can actually produce workable projects.

But accidents don't equal good policy and good procedure—as, for example, a few ESCos learned in the recent past.

The first of these was competing for the large project described in the Summer 1998 *Energy & Environmental Management* article "What Do Customers Want Besides Lower Energy Costs?" During the interviews at

the ESCo's office, this one ESCo responded to an inquiry regarding their engineering resources by rattling off five consulting firms' names in a single breath. What this told us (and the owner) was that this ESCo viewed engineering as a commodity (the firms they named ranged in capability from not-good-enough-to-build-a-dog-house to the best in the business—frightening indeed!), and that they had so many names meant that they did not have a solid working relationship with any of these firms. This, among other reasons, got them "cut from the squad." Curiously, we later learned that the performance contracting manager (and interview leader) for this ESCo had "learned" the business working for a competitor best known for their marketing skills rather than their execution skills.

The second of these was another Fortune 500 company that had signed an audit agreement with a medium-sized school district (21 sites, 900,000+ square feet). This one-page agreement provided for the ESCo to prepare a "detailed energy audit" (yes, those *three* words were the entire specification for the audit) for a fee of $75,000. Upon completion of their work, they presented the owner with a 36-page audit report. This was very disconcerting to the owner, who requested that more detailed information be provided. After a few more submissions by the ESCo (a total of four, one original and three supplements), we were finally brought in to assist the owner. Amazingly, after four submissions, there was still *not a single energy savings calculation* in the audit report(s)! When privately questioned on this later, the ESCo replied, "Well, we don't give our customers detailed information, because they trust us." Based upon our recommendations, the owner insisted that the ESCo fill in the details (in spite of the fact that they trusted their ESCo) and eventually closed the deal with this Fortune 500 company on a $3,000,000 performance contract. The ESCo in this case has still not figured out the folly of their strategy, or that it cost them almost a year's delay in the project (this lack of corporate memory is one of the bad side effects of rapid turnover in this relatively volatile industry). Curiously, the sales manager for this Fortune 500 company later joined Enron as a performance contracting manager!

The third of these was a Fortune 500 company that was completing the first of (they hoped) a series of performance contracts for a large school district in the southwest. As the first-phase project was completing, the owner's project manager got nervous and called in a consultant to audit the project. What the consultant discovered was that the work promised by the performance contractor was, to a large extent, incom-

plete. The ESCo had promised in writing to restore existing HVAC equipment to like-new condition, but actually never really intended to do this—a bit of sales chicanery, if you would—claiming instead that only work needed to produce the guaranteed energy savings was ever intended. The consultant interpreted the contract language literally and reported his findings accordingly. The ensuing dispute resulted in future large projects being canceled and the Fortune 500 company incurring large legal fees attempting to restore their integrity in the eyes of the bystanders.

A BETTER POINT OF VIEW

A truly better point of view is one which serves the (long-term) best interests of *all* the parties involved. As developed over nearly two decades of experience in the field, presented in our nationwide seminar on performance contracting and as embodied in the performance contracting program we developed for the State of California (and for our clients like the San Francisco Unified School District) is an open-book, process-oriented, qualification-based, pay-as-you-go approach to performance contracting. This approach is as follows, and due to its very nature opens the door for the use of investment grade audits:

- The owner prepares a preliminary assessment of conservation potential to gauge the opportunity and likelihood of success of a performance contract.
- ESCos are considered and selected on the *basis of their qualifications*—in return for which they agree to an open-book process and pre-agreed margins and definitions of project costs.
- The ESCo is *paid* for doing the investment-grade audit and must meet a fairly stringent criteria for the audit, including full disclosure of all the audit information, including cost estimates and sub/vendor quotes (and making a commitment to a (reasonable) minimum level of savings, else they do not get paid (see further comment on this below).
- The owner participates in developing the audit and selecting the final package of retrofit measures to be implemented under the program.

- The parties enter into an energy services agreement (ESA), which is a third-party document that both parties examine at the very beginning of the process, and is finalized following completion of the audit.

- The project is designed, documented, installed, and commissioned according to fairly stringent criteria in the ESA.

- Ongoing measurement and verification is conducted for only a fairly short "guarantee demonstration period" (nominally 14 months) following completion of the installation so as to *keep M&V costs to a minimum* and to *focus the concentration of both parties on making sure everything works*—rather than waiting for a year or more to even check the results (which is *very* often the case).

This approach solves virtually all the ills we have discovered in the process of creating a performance contracting business unit for a Fortune 500 company and doing lots of expert testimony and remediation work in this field. Moreover, it solves the problem of the investment-grade audit—*that it all too often isn't done*.

WHY INVESTMENT-GRADE AUDITS ARE IMPORTANT

The foundation of every performance contract or energy services project is the technical problems in a facility which cause it to perform poorly and waste energy. It is identifying the problems, or *opportunities*, developing technically and organizationally workable fixes, and putting those fixes in place that makes the whole process work. Treating the audit like a commodity, then, is like getting your quadruple bypass diagnosis from your physician's receptionist. No matter how good he is, the receptionist's opinion is of little value. No indeed, when considering major surgery, nothing short of a Mayo Clinic physical is what most of us would insist upon. Then why do anything less for your building when considering major surgery for it?

Besides laying the foundation for the entire project, the investment-grade audit does some other good things for the project as well. These benefits, by the way, ***benefit the ESCo*** as well as the building owner, and include:

- It dramatically increases the retrofit team's familiarity and knowledge of the facility—which will help the savings analysis, cost estimating, design and installation.

- It increases the documentation shared by the parties, which will help to resolve change orders and other potential disputes later in the process.

- It puts the numbers "on the table" so that the owner sees exactly what the costs are and serves to co-opt the owner into the process—which helps to avoid buyer's remorse down the road (but also prevents the unscrupulous ESCo from employing "value pricing," i.e., exorbitant mark-ups (this is good for all you "straight-up" ESCos!!).

- It provides a set of construction documents that allows the more effective management of subs, commissioning, construction coordination, commissioning, etc.

- It provides a solid base of data for establishing the baseline which will be used during measurement and verification.

In our experience, we have never found a single ethical ESCo who wouldn't "kill" for the chance to open his books in return for being part of a qualifications-based selection and negotiated contract process. Only those who have admitted to us that their policy is "rape, pillage and burn" have found this approach unworkable. But, hey, too bad for them.

THE INVESTMENT-GRADE AUDIT DEFINED

So what is this thing we're referring to as an investment-grade audit? Well, it's a lot of things, but mostly it is a process of investigation and creation and documentation. Our criteria runs quite a few pages in the contract documents we prepare for our clients, but basically it includes the following:

- **Energy Accounting**. Before anyone even steps into the buildings, the very first step should be the gathering of all the energy data for

the facilities and analyzing it to develop energy use and cost indices. These data can be used to triage multiple facilities (such as school districts) into three groups of facilities (big/bad energy "hogs," big-and-moderately-bad/small-but-seriously-bad, and the "don't waste your time") so that effort on the audit and on the retrofit program can be directed accordingly. We saw one Fortune 500 company some years ago spend as much money retrofitting 40,000 Btu/sf/yr elementary schools as they did on 100,000 Btu/sf/yr schools for lack of understanding this step (the whole project team was later given the opportunity to find new jobs, by the way).

- **Field surveys**. We identify two basic types. The first of these is the observation survey, during which the auditors look at what is going on in the building—and why. This survey is intended to identify problems (but not yet quantify them). The second type is the data-gathering survey, in which name plate data, instantaneous measurement, or time-series data are gathered for quantification of the energy used and the potential for savings. Following the field survey, the ESCo is required to issue a preliminary report and make a go/no-go recommendation. If the ESCo's commitment to a minimum level of savings that can be financed in a self-funded project cannot be met, this is the time for them to pull out and cut their losses (far superior to having a bunch of ESCos doing "B.S." audits on speculation and "ginning up" savings figures out of the "ether" during a request-for-proposal process).

- **Energy balance/computer modeling**. As we have explored in numerous papers (and in our Fairmont Press book published in 2000), computerized simulation does not have to be costly, especially if modest approaches (such as spreadsheet models) are used. Some avoid building simulation due to their perception of its high cost. However, whether it is used or not, at some point an accounting of all the sources and use of energy (sound familiar to you MBAs out there?) must be done. The purpose of the energy balance is to prevent double counting of savings and to keep all the estimates of savings bounded by the energy attributed to the end-use processes being retrofitted. Don't laugh. One Fortune 500 company we know of guaranteed $150,000 per year in gas savings on a building that only used $50,000 worth of gas to begin with!

- **Energy Conservation Measure (ECM) development**. Each ECM under consideration should have developed for it an outline scope of work, preliminary sizing calculations, preliminary equipment selection, sketches (for complicated ECMs), detailed cost estimates, and both a statement of the principles of how the ECM will save energy and how that energy savings will be estimated (e.g., "air handlers run at night when it is cool and the space served needs cooling—we will add outside air economizers for "free" cooling and simulate on DOE-2 by adding economizers to the retrofitted air handling systems").

- **Detailed savings calculations**. Someone at some point has to sit down and say what they think the savings from a given retrofit are going to be. This needs to be documented, by type of energy saved, by piece of equipment being modified, as a percent of the equipment/end use being modified (numbers greater than 100 not allowed!) and the M&V approach planned for the retrofit (yes, M&V starts at the beginning, not the end of the project).

- **Audit report**. All the data gathered above and all of the analysis needs to be bundled up in the final report. This report should be presented to the owner in draft form, the ECM "package" discussed and negotiated, and the report then finalized.

Our standards for doing this work also include criteria for the engineer performing the audit as well. Generally, we are primarily looking for engineers *other than* traditional consultants who do new construction, as it is rare that new-construction consultants have practical retrofit expertise. Similarly, we avoid what we call the "study kings," i.e., those firms that have traditionally specialized in audit work for "low buck" government agencies and have little expertise in designing and commissioning actual projects. We generally look for design-build experience, control system experience, and building simulation experience in selecting consultants for our clients. Building owners are cautioned here as many of the folks out there in the performance contracting business are unable to discriminate between competent energy engineers and the rest—which actually (and unfortunately) reinforces the "salesman's" point of view discussed above when a less-than-competent auditor is employed.

Now, the above describes a pretty rigorous process, and if you're doing a 1,000,000 square foot high rise in the center of town, this is definitely the way to go. However, and as we have previously alluded to, if you're working with an elementary school district, a much "lighter" approach would make sense. We would still call this an investment-grade audit, though the level of site investigation and the rigor of the energy balance/building simulation would be significantly relaxed. The documentation would be commensurately lighter as well, though we would still expect it to be fully comprehensive in nature.

As a rule of thumb, we expect to spend 10 to 30¢ per square foot, or 5 to 10 percent of the annual energy bill in doing investment grade audits. Generally this represents a value in a range of 5 to 10 percent of the overall value of the project. This is another area where intimate involvement between the owner's and the ESCo's organization is important, as the allocation of the engineering resources to the various facilities should really be a collaborative endeavor.

FINAL

To some, this rigorous form of energy audit is new. Well, some energy engineers, your author included, have been doing instrumented surveys and investment-grade audits since the late 1970s. At that time we could not imagine asking our employers to "roll the dice" on anything but a rigorously performed audit. In fact we found it both curious (and frustrating) that only government agencies and other quasi-government institutions felt that "ordinary" audits lacking in rigor were acceptable. We could only conclude that accountability apparently had a lot to do with the judgment of what was acceptable. Perhaps this also explains why the vernacular 20 years ago used by real energy engineers when referring to rigorous audits was "engineering feasibility studies," to avoid the stigma of the term "audit."

To close, we believe that it is important to observe that not a single project that has followed our process has ever come to naught. While some have bemoaned the high cost of investment-grade audits, we can think of no better (or cheaper) insurance for success than doing the homework, and doing it right.

ABOUT THE AUTHOR

James P. Waltz, president of Energy Resource Associates, Inc., has served as energy management program manager for the Air Force Logistics Command and the University of California's Lawrence Livermore National Laboratory. In addition he has worked as an energy management engineer for consulting and contracting firms. In 1981 he founded Energy Resource Associates for the purpose of helping to shape the then-emerging energy services industry—and did so through a multi-year assignment to create a still-successful energy services business unit for a Fortune 500 temperature controls manufacturer.

Specializing in the mechanical, electrical and control systems of existing buildings, Mr. Waltz's firm has accomplished a wide variety of facilities projects, recently including a corporate-wide energy management program review for a major hospital chain, design of a replacement chilled water plant for a northern California hospital, on-site recommissioning of the entire building automation system for another northern California hospital and audit and expert testimony relating to a failed energy services contract for a large southern California hospital.

Mr. Waltz's firm was the State of California's sole performance contracting consultant during their performance contracting program development and provides performance contracting owner's representative services for such clients in 18 western states.

Mr. Waltz's credentials include a Bachelor's degree in mechanical engineering, a Masters degree in business administration, Professional Engineering Registration in three states, charter member of and Certified Energy Manager of the Association of Energy Engineers (AEE), board certified Forensic Engineer, member of the Association of Energy Services Professionals (AESP), Demand Side Management Society (DSMS) and the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE).

Mr. Waltz serves as a member of the DOE's measurement and verification protocol technical committee, responsible for the 1997 International Performance Measurement and Verification Protocol (IPMVP).

Mr. Waltz was named International Energy Engineer of the Year in 1993 by the Association of Energy Engineers(AEE) and taught a nationwide performance contracting seminar through the AEE. He may be reached at www.eraenergy.com.