

Sarbanes-Oxley and Cost Engineering

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ABSTRACT: In the rush to comply with the Sarbanes-Oxley Act of 2002 (SOX), many corporate accounting and compliance organizations have had little time to involve company cost engineers. However, the cost engineer is ultimately responsible for the cost engineering master work process, whether he or she is the director of cost engineering, the manager, or the lone cost engineer (CE), this individual is accountable to corporate management for ensuring the process satisfies all provisions of the act. The purpose of this article is to discuss many of the significant and critical impacts the act has on the world of engineering, architecture, and construction. This article is reprinted from the 2005 AACE International Transactions where it is listed as PM.16. It was presented for publication in the Cost Engineering journal.

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Sarbanes-Oxley was enacted by the US Congress in response to financial reporting scandals at Enron, Tyco, and Worldcom, among others. The act established The Public Company Accounting Oversight Board as a non-profit corporation, consisting of five members, to oversee the audit of public companies that are subject to the securities laws of the US. The Securities and Exchange Commission (SEC) has specific oversight and enforcement authority over the Board.

The act is lengthy and contains many provisions, some of which are mentioned in the following bulleted paragraphs.

- Sec. 301 —requires all regulated companies to have an audit committee as one of the committees of its board of directors and assigns oversight responsibilities for auditing and internal controls directly to this committee.
- Sec. 302 —requires that quarterly, the chief executive officer, and the chief financial officer, or persons with similar responsibilities, must sign-off on the periodic financial statements certifying that the statements fairly reflect the financial condition, and results of operations, for the period presented. Additionally, the signing officers are required to establish and maintain internal controls, assess their effectiveness, and report their conclusions. Any material change in the internal controls structure must be reported.

- Sec. 404 —requires management to document internal controls and evaluate their effectiveness. An assessment of internal controls must be submitted, along with the company's 10-K report, to the SEC at the end of each fiscal year. This is also known as the management discussion and analysis and is frequently abbreviated MD&A. The company's external auditor must attest to the assessment made by management.
- Sec. 406 —requires all corporations to adopt a code of ethics for senior financial officers.
- Sec. 806 —focuses on criminal fraud accountability and provides protection for employees (whistleblowers) who report fraud.
- Sec. 906 —specifies that officers can be criminally prosecuted for corporate non-compliance with the act.

Sections 302 (certification by officers) and 404 (internal controls discussion and attestation) have received the most management attention and significant monies have been expended to ensure compliance with their provisions. Both sections include the requirement that management regularly assesses the effectiveness of internal controls. These two sections are the primary ones impacting cost engineering.

HOW SARBANES-OXLEY AFFECTS COST ENGINEERING

As owners of the financial processes involved with engineering and construction, CEs are responsible for carefully managing and maintaining the integrity of all project capitalizable, and related non-capitalizable, cost data. SOX has elevated the importance of this responsibility.

To fully appreciate the impact of SOX, it is helpful to recognize some of the key functional responsibilities of cost engineering. They include, but are not limited to the following.

- financial stewardship;
- financial reporting;
- internal controls;
- fraud prevention;
- contracts management; and
- audit compliance.

Each of these functional areas involve some of the work processes of cost engineering.

Many cost engineering work processes directly affect corporate financial reports by impacting the following items.

- the value of fixed assets reported on the balance sheet;
- period expenses included on the income statement; and
- cash flows reported on the cash flow statement.

Additionally, many engineering and construction activities involve significant control risks. Management's assessment of the effectiveness of internal controls requires the identification of significant risks and the development of internal controls to manage those risks [2].

Table 1 shows a summary of key cost engineering functional responsibilities and related processes directly linked to Sarbanes-Oxley.

A process is a particular method or system for accomplishing a specific purpose. The processes listed in table 1 are not all inclusive, but provide a likely list for managing the cost engineering effort in any corporation. Identification of such processes is the first step. Once the processes are identified, they can be evaluated as to materiality, complexity, level of risk, etc. Control improvements and repeated evaluations can then be made as needed. Evaluation and continuous

Cost Engineering Functional Responsibility	Key Processes	Sarbanes-Oxley
Financial Stewardship	Estimating Authorizing projects Segregating capital vs. non-capital Administering ethics policies	SOX 302 - Disclosure/ Certification Income Statement Balance Sheet Earnings Taxes
Financial Reporting	Controlling/reporting costs Projecting/managing cash flows Valuing assets Identifying period expenses	SOX 302 - Disclosure/ Certification Balance Sheet Income Statement Earnings Cash Flow Statement
Internal Controls	Establishing the tone at the top Assessing risks Documenting procedures and work processes Managing the Capex program Monitoring	SOX 404 - Management Discussion and Analysis Annual Reporting with 10-K Quarterly reporting
Fraud	Assessing risks Preventing/detecting fraud Safeguarding assets Monitoring	SOX 404 - Management Discussion and Analysis Audit Committee Reports
Contracts Management	Administering contracts Segregating duties Verifying receipt of goods and services	SOX 404 - Management Discussion and Analysis Documentation
Audit Compliance	Proactively monitoring controls Avoiding conflicts of interests Communicating	SOX 404 - Management Discussion and Analysis Reports to Audit Committee

Table 1 — Affect of Sarbanes-Oxley on Cost Engineering Work Processes

improvement are fundamental to the process of assessing effectiveness.

The first processes discussed in this article are closely related to cost engineering's stewardship obligations.

FINANCIAL STEWARDSHIP

Cost engineering's stewardship responsibility begins with estimating the cost of capital projects and ensuring that corporate project authorization procedures are strictly followed. Additionally, the proper segregation of capitalizable expenditures from those that are not capitalizable and administration of the corporate ethics policy, as it pertains to engineering and construction, are two additional processes most directly linked to financial stewardship.

Estimating

One of the core competencies of cost engineering is capital project estimating.

Quality estimates are essential to the effective management of a company's capital budget. Whether the estimate is prepared in-house or by an outside contractor, the cost engineer must ensure the processes used are sound and the product can be used effectively for its intended purposes.

The owner's cost engineer or estimator must validate all contractor-prepared capital project estimates. The authorized estimate is the financial benchmark used to manage the project, forecast capital expenditures, and plan cash flows.

Authorizing Capital Projects

All companies have procedures for authorizing capital expenditures. While financial and accounting organizations typically own this process, cost engineers play a key role in its enforcement and administration. For example, cost engineers must not allow project teams to get a jump on the project by charging

capital expenditures to a non-capital account.

Segregating Capital vs. Non-Capital

Most capital projects have non-capitalizable expenditures in support of the capitalizable work. These are known as abnormal period expenses. Care must be taken to ensure non-capital, period expenses are not billed to capital projects.

The project cost analyst (CA) plays a key role in properly segregating these costs and preventing project teams from playing games with the process. Transfers of monies from non-capital accounts to capital accounts, or vice versa, other than for legitimate purposes, can not be allowed.

Legitimate transfers of large dollar amounts between non-capital and capital accounts must be authorized by a high-level management official (not the project manager), especially at year-end, as year-end transfers tend to attract more audit attention. The cost engineer or cost analyst

must validate the legitimacy of such transfers and ensure they are sufficiently documented to withstand audit.

Administering an Ethics Policy

In order to ensure that all processes maintain strict integrity, a corporate top-down ethics policy is a must in the SOX world. An important responsibility of all employees is that they certify that they know of no improper accounting treatments, or if they do, that they report them to appropriate management. Cost engineers/cost analysts are not accounting experts, but they often are in the best position to detect and protect against inappropriate accounting of project costs. As such, the training and development of cost engineers should include basic accounting controls and requirements for key cost engineering financial processes.

Obviously, financial stewardship of capital expenditures, and their related non-capital costs, is a prerequisite for proper financial reporting.

FINANCIAL REPORTING

SOX requires that revenues, expenses, income and cash flows be reported accurately. Some of the cost engineering work processes that most directly affect this requirement are the following.

- controlling/reporting costs;
- projecting cash flows;
- valuing assets; and
- reporting period expenses.

Controlling/Reporting Costs

Another core competency of cost engineering is capital project cost control which includes activities that are essential to ensuring accurate financial reporting. The cost engineer must ensure that all capitalizable costs are captured and included in the final cost of the project to properly value the assets on the company's property books.

Additionally, the CE must inform the fixed asset accountant promptly when assets are available for use. At the appropriate time, the fixed asset accountant must transfer the correct value of the assets from the construction suspense account (this is the account where construction costs are held/suspended until the work is complete

and the asset is available for use), into the correct fixed asset account(s).

At this point, the asset depreciation process begins. Standard accounting practices and procedures require that transactions be recorded (reported) in a timely manner within the financial accounting period in which they occur.

Projecting Cash Flows

In addition to the income statement and the balance sheet, most corporations issue a cash flow statement to help ensure investors are fully informed.

Capital expenditures may be a significant component of a corporation's cash outflow. The cost engineering director, manager, or engineer, plays a key role in projecting capital expenditures. Collecting project team spend-out forecasts and combining them for a corporate total is not sufficient.

Project teams are notoriously optimistic and, therefore, may tend to overstate expenditures in the short-run. The experienced cost engineer must apply engineering judgment to realistically forecast how much money can actually flow through the system within an accounting cycle.

Where large budgets are involved, millions of dollars can be affected. Accurately projecting capital expenditures is important to ensuring the corporation has enough cash to meet short-term spend-out requirements. Obviously, this is also very important to investors.

Valuing Assets

New assets must be properly valued and reported on the corporation's balance sheet. An asset's value is not just the cost of equipment and labor. Full project level costs must be assigned to each asset. These include the correct prorated value(s) of engineering and design, taxes and insurance and indirect field costs, among others.

Reporting Period Expenses

When earnings are weak, there is a strong temptation to leave non-capital costs in capital and/or the construction suspense account awaiting earnings to pickup. Abandoned engineering and abandoned field costs are examples. These can be substantial.

Once a decision is made to abandon a project (or part thereof), the cost engineer

is responsible for quantifying the effect of that decision and reporting it to accounting for prompt and proper inclusion in the financial data for that accounting period. It is critically important to keep management fully informed. Transfers of abandoned engineering and construction costs to period expenses will have a direct affect on reported earnings for the period.

While the accurate reporting of all financial data is the most important requirement of SOX, establishing and maintaining strong internal controls is clearly SOX's second most important requirement.

INTERNAL CONTROLS

A prerequisite for quality financial reporting is a sound, corporate-wide internal controls process which must start with the chief executive and his or her team of senior managers.

Any independent assessment of a corporation's internal controls will look closely at expectations set by the tone at the top. Key factors that influence that tone and define a control environment will be the corporate code of business conduct, demonstrated integrity and ethical standards of senior staff, delegation of authority and responsibility, and managerial enforcement of procedures and processes. The cost engineering process leader must set a tone consistent with that set by corporate management.

Once the corporate internal controls expectations are established and communicated to the organization, the CE begins the process of identifying and assessing engineering and construction risks. Risk areas identified by risk analyses must be addressed and managed to avoid and control risks in line with the corporation's level of risk tolerance. The capital asset procurement and construction contract management processes are undoubtedly risk areas requiring strong internal controls.

The corporate cost engineering process leader is responsible for both the assessment of process risks and the sub-processes that best manage those risks. To comply effectively with SOX, all of the processes (and others as may be needed) listed in table 1, must be well documented and designed to adequately control the identified risks. A separate policy statement and procedure are not required

Item	Types	Key Attributes
Project Delivery Method	Design-Bid-Build	Scope is fully defined, contract type is typically Lump-Sum/Unit-Price, total cost is known up-front.
	Design-Build	Incomplete scope, contract type is typically cost reimbursable, time is of the essence, total cost is not known until later in the life of the project.
	Indefinite Quantity	Repetitive type work, task order or job order contracting, strategy may vary (Lump-Sum/Unit Price or Cost Reimbursable).
Types of Contracts	Fixed-Price/Lump-Sum/Unit-Price	Firm scope of work, commitment to minimum scope changes, adequate time for quality bidding process, competitive marketplace. Higher risk for contractor.
	Cost Reimbursable	Contractor is paid for actual cost to perform the work, cost plus fixed fee or time and material. Higher risk to owner.
Key Clauses	Managing Change	Very important to allow owner to make changes to the scope, sets provisions for additional compensation to contractor, should address owner's right to audit change orders not competitively bid.
	Right to Audit	Usually included in cost reimbursable type contracts, should specify scope of audit, set time when audit must be completed.
	Terms of Payment	Sets forth how often contractor will be paid, conditions that must be met (per cent work completed), invoicing/authorization requirements.
	Dispute Resolution	May specify owner/contractor management team, mediation, or arbitration.

Table 2 — Project Delivery Methods, Types of Contracts, and Some Important Contract Clauses

for each of the processes listed, but all the processes should be covered in those procedures that are documented.

A well defined capital expenditures policy, and its related procedures, should cover the following.

- clearly establishes approval and authorization requirements;
- prescribes sound procedures for the procurement of architectural /engineering services;
- sets forth detail construction contract administration procedures;
- requires effective verification of receipt of goods and services, and
- provides for the prompt and proper payment of related invoices is a must.

However, well-documented processes and procedures are not the products SOX is expecting. Compliance is! Corporations are required to have in place an effective monitoring process that identifies process /procedure violations or weaknesses, affects corrective actions, and reports any significant changes.

A major objective of internal controls is the prevention of fraud.

FRAUD

Construction fraud has many forms and faces. These include the following.

- deliberate over-billings by contractors;
- illegal kick-backs;
- thefts of physical assets;
- embezzlement;
- unauthorized substitutions;
- deliberately shorting code and/or specification requirements;
- corruption in the trades;
- phantom employees;
- bribery;
- extortion;
- bid rigging or job sharing; and
- others.

SOX requires all corporations to have a vigorous antifraud program. As part of the annual assessment of internal controls, special attention should be given to corporate-wide fraud prevention, detection and reporting. The owner's cost engineer plays a key role (may even own the process) in engineering and construction antifraud programs. Because prevention of fraud is the primary objective, companies cannot rely only on internal auditing to detect fraud and initiate recoveries. The cost engineer must be proactively involved in

fraud prevention and detection throughout the year.

As part of its emphasis on fraud, SOX considers the following several actions/inactions as significant deficiencies:

- failure to identify risks associated with contractor billings;
- misappropriation of assets;
- acceptance of gifts/favors/kickbacks;
- embezzlement by project managers or contract administrators; and
- conflicts of interests.

One area of risk for fraud may be with senior staff members in a position to authorize/award contracts. Some studies report as much as 90 percent of all fraud is perpetrated by members of senior staff [3].

Recommendations

- Refer any concerns with senior management to internal auditing for follow-up as appropriate.
- Train owner construction project managers and/or contract administrators (PMs/CAs) to be alert for, and protect against, fraudulent activities by contractors.
- Require PMs/CAs to undergo fraud prevention training when first assigned

to the position and periodically thereafter.

- Require annually that all PMs/CAs review and sign a code of business conduct that includes risk areas unique to engineering and construction.

Monitoring of the antifraud program should be on-going and evidenced by the reporting of fraudulent activities, internal audits, and training. This practice will serve to support a management assessment that internal controls are in place and effective at protecting the corporation against significant risks.

An aid to preventing fraud in engineering and construction is a strong contracts management process.

CONTRACTS MANAGEMENT

Contracting is the primary method of performing capital project work. Owner project managers, by necessity, must be good contract administrators. They must be knowledgeable of the key steps in effective contracting, which includes pre-qualifying bidders, administering bids, negotiating the contract with the successful bidder, executing the contract, and finally, administering the contract.

In some environments, owners enter into contracts with architects or third-party construction managers, whereby the architect or construction manager agrees to administer the contract. While management can assign contract administration duties to a third party, that does not relieve management of its responsibility to ensure proper controls are established and enforced. Care must be taken to guard against conflicts of interests.

Additionally, management must monitor the effectiveness of all project controls (see table 2). There are some administration responsibilities that must remain with the owner. Selecting the correct contracting strategy and monitoring the performance of the architect or construction manager can not be subcontracted.

Some keys to successful contracting include the following [4].

- Prepare a high quality scope of work that defines in adequate detail the work that is to be done by each party, when and to what degree of quality.

- Select a project delivery method that is compatible with the project schedule.
- Select the type of contract that best aligns with the quality, and degree of completeness, of the scope of work and the schedule. Understand market conditions.
- Include key contract clauses that facilitate contract administration and minimize the risks of disputes.

An important best practice must be in place that segregates duties within the owner organization. Verification of receipt of goods and services must be segregated from authorization to pay the invoice. This is a basic control that deters/prevents fraud.

AUDIT COMPLIANCE

Despite the need for cost engineers to be closely involved in areas affected by SOX, it is not their role to be internal auditors. Internal auditors traditionally respond to currently identified non-compliance problems, perform post-activity audits, and evaluate the effectiveness of internal controls. The cost engineer is proactively involved and is expected to prevent audit exceptions from occurring.

The director or manager of cost engineering, the estimator, and the cost analyst (all are cost engineers) are expected to perform their responsibilities in a manner that assures compliance with all corporate procedures.

Additionally, as owners of the financial processes associated with engineering and construction activities, they must ensure that all activities, including project management/contract administration, comply with all corporate and legally mandated requirements. This is a part of ongoing monitoring required by SOX.

The architecture/engineering and construction organizations are responsible for activities that involve significant risks. As owners of the financial processes for these organizations, cost engineers are responsible for the following.

- identifying processes;
- assessing process risks;
- ensuring processes are sound and well documented;

- enforcing corporate and legally mandated requirements;
- continuously monitoring and assessing processes; and
- upgrading processes as needed.

Sarbanes-Oxley is not just applicable to senior management and accounting. It reaches into all corporate departments /organizations, including cost engineering. ♦

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