Sarbanes-Oxley Section 404 Internal Controls and Actuarial Processes

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Abstract

The passage and implementation of the Sarbanes-Oxley Act of 2002 was the most significant landmark legislation in securities regulation and corporate governance in the US since the SEC Act of 1934. In particular, Section 404 of the act requiring management assessment and assertion on the effectiveness of internal controls along with the requirement that the auditor attest to the assertion, has greatly impacted actuarial work processes for many actuaries. This paper discusses the implications of the Act for actuaries based on analysis of actuarial functions within insurance companies. Also discussed are the observed impacts within the industry to date. Based on these observations and experiences, an overview of a typical internal control framework is introduced. Impacts on Actuaries working in financial reporting are far reaching, as well are the risks created by the Act. On the other hand well designed and operated controls may serve to reinforce the professionalism of the Actuarial work product, reducing certain risks for Actuaries. In addition, there is an unrealized potential for the increased focus on controls and documentation to strengthen the integrity of results reported by insurers, leading to increased stability in loss reserve estimates.

Keywords

Accounting, Controls, Sarbanes, SOX, Compliance,

1. INTRODUCTION

The year 2002 saw scandals in corporate governance at several large US companies regulated by the US Securities and Exchange Commission, most notably Enron and WorldCom, and the related collapse of one of the "big 5" accounting firms, Arthur Andersen. With the resulting drop in US and world stock prices, there was a high level of political pressure for Congress and the President to act. One result of this was the passage with very little debate in July of 2002 of the Sarbanes Oxley Act. This was the most far reaching piece of securities regulation since the passage of the SEC Act in 1934 which in effect created the securities regulation framework of today. Note that requirements of the Sarbanes Oxley Act fall directly on companies issuing securities on US securities exchanges, known as "issuers", whether domiciled in the US or not. These requirements are not directly applicable to privately held non-issuers, although some have complied with certain provisions voluntarily.

The Sarbanes Oxley Act, also called "SOX" or "SarBOX" had several major provisions. Embedded in the 66 dense pages of legislation were 22 lines on one page called "section 404". Section 404 requires management to maintain an effective system of internal controls over financial reporting. There was nothing new in this requirement; it is also part of

existing regulation and legislation. What was new was the requirement also in section 404 that management assert the effectiveness of those controls, and the auditor then attest on that assertion. Other sections of SOX strengthened and increased civil and criminal penalties for violations of the Act.

Given the extensive scope of the Sarbanes Oxley Act, and the limited debate at passage, it has been argued that the far reaching effects particularly of section 404 were partly unintended, even by the authors of the legislation.

Taken together, these provisions have given rise to some of the most far reaching changes in corporate governance this century and caused the initiation of extensive and expensive projects at almost all companies regulated by the US Securities authorities. It is the implementation, assertion of effectiveness, and audit attestation related to section 404 that is discussed in this paper.

Note that every company is different as far as the types of business written, external environments, markets that are entered, and internal processes and functions. Due to this, appropriate SOX 404 documentation will be different at each company. This paper will give the actuary areas to consider, but cannot be a "one fits all" solution to implementing SOX.

1.1 Other Provisions of SOX

Given the interactions between section 404 and other sections of the Act, a brief discussion of provisions other than section 404 is presented below.

Section 101 of the Act provided for the creation of the "Public Company Accounting Oversight Board", or "PCAOB". It is somewhat amusing to some that the acronym is often pronounced "Peek-a-Boo", named after a game played with children where quick looks from unexpected places are used to create sudden surprised and startled reactions. Prior to 2002, the public accounting industry in the US was self regulated through a quasi-governmental institution know as the "Financial Accounting Oversight Board", or "FASB". FASB remains in existence as the body creating accounting rules governing US Generally Accepted

Accounting Principles ("GAAP"), but powers and responsibility to regulate the accountants now rests with PCAOB.

Section 302 of the Act requires officers of issuers to certify quarterly that to the best of their knowledge, financial statements have been fairly stated. It also requires principal officers to certify that internal controls have been recently evaluated and are designed and operating effectively, or that if not, appropriate reporting has been done. Note section 302 applies to each quarterly or annual reporting, and the assertion regarding internal controls links it to section 404.

Title IX (sections 901-906) establishes severe criminal penalties under certain circumstances for violations of the Act, as well as providing for increased penalties associated with violations of existing securities acts. Penalties are increased by orders of magnitude, often factors of 5, 10, or 20 for fines and jail terms. These provisions have greatly heightened the extent of documentation and formality regarding section 404, as all involved want to ensure there is no misunderstanding regarding the operation of controls, and the precise boundaries of the scope of various sign-offs.

Note that the comprehensive summary of provisions of the SarBOX Act is not intended within the scope of this paper. Many other provisions regarding the regulation of accounting firms, broker dealers, permitted audit services and fraud and penalties for fraud are addressed by the Act. This paper is also not intended to provide legal advice or counsel. If such counsel is needed, readers should consult their legal or professional advisors. The survey above is merely intended to give the reader a view into the environment created by SOX for those involved in creating, documenting, implementing, and operating internal controls over financial reporting.

1.2 Research Context

The CAS maintains a "research taxonomy" of topics to which papers can be categorized. This paper is best classified under the topic II-Actuarial Applications and Methodologies,

and subtopic A-Accounting and Reporting. The CAS has created more detailed subtopics, but given the recent nature of the requirements of Sarbanes Oxley, and the breadth of the requirements, more detailed classification is not possible. Also as the requirements of SOX are new, there are no relevant articles known to the authors at address this topic in CAS literature or as SOX section 404 relates to actuarial processes anywhere. Survey type of information is available from various professional firms if needed by the reader, often on their websites, and these can give more specific information.

1.3 Objective

It is the objective of this paper to give readers a basic understanding of what is involved in section 404 implementation, and provide a framework against which to evaluate their own internal controls over financial reporting for property/casualty Actuarial processes. In addition, an overview of activity to date in the industry is provided.

1.4 Outline

The remainder of the paper proceeds as follows. Section 2 will give the reader a working overview of the provisions of the Act, especially as regards section 404, the internal control requirement. Section 3 will give the reader a framework of controls around actuarial reserving processes. While every company will need to tailor controls around the unique circumstances of that company, the framework is designed to help give clarity and completeness to those considerations. Section 4 will build on the framework by giving a discussion of particular issues that have come to the fore in implementations of SOX 404 so far. Section 5 closes the discussion with some final remarks.

2. SUMMARY OF SECTION 404 PROVISIONS

Section 404 of the SOX Act contains relatively little information about what is actually required. However, luckily for those implementing the Act, the PCAOB has provided extensive guidance regarding the audit in the March 9, 2004 "PCAOB Auditing Standard

No. 2" often referred to with the rhyme "Peek-a-Boo, Number Two". This guidance is mainly aimed at auditors, but since the audit consists of an all encompassing review of management's documentation and assertion, it is equally interesting to company management implementing the provisions of the Act.

2.1 Entity Objectives vs. Financial Reporting

An important consideration to keep in mind in evaluating internal controls for purposes of SOX is that SOX applies only to internal controls over financial reporting. It does not otherwise require controls over operational aspects of the business designed to achieve the entities' objectives. A way to think about this is to think of pricing and underwriting business. SOX does not require management to assert to effective controls around the profitable underwriting of business to meet ROE targets, although one would expect the board of directors would require this. However, SOX does require effective controls enabling management to properly ascertain the profitability of the business being underwritten, and to properly report the financial results in financial reports to the public. Note that there would also be the consideration as to whether disclosures over management's strategy would be required if unprofitable business was being written. This might be subject to SOX controls and is a matter of judgment.

Note that restricting the requirement to only financial reporting doesn't relieve the SOX evaluator from considering relevant non-financial controls. For example, controls pertaining to non-financial data that is used in analytical procedures that have a direct and material effect on the financial statements would be in scope[1] Using our example above, if underwriting controls were relaxed enough that an evaluator could not be reasonably assured that risks were being properly classified under the class plan, then risks could be mis-priced in such a way that the reserving actuary could not reliably calculate a loss reserve. This type

[1] See the American Institute of Certified Public Accountants ("AICPA") section 319 for additional discussion of this.

of analysis would seem to scope in certain controls that one might otherwise not consider subject to the Act.

2.2 Classification of Deficiencies

In certain cases, a situation may be identified whereas internal controls are not effective regarding some aspect of the business. This issue is termed a ***deficiency*** in the internal controls. In this case two actions should occur; remediation should be identified and implemented. Then an evaluation of the seriousness of the deficiency should occur.

Deficiencies can be classified into three categories. PCAOB No. 2 defines these categories, but in a way such that the implementer needs to exercise judgment. These deficiencies are as follows:

Type of Deficiency	Criteria	Reporting Requirement
Deficiency	Doesn't rise to either of the more severe levels	Auditor to management
Significant Deficiency	Results in a more than remote likelihood of a misstatement that is more than inconsequential	Auditor to Audit Committee
Material Weakness	Results in a more than remote likelihood of a material misstatement	Auditor to Audit Committee, and in Audit Opinion (which becomes public)

2.3 The COSO Framework

The "Committee of Sponsoring Organizations", or "COSO", has created a framework for organizations setting up internal controls, and this is known as the COSO framework. The COSO framework covers internal controls over achieving entity objectives, including controls over financial reporting. The aspect of COSO relating to financial reporting is relevant to any implementation of SOX 404. Although COSO is not required to be used by companies implementing section 404, in most cases it is the framework used. The PCAOB guidance is that auditors should expect to see some "COSO like framework."

The COSO framework consists of five basic building blocks. These are:

1 The ***Control Environment***-This is the "tone at the top", does management exhibit solid integrity, ethical values, and competence consistent with strong internal controls;

2 ***Risk Assessment***-Developing an understanding of what could go wrong, so controls can be designed to address risks based on potential severity;

3 ***Control Activities***-These are the control procedures themselves;

4 ***Information and Communication***-Developing enough information so if something does go amiss, management can act to correct it;

5 ***Monitoring***-Active awareness and monitoring to ensure controls are working as intended.

While all five aspects are important, and a control system can fail on any of these points, from a purely practical point of view much of the work involved with compliance centers on documenting the risks and the related controls that address those risks. It is interesting that given the high level of effort in SOX implementation projects on process documentation, flow charts, and the like, that the COSO framework doesn't mention this

as one of the five important areas. Again, from a practical point of view, it is hard to assert controls are effective and efficient without documentation of the process in which the controls take place; otherwise any risk assessment could be problematic. Aside from meeting this hurdle, extensive process documentation doesn't appear to be required under the framework.

3 SCOPE OF ACTUARIAL ISSUES SUBJECT TO THE ACT

Given the application of section 404 to only the internal controls over financial reporting processes, actuarial concerns link directly to such financial statement items as loss and loss adjustment expense ("LAE") reserves on the balance sheet and the related incurred loss and LAE reported on the income statement. In addition, unearned premium reserves may be subject to actuarial analysis, as will loss-sensitive accounting items such as sliding scale commissions, premiums associated with retrospectively rated contracts, or policyholder dividends. Clearly, the actuarial analysis of each of these components is subject to internal control review.

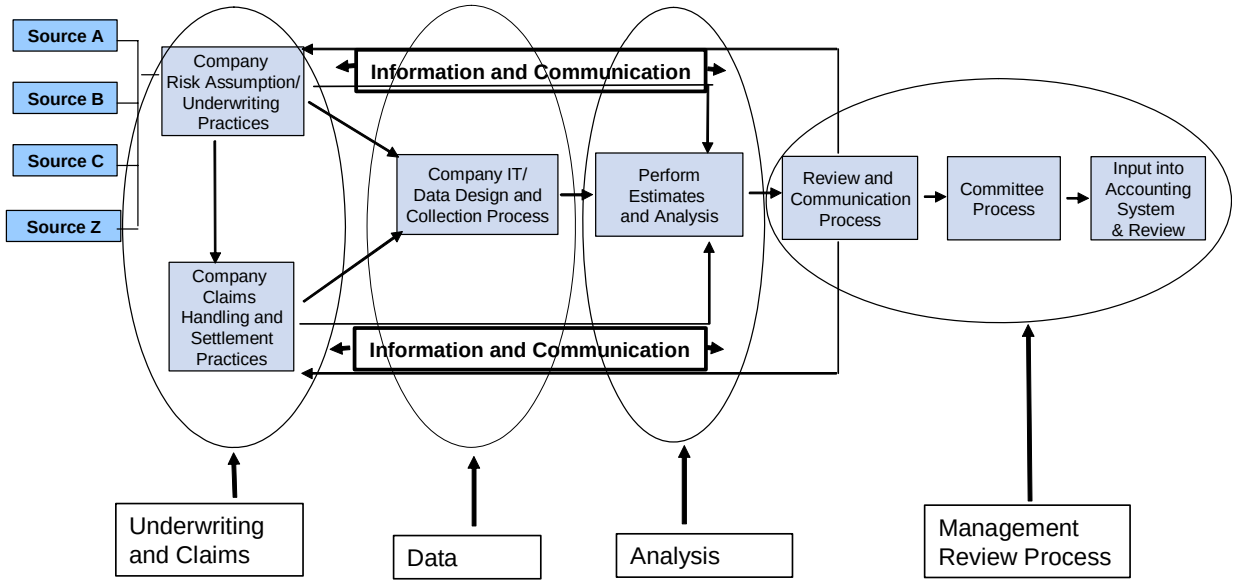
The linkage to pricing is less well defined but is highly relevant. Often, a reserving actuary may utilize the Bornhuetter-Ferguson methodology in estimating loss and LAE reserves, and the a priori loss ratio, often based on historical loss ratio information adjusted for loss trend and pricing changes, is a significant underlying assumption of the method. To the extent that pricing information is extracted, there should be internal controls in place to ensure that accurate information is used.

Further, when booking loss and LAE reserves, many companies rely on the most recent actuarial reserving indications for prior accident years but book the current accident year to a "plan" loss ratio. The current year's plan loss ratio is typically the result of analyses by underwriters, pricing actuaries, and senior management in the previous year, through an examination of historical loss ratio experience and knowledge of pricing changes as well as potential changes in terms and conditions, underwriting guidance and strategic initiatives. Some companies may choose to exclude the underwriting process from section 404 work,

but we consider those components of the process that relate directly to determination of the plan loss ratio and hence to current accident year IBNR to be subject to internal control review. We consider ensuring that managements' basic underwriting controls for the insurance risk being assumed are consistent with that in the planned and recorded loss ratios to be subject to section 404. As an example, if underwriters begin insuring substandard automobile risks using standard rates, underwriting, and pricing plans, while management records loss ratios assuming the same quality of the standard and preferred risks that had historically been written, results may well differ from those expected, and a financial reporting issue will result. In setting the scope of SOX controls, it is important to think through these implications.

The following diagram may be helpful in classifying the risks and controls in an actuarial reserving process:

Actuarial Reserving Process Flow and Key Control Points



This diagram suggests that actuaries should target controls at risk areas (starting from left to right) in obtaining operational input to be sure reserving processes are considering all relevant information. Once data is obtained, there are control steps around reconciling and controlling the data. There should be key controls around analysis, as discussed later in this paper, including peer review, and qualifications of the analysts. Finally, once all of the actuarial analysis process is controlled, control points around the decision process for final reserves should be considered, often including reserve committee, and ensuring those reserves are accurately recorded.

3.1 Quantitative background of insurance company reserves

Property/Casualty reserves are management estimates, and should be viewed in that context. It is a materially different situation if, for example, written premiums are mistabulated resulting in an error, say, of $5 million as compared to reserve development of that same amount. SOX is recent enough that there is no case history surrounding the use of the act by regulators, and how cases will be viewed, evaluated, and even prosecuted. However, actuaries should be aware of the increase in risk associated with provisions of the act, and should prepare documentation appropriate to satisfy any inquiry.

To better frame the risk, consider published calendar results in comparison to accident year results. As the chart below shows, there have been sustained periods where the industry has truly been more profitable than published calendar year results (2001-2004) and sustained periods where the industry has been less profitable than published results (1997-2000).

Industry Experience-Loss and Loss Expense Ratio Comparison of Accident Year to Calendar Year

CY	Earned Premium 000,000's	Accident Year Loss and LAE Ratio	Calendar Year Loss and LAE Ratio	Difference
1995	247,338	76.1%	78.9%	-2.8%
1996	257,558	78.3%	78.4%	-0.1%
1997	265,356	76.0%	72.8%	3.2%
1998	270,253	82.6%	76.5%	6.1%
1999	277,760	84.8%	78.9%	5.9%
2000	291,472	86.7%	81.3%	5.4%
2001	312,286	86.7%	88.4%	-1.7%
2002	351,388	74.0%	81.5%	-7.5%
2003	394,951	68.2%	75.0%	-6.8%
2004	425,230	70.2%	72.8%	-2.7%
Total	3,093,591	77.6%	78.3%	-0.6%

Accident Year Evaluated at 12/31/2004
Negative means the Accident Year Ratio is Less Than the Calendar Year Ratio
Source for Calendar Year: AM BEST Aggregates and Averages, "Cumulative by Line Net Underwriting Experience, Industry".

Source for Accident Year: AM BEST Aggregates and Averages, "Industry Schedule P".

From a balance sheet perspective, there have been periods of sustained reserve inadequacy for the industry, as shown in the following chart:

Industry Experience-Runoff of Held Loss and LAE Reserves
Industry All Lines Experience in millions of US$

Reserve Date	Held Reserves for Loss and LAE	(Equity)/ Deficiency as Recorded 12/31/2004	Ratio (Eq)/Def to Held Reserves
12/31/1995	360,940	(723)	-0.2%
12/31/1996	365,319	189	0.1%
12/31/1997	363,351	6,119	1.7%
12/31/1998	378,278	24,638	6.5%
12/31/1999	375,734	45,101	12.0%
12/31/2000	372,075	64,129	17.2%
12/31/2001	389,764	60,076	15.4%
12/31/2002	414,813	34,650	8.4%
12/31/2003	448,652	9,882	2.2%
12/31/2004	486,438	NA	NA

Accident Year Evaluated at 12/31/2004
Negative means favorable runoff

Source for Accident Year: AM BEST Aggregates and Averages, "Industry Schedule P".

As can be seen, for the industry a bias seems to develop over time, and this bias appears to be coordinated with the market cycle. At times, the bias appears be quite high, such as 1998-2002. Certain lines, such as commercial casualty or reinsurance have exhibited even higher changes in reserve estimates in this period, and the law of large numbers would lead us to believe that individual companies would be more volatile than the industry. One can argue whether management adjustments or the pure actuarial estimate are the main contributors, but in a consolidated reserving process, it is the whole process that must be considered, including both of these sources. For a volatile estimate, such as loss reserves, there is an expectation that changes will occur, and some of those changes will affect past years. However, it is possible that a regulator or auditor will look at situations such as these, and depending on the underlying circumstances, could interpret that an error had occurred rather than simply a change in estimate due to random events. If deemed an error, the change in reserve estimate could be construed as subject to

internal controls covered by SOX. This is an eventuality that should give actuaries reason for caution.

A purely hypothetical example might help to illustrate this. Assume there is a new product or underwriting change that takes place that significantly changes the nature of the book of business. If there is no documentation that the actuary considered this, and significant adverse reserve deviation ensues, there could be an interpretation that such development was not merely random fluctuation. In a more straightforward example, if a management adjustment is recorded and not well documented, if there is subsequent reserve development down the road, this could also be viewed as an outcome that is not the result of random events.

The best practice for the actuary in these situations is documentation. The standard is not that the actuary has perfect foresight in every case. A reasonable standard might be that the risks which may lead to changes affecting reserve estimates have been identified, evaluated, that effective and efficient controls are in place to mitigate those risks, and that the operation of those controls as intended is documented.

3.2 Discussion of surrounding processes

Property/Casualty loss reserving is by its nature a process that needs to take into account broad aspects of insurance company operations such as claims, underwriting, financial, and processing operations which can impact reserve calculations. As part of the documentation of internal controls, the actuary has a stake in the quality of the documentation of other processes; in order to assert effective and efficient controls over reserving, the quality of internal controls over other processes is important. Therefore, the actuary may wish to review other processes before being satisfied that reserving controls are effective. Following is a discussion of items that may be of interest to the reserving actuary in asserting to the controls over reserves.

Underwriting

As discussed above, underwriting controls, and specifically unaccounted changes in underwriting processes, can impact appropriate reserve amounts. The actuary may want to verify that those controls that are typically part of underwriting controls are in place, such as the following:

- Are underwriting guidelines in place regarding the business accepted, and the use of the rating plans and forms;
- Does each underwriter have a written authority which governs the types of risks that can be bound or must be referred;
- Are file audits conducted to verify correct usage of the plans;
- If large risks are underwritten, is there actuarial oversight over the use of large deductibles, excess covers, and other similar tailored plans;
- If Managing General Agents ("MGA's") are given authority, are similar types of controls in place for them.

Consider as well the underwriting related controls that are typically part of actuarial controls, for example:

- Performance of price monitoring function;
- Actuarial analysis documents and takes into account (if appropriate) changes in the underlying book of business, by class, product, or geography, for example;
- Actuarial analysis documents and takes into account (if appropriate) changes in the reinsurance program;
- Expected loss ratios used to set reserves are reconciled to actual results, and take into account the outcome of the price monitoring.

Claims

Similar to underwriting, changes in claims processes can impact reserving calculations. The actuary may want to check to ensure controls that are typically part of the claims process are in place, such as the following examples:

- Is there a written case reserving policy or philosophy that is sufficiently distributed to claims professionals setting reserves;
- Do claims file audits validate that the case reserving philosophy is followed;
- Are controls in place such that claims management would be aware of factors that could impact reserving, such as changes in speed of processing, or changes in statistical reserves;
- If Third Party Administrators ("TPA's") are used, are similar types of controls in place for them.

In addition, the actuary should ensure that they have considered the following areas for controls that may be appropriate in the actuarial internal control framework:

- Analysts obtain, review, and reflect changes in case reserving philosophy, or the processing, system entry, or settlement patterns for claims in the reserve analysis;
- Analysts obtain, review, and reflect claims events that impact projections when performing estimates. Examples are large claims, class action or mass tort claims, or changes in theories of liability.

Financial

Appropriate controls in the financial area that are important to actuaries can include data balancing and edits. In particular, if actuaries balance reserving data to the general ledger, then actuaries may want to enquire to verify that financial controls around the compilation of the general ledger are sufficient. Additional controls are likely part of the

finance process involving the reconciliation of final recorded reserves back to the reserve committee documentation. In addition, financial reports contain extensive disclosures, and actuarial involvement in the process of determining and wording the reserve risk in the disclosures is likely appropriate.

4 ISSUES INVOLVED WITH IMPLEMENTING SOX SECTION 404

4.1 Information Integrity and Availability

Quantitative Data

Companies often have multiple data systems in operation, with the general ledger system being separate from the claims adjusting system as well as those systems providing data to the actuaries for analysis. For internal controls review, there must be an understanding of the data flows from the actuarial database to the reserving actuaries' models. This includes consideration of whether the data received represents the complete universe of information for a particular review segment and whether the data received reconciles to other relevant systems, such as the general ledger.

From a reserving standpoint, reconciliation items should include any data elements that are significant to the actuarial analysis, most commonly paid loss and LAE, case reserves, earned premium, and perhaps claim counts. Often, due to miscoding or manual adjustments after a reporting date has passed, or faulty extraction of data, one will find out-of-balance items between the actuarial database and the general ledger. In such cases, the materiality of the differences may determine how much investigation is done to determine the appropriate data to use. Best practices may include a pre-determined threshold of difference that would spur investigation, and a formal set of steps for conducting such investigation. In practice, judgment often determines whether a difference is worthy of investigation, and the steps taken are common-sense: re-running a data extraction and speaking to IT professionals, accounting or claims professional as necessary to resolve any issues.

The extraction of pricing information, as needed, should also be done within a controlled environment. However, the mechanization of such information varies more widely by company, with some companies maintaining sophisticated price monitoring systems, while others have less thoroughly documented price and rating information. The circumstances surrounding the systems and business processes in place will determine the extent of controls needed for this data.

Qualitative Information

The reserving actuary must process a wide variety of not only quantitative, but also qualitative, information as decisions are made regarding the appropriate methodologies and assumptions to be incorporated within any given analysis. Most commonly, the reserving actuary has significant interaction with the claims department and underwriting department to understand trends in claims handling and exposures, both internally and externally. For example, anecdotal discussion of a speed-up in claims processing and settlement may be verified through examination of quantitative data and adjusted for accordingly within the reserve analysis.

While such discussions are expected and encouraged within most companies, grasping the controls around such discussions are not as straight-forward as a pure data reconciliation. How does one capture the thirty-second conversation with a claims manager by the water cooler? How does one assess whether the actuary properly follows up on the qualitative information given? In the largest organizations, with multiple divisions, is the information interpreted consistently across divisions? Practice again varies widely, but formalized meetings among departments, with formal minutes, provide valid documentation of qualitative data gathering.

Actuarial analysis

The actuarial analysis presents unique challenges in the construction of a controlled environment, due to the highly judgmental nature of an actuary's work. Often, the thought

process behind the assumptions and judgments made within an analysis reside solely within the actuary's head. The need for documentation within a SOX framework, as discussed below, necessitates a major shift of thinking for actuarial departments, a shift that may be met with resistance.

Since, unlike data reconciliation or other audit-like procedures, the actuarial review depends on specialized expertise, the internal control structure tends toward the verification that qualified and experienced actuaries are making reasonable and informed decisions. One such control is the peer review concept.

4.2 Peer Review

The peer review may take the form of both technical review of formulas and overall actuarial review of judgment. The technical review is particularly relevant in cases where there is a manual calculation process in place, one that has not been converted to a software application such as Excel. Although increasingly uncommon, we have observed such processes, and the potential for mis-statement from human error is easy to envision. However, this is readily solved simply by having another individual do a re-calculation of significant steps in the process to ensure the calculations are correct. Even in an automated environment, however, there is potential for errors to be made in creating formulas; this will be discussed in more detail below.

The more difficult environment to control is that of an actuary's thinking. We have all heard the axiom that ten actuaries with the same set of facts and data points will produce ten different outcomes. If all ten actuaries are qualified, how does one know whether all outcomes are valid or whether one is a rogue indication designed to mis-state results? From an internal control perspective, options include review of the work by another actuary or an independent, complete analysis using the same data.

When one actuary is reviewing another actuary's work, it is important that both are recognized as having the appropriate qualifications to perform the work and make the

necessary judgment calls. It is also preferable that there not be a direct "chain of command" between the two actuaries; if the direct supervisor is reviewing work as a peer reviewer, there may be a perception that such actuary has undue influence to determine the final results of the analysis. This is not to say that supervising actuaries should not be involved in reviewing analyses, but rather that the peer review function might be best achieved outside that chain of command. However, when there are multiple levels of peer review and other types of controls surrounding the reasonability of an actuary's assumptions, we have observed peer review within the chain of command functioning acceptably.

The appropriate depth of a peer review is an important consideration. In the past, documentation of a peer review has likely been non-existent but in the current environment providing evidence of a review and what was actually reviewed is necessary. Items to contemplate include what methods were utilized, whether loss development patterns and a priori loss ratios are sensible, whether reasonability checks of the resulting estimates were examined, and the like. A checklist is a perfectly valid approach to documenting these considerations, but best practice is that the reviewer actually provide comment, and not simply be required to check off boxes.

Another control that may be implemented is using another qualified actuary to perform a separate, full analysis using the same data to determine whether similar results are obtained. Depending on the size of the organization, pricing actuaries may be asked to perform a reserve review, or a "corporate actuarial" department may exist to provide such analysis. Alternatively, the company may hire a third-party actuary to perform the analysis. In practice, due to resource or monetary constraints, this seems to be a control that is used on an annual basis, rather than a quarterly basis. We observe that this control is effective only if performed in a timely enough manner to influence the results for the financial statement date in question.

Whatever form of peer review is implemented, it is important that a mechanism be in place to resolve differences of opinion between the original actuary and the peer reviewing actuary,

should any such differences arise. This may take the form of written guidance on a materiality threshold for differences, and the steps to take when that threshold is breached.

4.3 End User Applications and Spreadsheet Control

One aspect of SOX that has been the subject of widespread confusion is controls over end user applications. End User Applications ("EUA's") are computer applications that are not subject to controls that are common and standard in IT organizations. These would include spreadsheets such as LOTUS or Excel, word processing documents like WORD and WordPerfect, and database applications commonly used in actuarial departments, such as Microsoft Access. The issue involves the fact that controls such as change control, end user signoffs, and backup and archive may not be followed by the end users. SOX requires appropriate controls be in place around EUA's that are used for financial reporting or feeding information into financial reporting systems. Use of these controls for applications not used in financial reporting may still be a good idea, but that is not a SOX issue.

Controls should be in place to avoid inadvertent errors. These errors can arise from many causes, such as inadvertent changes to formulas, corruption of data, loss of important final versions of calculations due to mechanical or human error. Controls that should be considered arise from the risk assessment and are aimed at addressing risks such as these.

The reason that such controls may not be followed are twofold: the user may not be aware these types of controls are appropriate to consider, or the user may have determined that the value of the risk mitigation obtained from operating these controls are not worth the cost in time. This paper can assist with the first, but the second is an issue that actuaries will continue to wrestle with, and SOX changes the value equation somewhat. Actuaries use spreadsheets extensively, and so these are usually the main issue, but database applications are a close second.

In implementing EUA controls, actuaries need to first consider which applications are subject to these controls, and the level of risk which needs to be addressed. The first consideration is whether the application is used in financial reporting. Applications which are used in calculating balances used in financial reporting are subject to the Act, as well as applications which provide significant input to the calculation of balances used in financial reporting. An example of this might be a price monitoring spreadsheet. Changes in prices may not be directly reported in financials, but if changes in prices are used in the reserving calculations, they are likely still subject to Sarbanes type controls; the output of the price monitor may be critical input to the reserving calculations, and reserves are reported on financial reports.

Actuaries should also consider the level of risk presented by an application in determining the appropriate level of controls. For example, a spreadsheet where users enter notes and comments into cells to document considerations, but does not have extensive calculations may not present much risk of formula corruption. However, if a spreadsheet is used to perform the main reserving calculations and select balances to record, tight controls over the accuracy of formulas may be appropriate.

Depending on the risks presented by applications, the following controls should be considered:

1 ***Backups***- Back up of applications with sufficient frequency such that critical information would not be permanently lost if files are accidentally erased or lost due to failure of the storage medium;

2 ***Archiving***- Ability to retrieve final approved versions without concern that later activity may have altered data or that the files have been accidentally lost;

3 ***Formula locks***- Protection of spreadsheets against accidental changes to formulas that should not change in routine use by locking of the appropriate cells;

4 ***Peer Review***- While not specifically an IT control, there is significant value in having a peer review to catch mistakes in spreadsheets or other EUA's;

5 ***Baselining***- The concept here is that change controls might be in place, but a thorough review and sign off at some point in time to ensure accuracy of the application to begin with may be an important control, and this is known as "baselining" the application;

6 ***Security***- Storage of files in a secure location so that only individuals with reason to work with the files have the ability to retrieve and/or save the files.

Many actuaries implementing SOX feel these provisions can be onerous, and SOX teams have been known to go overboard in requiring controls. One of the most hated controls is the locking of formulas. A reasonable way to implement the "locking" control would be to lock only formulas that shouldn't change. For example, calculation of a development factor likely wouldn't change from time to time; after all, a five year average is a five year average. However, selection fields may not be appropriate to lock, even if formulas are present in those fields, since they are expected to change during the course of analysis.

4.4 Management's Best Estimate vs. Actuarial Best Estimate

Accounting guidance stipulates that management is required to book its "best" estimate of loss and LAE reserves. It is generally accepted that the company's booked loss and LAE reserves will be within their actuary's range of reasonable reserve estimates but that does not imply that management's best estimate must equal the actuary's best estimate. There could be a variety of compelling reasons for management to record reserves that are not exactly the same as the actuary's best estimate. These often relate to operational changes within the company, e.g. changes in claims settlement or case reserving philosophy in the claims department, which increase the variability associated with an actuarial analysis and make it more difficult to select a point estimate. Similarly,

qualitative information regarding legislative changes that have recently occurred may not have been fully quantified within an actuarial analysis. Management may also have hindsight evidence that their actuaries have consistently been either relatively optimistic or conservative in their assumptions, and management may wish to adjust for such observation.

The intent of an internal control framework that ensures financial statements are not intentionally mis-stated would suggest that management should have a compelling reason for its best estimate, as suggested above, rather than booking whatever it feel likes. The goal is to prevent management from changing its philosophy on booking reserves on a whim, in order to achieve targeted financial results. The compelling reason must be documented and quantified as much as possible.

In practice, such quantification by management has proven to be quite difficult. We are observing many companies whose recorded reserves previously differed from the actuary's point estimate now booking to the actuary's point estimate. However, there are exceptions, and with legitimate reasons and a robust discussion of those reasons, differences between management and the actuary may remain.

Reserve Committee

While a formal reserve committee seemed to many a good practice prior to 2002, the emphasis that Sarbanes-Oxley internal controls give to documentation and management review has led many companies to fulfill these needs with a formal reserve committee structure. Best practices for committees in general, and specifically for providing controls under SOX 404, would include the following:

- A charter spelling out the charge and operation of the committee;
- A well documented actuarial estimate prepared prior to the committee meeting including a best estimate and reasonable range;
- Executives from Finance, Underwriting, Claims, Senior Management, and Actuarial;

  - Other key executives may attend, such as Legal, Planning, and Operations;
- Active questioning by the committee (not a pro-forma approval process);
- A well documented outcome via minutes including the reserve balance approved;
- Documentation of any departure of management's best estimate from actuarial estimates prepared by committee members or the actuary.

4.5 Documentation Issues

Implementation of SOX 404 involves a degree of documentation that often goes beyond what felt natural to the reserving actuaries in a "pre-404" environment. When a certain procedure is documented as a control, formality that may be expected would include:

- The frequency should be documented (quarterly, monthly, annually, and so forth);
- Documentation regarding the ***control performer*** and the ***control reviewer*** should be kept, along with their respective sign-offs;
- Evidence that the control operated should be retained, such as a reconciliation sheet, approval e-mail, and so forth;
- The end result, or ***control evidence*** should be formally signed-off, and the sign-off maintained.

Usually, how the control is to be evidenced, including the considerations above, should be documented as part of the control itself. Many companies keep a binder with controls indexed on the binder tabs. In this way the control evidence is simply inserted into the binder when complete, and is always available for internal and external auditors, testers, and other interested parties. A separate binder can be kept with the frequency of the main actuarial reserve review cycle, whether monthly, quarterly, or semi-annual. Another separate binder might be kept for each closing cycle. This type of formality comes more naturally to professionals in accounting disciplines, and it can take several cycles

operating with this type of formality before it becomes a natural part of the process for many actuaries.

Controls should be worded very specifically to ensure effective operation. For example, a control worded:

"triangles are reconciled"

would be seen as inadequate. We consider it better to word a control such as:

"Each quarter the outstanding and paid losses in the triangle reports are reconciled to the general ledger. This is performed by the actuarial analyst and documented on a reconciliation sheet kept on the actuarial server. The analyst signifies successful reconciliation with an e-mail to the actuarial manager, who signifies approval by an e-mail to the department that the triangles are available for use."

One would then count three pieces of control evidence: the reconciliation and two e-mails. As an aside, some have interpreted control evidence as needing to be printed and signed in ink. This is not necessarily the case, as long as a secure, backed up electronic mail system is available to maintain the evidence.

4.6 Differences by Size of Company

Most public insurance companies are sizable, and as such, support relatively large actuarial departments. For these companies, while there may be a debate as to the benefits gained from implementation relative to the costs, these companies are the most likely to have the resources to meet the objectives of section 404.

Smaller insurance companies may only have one or two actuaries on staff or even no actuaries at all. For these companies, the most significant challenge appears to be the concept of an effective peer review. For those companies without any actuaries, the solution seems straight-forward, if expensive. These companies would be expected to

hire a third-party actuarial firm to perform the reserve reviews, with a spectrum of detailed vs. high-level analyses for each quarterly reporting date.

For those companies with only one or two actuaries, the actuarial work is likely performed in-house, but that potentially leaves no resources for peer review. In such situations, the key is thorough review by those professionals within the organization that would have the most knowledge of the business – senior claims and underwriting management. Evidence of discussion of the reasonability of results, including challenges to the results if necessary, may be sufficient confirmation of the existence of peer review. Even in such cases, a third-party actuarial analysis may be beneficial in an internal control context.

Should the NAIC implement its "SOX-like" standards for all insurance companies, the issues facing smaller companies may gain deserved attention.

4.7 Status of Implementation

For most large domestic US entities subject to SEC regulation, known as "accelerated filers" the implementation of SOX 404 happened in 2004. Companies should check the precise criteria to determine whether they are accelerated filers, but in general, a public float greater than $75 million and greater than one year of SEC regulation would qualify a company as an accelerated filer. In September of 2005 the SEC delayed implementation on the remaining filers. For domestic US and foreign "non-accelerated filers", the deadline is the first fiscal year ending after July 15, 2007. For foreign accelerated filers, the deadline is the first fiscal year ending after July 15, 2006. Some large foreign accelerated filers have elected to comply early, and some large foreign companies not subject to SEC regulation have elected to implement section 404, including even the auditor attestation. This is quite remarkable given the cost required to comply.

Currently the National Association of Insurance Commissioners ("NAIC") is examining proposals to implement "Sarbanes like" internal control requirements on the insurance industry that is under its regulation. The current proposal is still under consideration by the NAIC in consultation with the American Institute of Certified Public Accounting ("AICPA"). In the current form, the rules would require companies with over $500 million at the legal entity level to file a report, and that report would not be required to be subject to external audit. This would affect about 190 companies that are not already affected by the SEC requirements, and would first be effective for the year ending December 31, 2009.

5. CONCLUSIONS

The Sarbanes Oxley Act of 2002 changed the landscape in which reserving actuaries operate. The provisions of section 404 regarding internal controls provide both a source of additional risk for the actuary, and a means to mitigate that risk. To the extent that history shows certain biases in reserves, the internal controls that are strengthened under section 404 have the potential to address such biases. The implementation of the Act will also increase the documentation burden on actuaries, but in a way this new burden for actuaries is fairly consistent with the approaches used in accounting functions even prior to the Act. In implementing the provisions of section 404, actuaries should consider controls within the actuarial function regarding data reconciliation and quality, performance and review of analysis, and documentation of the actuarial best estimate. They should also look outward to other functions that could impact reserve considerations, such as the management decision process and reserve committee, as well as controls affecting claims, underwriting, finance, and operations.

At its worst, section 404 increases the burden and process overhead for actuaries in reserving functions. However, at its best, implementation of these provisions can strengthen the accountability and accuracy of final reserve decisions, and leave records as to how and why reserve decisions are made. To the extent this strengthens accuracy of

reported results, stability in true company results for shareholders and in premium levels to insurance company customers will be enhanced.

6. REFERENCES

1 Institute of Internal Auditors, "Tone at the Top", issue 28, November 2005, www.COSO.org.

Abbreviations and notations

AICPA-American Institute of Certified Public Accountants
COSO-Committee of Sponsoring Organizations
EUA-End User Application, usually a computer application
FASB-Financial Accounting Standards Board
LAE-Loss Adjustment Expense
NAIC-National Association of Insurance Commissioners
PCAOB-Public Company Accounting Oversight Board
SEC-Securities and Exchange Commission
SOX- Sarbanes Oxley Act of 2002
SOX 404-Section 404 of the Sarbanes Oxley Act

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