Actuaries may work for companies and clients, but they should never lose sight of the impact their work has on unintended users.

The IMPRESSIONS We Make

By Tom Bakos

ALL PROFESSIONALS REALIZE AT SOME POINT that there is really no effective way to isolate their work or themselves from greater scrutiny than they intend. No matter how hard professionals try to build fences around what they do, there's likely to be some unintended recipient who conjures up an unintended conclusion from whatever he sees, hears, or reads. And that conclusion may lead that recipient down an unintended path to an unintended place.

Since an actuary's work is usually intended for the company or client that's paying him, a casual user isn't likely to recognize any special circumstances or assumptions that the intended user understands. Taken out of context in this way, it's not difficult for a professional's work product to be misunderstood or misused.

Still, even those who aren't directly involved in a given work assignment should be considered. These people may be direct or indirect *beneficiaries* of the work done for a client, and it may be inappropriate to even try to fence out their interests or concerns. That's why all professionals work within a framework of regulation. This regulation imposes duties and responsibilities on professionals and implies a broader context for their work product.

We actuaries consider ourselves professionals. We have strong principles (the Code of Professional Conduct), and we measure ourselves against self-set actuarial standards of practice. We obligate ourselves when we join the ranks of professional actuaries to comply with the code and to follow the standards. And since these are *self*-set, we are, I think, under great obligation to follow them in principle as well as to the letter.

The actuarial profession, through the American Academy of Actuaries' Council on Professionalism, produces discussion papers that reflect on concepts of professionalism. These discussion papers might be thought of as the equivalent of "practice notes" on professionalism. Though they provide no definitive guidance, they're intended to stimulate thought and discussion on the alternatives available to each actuary who may be considering how best to apply the spirit of the code and the standards in unique situations not specifically addressed by them.

For example, in order to provide a framework in which actuaries might consider appropriate precautions in connection with the use of their work products, the Academy's Committee on Professional Responsibility has published a discussion paper aptly titled: *The Actuary's Relationship with Users of a Work Product.* It's intended to be both useful and thought-provoking in helping actuaries consider their individual and collective relationships with users of actuarial work products.

Under the term "users," the discussion paper includes not just the obvious principal recipient of the actuary's work product but also other users (auditors, regulators, business associates of the principal, lending institutions, rating agencies, courts, and others) who may rely on, refer to, or depend on the actuary's work with or without the actuary's knowledge. Any actuary involved in work in which this might occur ought to think about this issue and may find the discussion paper a good starting point. The paper is available on the Academy's website, www.actuary.org.

Impressions

All of this has to do with a concern about the impressions we actuaries create by the work we do. The impression an individual actuary makes on his or her principal is, of course, important for many reasons. The impression the general public has of

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actuaries, however, to the extent it can be known or discerned, is important to the profession as a whole.

This subject has taken on more importance recently because of the success the profession has had in increasing its public visibility. Pension actuaries, in particular, have received more media and legislative attention in an environment in which an aging population, concerned about retirement, crashes into the financial insecurity created by an economic decline.

Actuaries working for life insurance companies, however, have also had to deal with the greater visibility. The valuation and illustration actuary certification requirements highlight the role actuaries play in the companies that employ them. The reviews these actuaries must conduct in order to provide the required certifications are done, specifically, for their principal, the insurance company that retained them either as employee or consultant.

However, one can fairly conclude that their work product is intended to ultimately benefit the policyholders of those companies. After all, the regulators who imposed these requirements are charged with protecting the interests of the policyholders residing in their state. So while these certifications are done by actuaries as employees of or consultants to a company (similar to what an enrolled actuary does with pension plans), the effect and import of the actuaries' work covers a broader area and affects more people than the limited scope of the assignment.

Unfortunately, all this has occurred in an increasingly litigious climate where people are more inclined to assign blame elsewhere than to accept personal responsibility for their decisions, choices, actions, or predicament. So even if a profession diligently follows its codes and standards, it may still, unfairly, get caught in this trap.

I'm not suggesting that victims don't exist, only that victimhood is a role often created by costume rather than reality. For actuaries to avoid, to the greatest extent possible, a real villain's role in this unfolding drama they must be aware of and recognize the needs and expectations of *all* of the users of their work product—those with whom they have a direct relationship as well as those with incidental relationships to the work they do.

Creating a Framework for Understanding

Sometimes, the failure to meet expectations results in disappointment, and it's that disappointment that leads to demand for accountability, remediation, and assignment of guilt. Actuaries need to create an environment in which they're recognized for the work they actually *can* do, rather than condemned for doing something they can't do. Actuaries need to help those unfamiliar with actuarial concepts better understand how they apply by clearly specifying the context of the work's intended use and consciously recognizing the needs of all interested parties.

For example, much of the time what actuaries provide are financial models that, in some way or other, *appear* to predict future financial events. When actuaries price insurance products, they use a modeling approach to *project* (not predict!) future contingent claim payments based on an assessment of prior experience data and its likely impact on the future.

That is, they make assumptions based on experience data. Using this stream of possible future claim results, a corresponding offsetting stream can be determined that will provide adequate premium revenue to properly fund the benefit stream. This is called pricing. And the pricing calculation is a model of sorts.

Similarly, pension actuaries, when they determine appropriate funding levels for pension plans, are using a modeling approach. That is, they're applying assumptions in a mathematical process meant to find an equilibrium between funding and benefit payment levels.

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Valuation actuaries also apply a model to determine appropriate reserve levels for the liabilities of their companies. Because of the impact of regulation on the work of pension and valuation actuaries, however, they often don't have complete freedom of choice with either the assumptions used or the model in which they're applied.

These modeling techniques are *deterministic*—they apply a fixed set of assumptions in a structured modeling process to get a result. The same result will come out of the model each time the same set of assumptions is put in.

Typically, actuaries qualify the work they do in this regard with a lot of "ifs"—*if* the assumptions are realized, *if* the model used is an accurate reflection of reality, etc.—because many people who look at our work products seem to believe that actuaries can predict the future. Though it's obvious to us that we can't, we ought to take special precautions to make sure we don't give the appearance that we can.

Interestingly, a *stochastic* modeling process, which involves using a large number of equally probable random assumption sets to project a multiple of results from which a reasonable range of probable outcomes can be determined, naturally gives a better indication of what actuaries are doing when they model.

A stochastic model will show, for example, that for a thousand randomly chosen inputs, a range of results can be found that fit within a probability distribution. So, by using a stochastic model, the actuary will get results that will allow a determination of what the future will look like, say 80 percent, 90 percent, or 95 percent of the time, depending on how much risk aversion the principal has. The future will, of course, be fuzzy since the modeled outcomes will fall within a range of possibilities, no one of which can be certain.

Scientifically, it could be argued that it's unreasonable for anyone to expect that actuaries, or anyone else for that matter, can predict the future—even a future financial event. The laws of physics dictate this even if common sense does not.

The short version of Heisenberg's Uncertainty Principle indicates it's impossible to predict the future behavior of any individual atom, so the future of anything cannot be predicted. What can be predicted, however, with some accuracy, is the *average* result of a large number of independent trials.

Heisenberg's view of the physical world is that the future is like a probability distribution. Similarly, stochastic modeling, given a practical place in the actuarial arsenal by the advent of computing technology, more clearly indicates what's actually going on in the minds of actuaries when they project future outcomes. Actuaries are merely projecting a probable future outcome or, at least, an outcome that's within a range of reasonable possibilities. They're *not* predicting the future.

Actuaries who give the impression that they can eliminate all future risk and predict the future are misleading their audiences, even if they do so unintentionally. And since predicting the future seems to be what people, in general, expect of actuaries, it's not hard to give the impression that we can. More likely than not, people see themselves living in a deterministic world, not a probabilistic one. Therefore, they expect certainty from actuaries. But actuaries, in analyzing future contingent events, are actually involved in a process designed to *minimize* future financial risk, not eliminate it.

If the object were to eliminate all future financial risk, there would be no need for actuaries; the only way to eliminate all future financial risk is to assume the worst case in your model. By assuming the worst case you would be assuming the largest financial consequence possible, no matter how unlikely.

This might be, for example, an immediate claim payment of $1 billion for the 1 million lives you've insured for $1,000 each. Therefore, to eliminate all future financial risk you ought to set up a reserve of $1 billion for the worst case.

Of course, the cost of providing for the worst possible outcome would be prohibitive in most situations. Therefore, actuaries are required to balance cost with risk, to find a bearable cost that provides a satisfactory reduction in individual risk.

So actuaries set up reserves that reflect the expected deaths based on reasonable mortality. They may set a reserve of, say, $1 million based on the reasonable model. Clearly, a $1 million reserve will handle 1,000 death claims at $1,000 each. Financial risk still exists since, in fact, more than 1,000 could die, resulting in claim payments in excess of the $1 million reserve. But if the model is a good one, the risk associated with this would be small.

Much of the work product that actuaries produce involves finding that balanced answer. We just need to make sure that our work product users understand that our work reduces individual financial risk. It doesn't eliminate it.

Members Make or Break a Profession

The Academy, through the Council on Professionalism and its various committees, promotes professionalism among actuaries. The code and the standards are the ultimate determiners of acceptable professional behavior. However, even though they're reviewed, modified, and augmented to keep them current with a changing environment, they're necessarily broad in scope and somewhat general in the guidance they provide.

Clearly, a cookbook approach to writing standards would both be a practical impossibility and show little respect for the profession's individual members.

While the many volunteer members who do work for the Academy and its staff contribute to a public image of the actuarial profession, it's ultimately its individual members who control the profession's public image. The work members do for the principal users of their work product and for others who may be indirectly affected by this work will leave a lasting impression. We should all be mindful to make it a good one. ●

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