

## **A Proposed Policy Change in the Society of Actuaries Education and Examination Program**

Dick London, FSA

### **A. INTRODUCTION**

At the present time, the Society of Actuaries, through its Education and Examination Committee, follows the practice of establishing an "official" reference text for each of its Associateship examinations beyond Courses 100 and 110. This official reference policy has been in use for many years.

In contrast, with regard to Courses 100 and 110, the Society's Associateship Catalog presents a half-page list of specific topics which constitute the subject matter for each exam. The description of covered topics is then followed by a short list of alternative references, any one of which can be effectively used by the exam candidate. The list of alternative references is intended to be representative, but not exhaustive. This policy for Courses 100 and 110 might be called an alternative reference policy (ARP), in contrast with the official reference policy (ORP) used for the remainder of the Associateship exams.

It should be noted in passing that the Joint Board for the Enrollment of Actuaries has adopted an alternative reference policy for its examination program.

The official reference policy has been in use for many years, and no doubt its proponents can advance an argument for its past, and continued, use. It is the opinion of the sponsors of this proposal, however, that an alternative reference policy is superior to an official reference policy in many ways, and it would be appropriate to make a policy change at this time.

The second section of this document details several arguments in favor of ARP over ORP. The third section identifies some potential implementation problems attached to the adoption of ARP, and suggests ways of dealing with them. The final section summarizes the proposal.

## **B. ARGUMENTS IN SUPPORT OF THE PROPOSAL**

There are at least five reasons why the actuarial profession would be better served if the current official reference policy were replaced by an alternative reference policy. These reasons are described in this section.

### **1. Aside from more practical arguments to follow, philosophically the official reference policy is very unprofessional, in and of itself.**

The adoption of an official reference for a given topic appears to constitute an endorsement of that reference by the SOA, which is an inappropriate statement for it to make. A scientific, learned body, which the SOA considers itself to be, should encourage and foster the continued development of its science. The adoption of an official textbook on a given topic implies that we have arrived at a final answer, at least for the time being.

The end result of ORP is that candidates are examined on a particular book, *per se*, rather than being examined on the topic. Since success in the exam program is SOA's criteria for granting professional credentials, it follows that credentials are awarded for demonstrating sufficient mastery of a certain text, rather than of a topic.

The elevation of a particular textbook to "official" reference status has the effect of establishing the contents and views of that textbook as a kind of dogma. The concept of dogma is appropriate for churches, and possibly for social and fraternal clubs, but not for professions and professional societies.

Discussion with members of other professions reveals that our quaint practice of using official references is viewed in an unfavorable light. In general, professionals do not consider this a very professional thing to do.

### **2. The SOA would have a more meaningful and valid credentialing practice with ARP.**

Several years ago, when the SOA introduced its flexible education system (FES), spokespersons for the SOA stated that historically its education and examination process had been "exam driven," and FES would go a long way forward creating an "education driven" process, which was a stated goal. It is submitted here that ORP also leads to an "exam driven" process, and that ARP would make an even greater contribution to achieving an "education driven" process than did the adoption of FES.

On occasion, outright inaccuracies are contained in SOA's credentialing process because the exam is based on a specific text rather than on the scientific truth of a topic. An excellent example of this was present in the November 1988 Course 135 exam, which was based on the Third Edition of *Numerical Analysis* by Burden and Faires. The examiners wished to test the candidates' ability to perform an

approximate integration by the composite midpoint rule. If the exam had *not* been text-specific, the question could have been stated straightforwardly, with credit given for the correct answer. In this case, however, the Third Edition of that text had a peculiar (some might say incorrect) definition of the composite midpoint rule, so it was necessary for the exam question to include the phrase "as defined in the syllabus textbook." This is just one of several cases where the official text was off base, whether due to being outdated or otherwise, so that the exam candidate was being examined on outdated, unusual, or even incorrect information, rather than being examined on the truth.

An alternative reference policy would put in place a mechanism to push the nature of exam questions in the direction of broader issues, requiring a measure of integrated thinking, and away from narrower, formula-oriented questions. Exam candidates should understand, for example, the properties of a stable population model, and they should be expected to demonstrate that knowledge via a written exam. They should not be expected to reproduce any one particular textbook's formulas or notation regarding that model, nor should an exam question be presented in notation or terminology that is text-specific.

### **3. ARP would foster a better relationship between the SOA and the academic community.**

A fairly frequent theme of SOA presidential addresses, editorials, and statements of candidates for election to SOA offices is that of enhancing the academic branch of the profession, and improving the relationship between the SOA and the college and university programs. Efforts to attain this goal have included waiver of meeting registration fees for academics, and grants for encouraging new doctorates in actuarial science.

It is submitted in this proposal that a change to ARP for the exam process would constitute a significant step toward a better relationship between the SOA and the profession's academic branch.

Generally speaking, academicians are uncomfortable with the idea of having curriculum design and textbook selection strongly influenced by an outside agency. Such outside influence simply flies in the face of academic freedom. On the other hand, most academic actuaries realize that the Associateship exams are text-specific, and they are sensitive to their students' ability to be competitive on the exams. Thus they frequently face the unpleasant choice between penalizing their students' career progress on one hand, and a loss of academic freedom on the other.

An alternative reference policy would allow academic programs to take into account the broad scope of topics on the SOA exam in making their course content decisions, but to then fill in the details of their course content, and to select one or more course textbooks, with a full degree of academic freedom.

In general, professional academic education should encourage a broad-based, concept-oriented, integrated thinking approach. The SOA exam credentialing program, with its official reference policy, steers the student in a narrow, fact-oriented, segregated thinking approach. These two approaches are at odds with each other, and it is the opinion of the proponents of this proposal that the former is the better one. A change from ORP to ARP would reduce or remove this conflict.

**4. ORP retards the development of quality educational literature, and, conversely, ARP would foster such a development.**

This is perhaps the most important reason for the SOA to abandon its traditional policy. For many, many years, educators, students, and SOA education and examination personnel have lamented that many actuarial texts have been out-of-date, or have had inadequate coverage of their topics, or have had a poor pedagogic presentation, or some combination of these defects. Recognizing that various factors might contribute to this sad result, it is the opinion of the proponents of this proposal that a major contributing factor has been SOA's policy of endorsing an official text.

The mechanism of producing better quality, updated references under ORP is a slow process. Recent examples include the continuation on syllabus, far beyond their useful lifetime, of Miller's *Graduation*, Speigelman's *Demography*, and the First Edition of Kellison's *Theory of Interest*. This inertia is readily understandable; it is much easier to continue an existing official text for another year on the syllabus than it is to search for, or encourage the development of, a superior replacement.

This is in no way intended to impugn the integrity of the members of the various committees. But the current policy inevitably builds in a natural tendency to prolong the use of resource material whose time has passed, so exceptional diligence is required of the committees in order to avoid this result. Conversely, the presence of ARP would provide a natural tendency to supply timely and improved material.

Under ORP, potential authors are understandable reluctant to go out on a limb, in terms of both financial and time commitments, to write a new text on a basic actuarial topic. With a limited market to begin with, very few people are willing to invest in such a project without advanced assurance of syllabus adoption. On the other hand, the SOA is reluctant to make such a commitment before the text is written. This standoff, with both parties having very valid points of view, contributes to the deterioration of our educational literature.

In general, a competitive economic structure works better than a monopolistic one in terms of product quality. If we could obtain only Chevrolets, is it not likely that the quality of the product would

decline until it reached the point where the authorities changed their endorsement and gave official status to Fords.

Under ARP, it is reasonable to expect that potential authors would come forward, convinced that they could write a better text which would attain its share of the market. There is simply no reason to believe that the fundamental economic principle of product quality through competition would fail to work in this area. Witness the large number of three-semester calculus books; why do people keep writing more of them? The open competition for sales in this market provides us the opportunity to select the product which we feel best fits our needs. Conversely, when factors conspire to produce only one textbook on the theory of graduation, for example, we sink or swim with whatever quality it has attained.

#### **5. Adoption of ARP would lead to an increase in actuarial research.**

Another observation frequently heard in the profession is that we need to encourage the level of actuarial research, in the academic as well as the practitioner environment. It is the opinion of the proponents of this proposal that research and the written presentation of that research encourage each other. Although it is certainly true that most original research is initially reported in refereed journals, new thoughts and techniques so reported eventually find their way into the educational literature as well. An enriched environment for the publication of educational literature should contribute to the research activity in the related discipline.

### **C. IMPLEMENTATION ISSUES**

It is seldom true that a proposed course of action has no difficulties associated with it. If the ARP proposal had no down side at all, it would no doubt have been put in place from the beginning. In this section some potential difficulties in implementing ARP are identified and discussed.

#### **1. ARP might be very unpopular with the exam candidate group.**

Proponents of the current official reference policy might argue that a major reason for using ORP is that exam candidates expect to have a specific, detailed description of the scope of the exam. However, although it is commendable for the SOA to be so sensitive to the candidates' position, they should not be in charge of setting SOA policy.

The better view is that ORP is still, in general, an uncommon approach to professional credentialing, so that a new group of entry-level exam candidates would not be expecting it in the first place. This is then reinforced with Courses 100 and 110, so the new candidate in fact must adjust to the

unusual ORP after Course 110. To retain ARP for the entire Associateship series would actually be just what the candidate expects.

An adjustment will be required for those candidates part way through the series, but this should not be a difficult thing to do. Currently a candidate familiar with SOA's exam policy must adjust to the ARP model in order to pass the Joint Board exams.

If the actuarial profession were currently in need of encouraging mathematically talented young people to become actuaries, then perhaps an argument of designing the exam program to their convenience would be more compelling. But that is certainly not the case today. If a change from ORP to ARP resulted in fewer exam candidates, this would pose no hardship for the profession.

In summary, an argument that ORP must be retained in deference to the exam candidates does not appear, to the proponents of this proposal, to carry any validity.

**2. For some of the Associateship exam topics, no alternative references, in addition to the current official one, exists.**

It could be asserted, for example, that the desired content of Course 150 is adequately covered only by the Society's textbook *Actuarial Mathematics*, so that even if ARP were in place there would be no alternative reference to list in the catalog. This is a valid assertion.

For those courses where this assertion is currently true, the Associateship catalog should simply list this sole adequate reference with a statement such as "At the present time, the following reference appears to be the only available reference adequately covering the topics included on this exam." The important issue here is to change the *policy* regarding alternative references. The lack of such alternatives at the present time is largely a result of the longstanding use of ORP. If the policy is changed, the development of alternative references will naturally follow, and the overall result will be a valuable enrichment of the actuarial educational literature.

Of course the unavailability of suitable alternative references for one course should not deter the implementation of ARP with respect to other courses for which such alternatives do exist. The latter case already applies to Courses 120, 130, 135, and 140.

**3. It could be an additional burden on the Education Committees to seek out and identify suitable alternative references.**

This potential burden need not be placed on the Education Committees at all. The identification of suitable alternative references would be an appropriate task for the course consultants, and an easy one for them to accomplish. Furthermore, as new textbooks are developed, it is anticipated that the author

or publisher of a new work would present it to the appropriate reference selection committee for their evaluation of its suitability for catalog listing. This is the procedure followed by the Joint Board in administering their ARP. It would be reasonable for the SOA to establish a procedure whereby the person seeking to have a reference added to the acceptable list bore the responsibility of showing the suitability of the new work.

**4. It will be more difficult for the Examination Committee to prepare a fair and proper exam under ARP.**

Without question the challenge to the examiners will be a different one under ARP than under ORP. It is important that the exam be fair to the candidate group as a whole. Under ORP, it is possible to justify the validity of each exam question by showing the source of the question in the official reference. Under ARP, questions should be set on topics that are generally considered to be part of the course content, and are therefore covered in the alternative texts.

The special challenge to the examiners under ARP actually is an advantage of the proposed new policy, not a disadvantage. The special exam considerations imposed by ARP will lead to greater validity in the credentialing process, as shown earlier in this proposal, by moving it toward an exam "on the subject" and away from an exam "on the book."

The creation of exams that are not text-specific does not seem to be an overly-difficult task for the committees that prepare the Course 100 and Course 110 exams, nor for the Joint Board committees that prepare the enrollment exams. There is no reason why the other SOA committees cannot do as well.

#### **D. SUMMARY AND CONCLUSIONS**

The primary reasons for advocating the change to ARP for the Associateship exams are that such a change would establish an effective and efficient mechanism for enriching the actuarial literature, enhancing the relationship between the SOA and the academic branch of the profession, and evolving a more meaningful credentialing process. Although there are certainly some problems associated with the implementation of the new policy, it is believed by the proponents of this proposal that these problems are not insurmountable.

As an initial step, the SOA could extend ARP beyond Courses 100 and 110 to include a selected few others. The most logical additional ones would be Applied Statistics (Course 120) and Numerical Methods (Course 135). When the "experiment" proves to be easily administered, the policy could be extended to other courses.

It might be appropriate to explain why this proposal is restricted to Associateship exams only. Clearly ARP requires that there be a clear distinction between the topical content of a course and the reference material which present that content. To construct and grade a valid exam on Advanced Design and Pricing, for example, without specified reference material would be considerably more difficult. But the Associateship courses are, or certainly should be, susceptible to a course description prepared independently of any one text that might then be used to study the course content material.

The proponents of this proposal urge the Society of Actuaries, through its Education and Examination Management Committee and its Education and Examination Steering and Coordinating Committee, to give serious consideration to this proposal at the earliest possible opportunity.