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Actuarial Practice and Control: Objectives and Capabilities

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Abstract

In this paper a guiding philosophy for the development of an Actuarial Practice and Control (APC) subject is outlined. However, from this starting point, a more general view of what constitutes actuarial practice emerges.

This paper draws on work completed recently by the author who chaired an Institute of Actuaries of Australia committee established to review the syllabus of the Australian Part II professional actuarial education requirements – the so-called Actuarial Control Cycle - and to make recommendations regarding syllabus changes. Such a control cycle approach is a valuable tool in the development of actuarial education and practice.

An important element of this work is the recognition that there is more to successful actuarial work than the acquisition of a set of technical actuarial tools. A number of capabilities are identified as being pre-requisites for successful actuarial practice. Only a few of these capabilities specifically focus on technical issues. The implications of this recognition are important for the actuarial profession and its approach to its professional education.

A Mission Statement for an APC course is given: *“An Actuarial Practice and Control course provides a structured approach to understanding and then applying the principles of a generalised actuarial approach, leading to the resolution of a broad range of issues in a business and financial environment.”*

A specific Actuarial Practice and Control schematic outlining the structure of actuarial practice is provided and the place of an Actuarial Control Cycle within this structure is clarified. A consequence is that the generic steps involved in applying the Actuarial Control Cycle can be explicitly listed. It also provides a high level conceptual framework which can be used to integrate actuarial education and practice.

Key words: actuarial control cycle, actuarial practice, actuarial education

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1 Introduction

The purpose of this paper is to provide a guiding philosophy for the development of an Actuarial Practice and Control (APC) subject. This subject stands in its own right.

In the Australian actuarial environment, such a subject also plays a specific role in the professional actuarial education process. The subject is termed the Actuarial Control Cycle by the Institute of Actuaries of Australia (IAAust). Actuarial students, enrolled at a university accredited by the IAAust, who pass the subject at an appropriate level, are permitted to gain an exemption from the current IAAust's Part II professional education requirements.

The paper is divided into ten sections, including this section. The next four sections put this work into context:

- **Background.** Including some comment on experience requirements.
- **The Name: Actuarial Practice and Control.**
- **International Context.**
- **Role of Actuarial Practice and Control.** In particular, in relation to the IAAust professional education process.

The following five sections then look at the role of APC and, from this starting point, develop a more general view of what constitutes actuarial practice emerges:

- **Actuarial Practice and Control Mission Statement.**
- **Commentary on Actuarial Practice and Control Mission Statement.** In particular the transition for students from the acquisition of tools to the using of these tools, the need to begin the development of judgement and professionalism is discussed. For many students this can be something of a paradigm shift.
- **Capability Statements.** Work describing a set of capabilities required for successful actuarial practice is summarised. In particular it is emphasised that the technical skills are one of a number of necessary capabilities required.
- **Actuarial Practice and APC Schematic.** A summary of the process at work, placing APC in the more general context of actuarial practice, is then developed. A schematic that summarises the process is also provided. This process centres on the use of models, and then develops a number of layers leading to a basis for successful professional actuarial practice.

It is self evident that, at the level of a philosophical approach, the control cycle approach is not restricted to, or unique to, actuarial education.

2 Background

This work is based on the findings of an IAAust investigation into the syllabus for its Part II Actuarial Control Cycle requirements. The author chaired this investigation and prepared the report of the investigation. The contribution of the members of the committee for this investigation is acknowledged, Gribble et al (2001).

Previous work developing the Actuarial Control Cycle is reported in Knox et al (1995).

The recommendations with regard to revising the syllabus for Part II made in the report Gribble et al (2001) were not accepted in their entirety by the IAAust. The recommendations made in this report are available elsewhere, Gribble (2003), and the final syllabus adopted by the IAAust can be obtained from the IAAust website, IAAust (2002). Upon submission of its final report, in October 2001, the IAAust Committee was disbanded. An exposure draft of Gribble et al (2001) was briefly published on the IAAust website in September 2001. Neither the committee nor any of its members participated in the subsequent IAAust review or the preparation of the final IAAust Part II Syllabus.

The IAAust Part II course, denoted by the IAAust as the Actuarial Control Cycle, is taught on behalf of the IAAust by accredited universities in Australia. As at December 2002 there were four such universities, Australian National University, Macquarie University, University of Melbourne, and University of New South Wales. The accredited universities use a variety of names for their Actuarial Control Cycle courses.

As at December 2002, a brief summary of the IAAust educational requirements is as follows. A student who has successfully completed both the Part I and Part II education requirements specified by the IAAust can become an Associate of the IAAust. The IAAust Part I education requirements cover the standard 'technical' introduction to actuarial studies, with the same structure and covering the same material as the United Kingdom Institute of Actuaries Part I. Students normally complete or are completing Part I prior to undertaking Part II. Students typically attain the Part I by completing courses at an accredited Australian university to a level required to be granted the relevant exemptions for the Part I subjects. The IAAust Part II can only be attained by completing specific courses at an accredited Australian university to a level required to be granted an exemption. The level of competence required to attain an IAAust exemption is higher than that required to be granted by the universities to simply pass the courses. The final Part III and Professionalism requirements for attaining a Fellowship of the IAAust are currently administered directly by the IAAust. There are ongoing Continuing Professional Development (CPD) requirements subsequent to the attainment of a Fellowship.

As at December 2002, it is the case that the only requirement for attaining a Part II exemption is the successful completion of the academic courses comprising APC. It is noted, however, that this subject need not be the only component of a full Part II curriculum of the IAAust education process.

The overall level of learning expected of students taking APC is at about the level required of an Honours level university course. This is consistent with prior work completed for IAAust Part III reviews, which appear to have a higher level of learning required, and the current positioning of the various APC courses by the four Australian accredited universities.

An important and ongoing debate within the IAAust, and within actuarial education worldwide, is the importance of balancing academic knowledge with practical experience and determining at what stage in the actuarial education process experience requirements should apply. There are varying approaches: at one extreme, students in some European countries complete all their education through universities; and at the other end of the spectrum is the situation in the USA with all exams being administered by the professional body. There is a mixture of these approaches in Australia.

When examining the focus on an experience component, in contrast with the provider of the education, there are also a variety of approaches. These approaches range from either ignoring the need, through presuming students may acquire experience on their own (perhaps in response to a requirement for some level of experience to acquire or retain a professional designation), through to structured and explicit management of the experience element of professional education. Co-operative education programs, successfully offered by the University of Waterloo in Canada for many years, are an example of this. More recently, co-operative education as part of actuarial education has been promoted by the University of New South Wales in Australia. The other universities accredited for actuarial education in Australia have no specific experience requirements integrated with their actuarial programs.

In the context of professional education, with skills and knowledge needing to be applied in the business world, the importance of experience is undeniable.

There is also an important question as to the appropriate level of knowledge required to attain, and hold, Associateships or Fellowships in a strong professional actuarial body. The ongoing strength of the actuarial profession depends on many factors, including the level of technical (academic) knowledge, the level of experience, and other professional qualities, such as personal integrity and an acceptance of the need to protect public interest.

While it may be considered important to ensure that appropriate standards are maintained by those entering the actuarial profession, both at the Associateship and

Fellowship levels, it is also important to ensure that such standards are not set at unreasonably high levels, which might result in unacceptable low levels of entry rates. An important aspect in a rapidly changing and evolving professional environment is the need to ensure that ongoing professional competency is maintained – Continuing Professional Development.

No matter what level of entry requirements for a profession may be, the long term viability of the profession depends on the overall ongoing level of competency of the profession as a whole. That is, the CPD regime of the profession is the key to its ongoing viability and strength. The relevance of this to the IAAust Part II, or APC, is that while maintaining good standards at entry into the profession is important, it is not the only, or even ultimately the ‘main’, game. This is a contentious issue in actuarial education, as indicated in comments made by the incoming SoA President, James MacGinnitie, in his Presidential Address, MacGinnitie (2002).

As students move through the actuarial education process, and more current practitioners undertake required CPD, the need to integrate academic knowledge and practical experience provides an ongoing tension in the education process needed to develop and maintain currency for a practising professional.

3 The Name: Actuarial Practice and Control

The use of the Actuarial Practice and Control is deliberate, for the reasons described below and reinforced in later sections.

In particular it is noted that the concept of a control cycle is not unique or specific to the actuarial profession and has been long developed in other disciplines – notably in the engineering and biological sciences environment. At its simplest, a control cycle is simply a feedback loop. A control cycle is a tool to be used to assist with comprehensive ongoing management of issues. It is how the tool is applied that generates its value. In the context of actuarial education, the application of this tool is a powerful mechanism in assisting with the development of competent and professional applications of actuarial skills.

In summary the focus of the course is on the *practice* of actuarial skills and on the *control* of the issue involved. A control cycle is a tool used to support this, but it is not the primary focus of the course in of itself.

An example of this distinction between ‘tools’ and the ‘use of the tools’ might be to note that a textbook written, say, 25 years ago on life contingencies would have been

entitled 'Life Contingencies', and not 'Commutation Functions' which were then the key tool in applying the theory.

A more prosaic example is to consider the distinction between knowing, conceptually, that a hammer is a tool for getting nails into pieces of wood to hold them together, in contrast to having the experience to be able to use a hammer effectively and be able to lay a wooden floor to an acceptable standard. Few would dispute the value of practice and experience in this context – not only from the practitioner's perspective, but also from the perspective of the client who uses the practitioner's services.

4 International Context

There is international interest in the IAAust's Part II course.

This is demonstrated by references to Part II of the Australian actuarial educational system in the International Actuarial Association's (IAA) required educational commitments for membership of the IAA. These minimum standards are to be attained by members or potential members by 2005.

The IAA website (2001) and the Indicative Readings for IAA Subject 9 (Principles of Actuarial Management) include, among others, a reference to the Actuarial Control Cycle of the IAAust.

In a number of countries, including the United Kingdom and the United States, where reviews of actuarial education are being undertaken by the professional actuarial organisations, there is recognition of the value of the overall approach taken by the Australian Control Cycle.

A recent issue of 'theactuary' magazine, the newsletter of the Society of Actuaries in the USA, included the following quote in James MacGinnitie's Presidential Address, MacGinnitie (2002):

'The challenge for the actuary is to communicate effectively with the audit committee [of insurers] ...

*It draws on our emerging work in enterprise risk management (ERM), and on the concept of the actuarial control cycle. The ERM has made great strides in the SoA and elsewhere in the actuarial community. **The actuarial control cycle** was first articulated by my former partner and counterpart in the Institute of Actuaries, Jeremy Goford, and then developed by our Australian colleagues. **It will be the***

centrepiece of our revised education syllabus that the working groups are developing for 2005 and beyond. (emphasis added)

See also Goford et al (2001).

5 The Role of Actuarial Practice and Control

From the perspective of the IAAust, as a professional body, APC has two roles, which are distinct but should be complementary:

- Preparation for Part III subjects, reflecting the path to Fellowship;
- Providing a working knowledge of actuarial principles and techniques, so that a candidate can apply the technical knowledge gained in Part I to problems at a level sufficient to justify the qualification of Associateship of the IAAust.

The second of these roles is in the nature of a minimum requirement.

These roles recognise the leading direct stakeholders in the IAAust education process – the IAAust, the accredited universities and the students. However there are other stakeholders, not directly represented, who require consideration – industry and employers, and the public to name some.

From the perspective of educational institutions teaching APC, there may be additional issues regarding the courses that support APC. These courses need to fit into the academic programs offered by the institution and abide by the pedagogical and management requirements of that institution. The courses may be part of other academic programs.

Comments here are in the context of the universities accredited by the IAAust to teach APC, as only these universities have a defined interaction with the IAAust and its professional education program.

The IAAust Part II and IAAust Actuarial Control Cycle are often regarded as synonymous in the context of the educational system by the IAAust. Conceptually, this is not necessarily appropriate. An APC subject should be regarded as one component of Part II of the IAAust educational system.

Part II follows on from Part I, and culminates in the awarding of an Associateship of the IAAust. Essentially, Part I of the IAAust education system, in common with the initial actuarial education provided worldwide, provides students with a set of technical and

mathematical tools. Part II in the IAAust context, the APC more generally, starts the process of integrating these tools with the needs of professional actuarial practice. Elements that need to be considered in the awarding of an Associateship include:

- Technical / academic knowledge required;
- Ability to apply technical knowledge to imprecise problems;
- Communications skills;
- Professionalism; and
- Experience requirements.

This paper provides a rationale which encourages the integration and recognition of the importance of all these elements. Historically, actuarial education has tended to focus on the first two of these points. While reference is made to the third and fourth points, these points deserve to be considered separately in their own right in the context of practising in a professional business setting. It is worth noting that both the United Kingdom Institute of Actuaries and the Society of Actuaries require completion at a professionalism course in order to attain an Associateship, as well as successful completion of a further required professionalism course to attain a Fellowship.

There is little debate as to the value of experience, the fifth point, but it is not often explicitly built into the education process. Currently, perhaps unfortunately, the fifth point is only implicitly considered by APC. No experience requirement is prescribed for entry into APC by the IAAust, and only one of the universities accredited by the IAAust to teach the APC may require some experience through a Co-operative Education program. Consequently there is automatically a limit on the level of experience that can be expected from those who pass it.

Successful completion of APC to exemption standard, in the view of the IAAust (so, to IAAust standards) should provide confidence that the level of technical and academic skills is adequate. Further, it should provide some confidence that actuarial principles underlying actuarial practice have been introduced.

6 Actuarial Practice and Control Mission Statement

“An Actuarial Practice and Control course provides a structured approach to understanding and then applying the principles of a generalised actuarial approach, leading to the resolution of a broad range of issues in a business and financial environment.”

The following discussion builds on that in Gribble et al (2001).

Overall Objective: The aim of an APC course is to provide the successful candidate with an understanding of underlying actuarial principles. These principles provide the basis for a generalised actuarial approach that may be applied to a range of problems and issues in a commercial and business environment. Such issues include, but are not restricted to, those associated with risk-based and other products offered by financial institutions.

Bridge to Business Environment: APC is intended to form a bridge between the learning of specific technical skills in a well-defined environment of initial actuarial education and their application in a less well-defined business and commercial environment. From a technical point of view, APC prepares students to undertake more advanced learning in order to attain full actuarial qualification, typically a Fellowship. Candidates are expected to begin developing the judgement and professional skills required to successfully apply actuarial principles in such a setting.

Practical Capabilities: APC facilitates a transition in the student's approach to learning in that it requires students to develop a holistic approach to practical problem solving. Underlying this is an expectation that appropriate communication skills are in place, problem identification and solutions will be appropriately attuned to the environment in which they are encountered, and professional judgement and ethics will be properly applied at all times.

Not Practice Specific: The subject is not specific to any single area of practice but draws examples and implications from many areas to illustrate and establish the underlying actuarial principles. Areas from which examples are taken include investments, finance, life insurance, general insurance, superannuation and other areas where actuaries are currently involved or may become involved in the future.

7 Commentary on Actuarial Practice and Control Mission Statement

There are a number of specific comments that can be made to amplify the Mission Statement above. As with the Mission Statement itself, some of these were initially raised in Gribble et al (2001).

- **Actuary/actuaries:** Specific reference to 'actuary/actuaries' has been removed. Formally, the word 'actuary' carries connotations of professional Fellowship, etc, which is not necessarily appropriate in this context. Removal of this wording also

opens the door to other students and professionals who may also be able to benefit from participating in an APC course.

- ***Underlying Actuarial Principles:*** A definition of ‘underlying actuarial principles’ is left open. While this could be addressed, for example in the context of ‘assessing and managing risks in a financial environment ...’, this has not been addressed directly.

The concept of what the underlying core competencies and distinguishing features of ‘being an actuary’ or ‘applying an actuarial approach’ may imply have been, and continue to be, discussed for a long time in many venues, without a distinctive clear consensus emerging.

As an aside, a simple test for a characterisation of the essence of actuarial work is whether it leads to a resolution of the question: ‘Why should an actuary be used to address a particular problem - in contrast to a member of a related profession, such as an economist, statistician, etc?’ A significant element of this resolution should focus not on why actuaries can do the job (since other non actuaries may also consider they can also do the job), but why the other candidates may not be able to provide the service that should be expected from an actuary. The topic of developing a marketable and pro-active actuarial identity is a larger topic than APC itself.

However, an encapsulation of what APC should be about could be that it seeks to identify the transferable skills which an actuary (in the making) should have in such a way as to firstly identify the principles and then to reinforce them through examples where they may be applied. If the ‘transferable actuarial skills’ are well understood, then they should be applicable in many areas and not restricted to the ‘traditional’ actuarial disciplines and related areas.

- ***Principles and Application:*** Students need to start moving from the academic environment of initial actuarial education, with clearly defined problems, which have clearly defined solutions, toward a more realistic environment in which problems are not necessarily clearly defined or fully specified. In such environments, a clear understanding of basic principles, together with established examples of their application and an understanding of professional obligations and judgement (and limitations), is needed.

In this context it is considered an important aspect of APC that students develop the ability to do a number of things including:

- Selecting tools and techniques appropriate to problems under consideration;
- Understanding the limitations of the tools and techniques they may utilise;

- Synthesising knowledge and bringing to bear a holistic approach to how problems are to be addressed and analysed.
- **Transition:** A key element of APC as described above is that it is a transition. There is a significant change for those candidates emerging from the initial 'technical' subjects and a preparation for further actuarial education and subsequent professional work. There is, or there should be, therefore, a significant element of 'culture change' for the candidates who enter APC relative to their initial actuarial education. This culture change should, in particular, encompass the need to:
 - Make judgements;
 - Assess materiality;
 - Analyse imprecise problems; and
 - Communicate solutions and recommendations in a manner appropriate to recipients' needs.
- **Preparation for Work Environment:** Previously, some employer feedback solicited by the SoA was mentioned which highlighted the need for more than just technical actuarial skills. This is consistent with feedback provide to the IAAust from two Focus Groups, Meyer (2000), which supports the view that both students and employers would like to see students who successfully complete APC more clearly differentiated from other students/candidates who have not completed APC, by being more fully prepared to participate in a working environment.

One item which was noted was the need for experience. Comments on the question of experience requirements in the context of APC and actuarial education in general have already been made.

- **Development of Professionalism and Judgement:** On completion of APC, students should be expected to be able to apply basic judgement to their work and results. Further, students should also recognise the main tenets and implications of working in a professional setting and understand the need to apply appropriate professional behaviour and standards in their work. This would include, for example:
 - Understanding the limitations of their knowledge and experience and providing advice accordingly;
 - Understanding when further professional help should be sought;
 - Understanding the role of Peer Review;
 - Being able to apply basic 'reasonableness' tests in the choice of tools used, results obtained and conclusions which may be made;
 - Recognising that many users of their advice will not have actuarial training and being aware of the need to communicate conclusions, alternatives, and supporting arguments clearly and succinctly.

- **Outcome Orientation:** In line with the need to better equip APC students in a professional working environment, the Aims, Objectives and teaching focus of APC need to be outcome-oriented. In particular, due consideration needs to be given to ensure that students demonstrate the ability to successfully identify and communicate the main issue and conclusions.
- **Data:** If computation and analysis are completed based on poor or incomplete data then subsequent results may be compromised, independent of the quality of any analysis made. The importance of assessing and understanding the quality of data used, its limitations, and any underlying assumptions or corrections which may have been made is a necessary element of analysis and interpretation of results. APC should give appropriate and ongoing recognition to these issues throughout the course. This is a particular area in which the professionalism and judgement noted above should be applied.

This is an area in which experience is necessary.

- **Breadth of Coverage:** In keeping with the Principles and Applications point above, it becomes essential that APC includes coverage of traditional, non-traditional and emerging actuarial practice areas.

APC is expected to demonstrate and encourage the application of transferable actuarial skills on a broad basis. Specific practice areas to be addressed include, but are not limited to, the traditional areas of actuarial practice.

As materials and expertise from non-traditional areas become available (for example via Practice Committees, Conferences and Meetings, and the academic and research literature), it should be expected that examples from these areas will be integrated into APC on an ongoing basis.

- **APC Presentation Approach:** Consistent with the comments above, the recommended approach to presentation of APC is that it be a problem-based learning approach. The use of case studies and business-based examples, at a variety of levels, is recommended.

In keeping with the 'Principles and Applications' point above it is also expected that the principles of APC will be applied during APC not only in areas of traditional actuarial practice, but also in a broader range of scenarios.

In keeping with the points above, it is also expected that the elements of synthesis, application of knowledge and the development of judgement and professionalism

would be emphasised with a practical business application orientation maintained throughout.

In summary, one way of characterising many of the points discussed above is that the focus moves from the developing of tools to the development and understanding of the use of the tools with examples drawn from both traditional and non-traditional areas. This does not prohibit the introduction of new tools but it does represent a change in focus from initial actuarial education leading toward further actuarial education and subsequent professional practice.

The following discussion of actuarial capabilities is also important in this context.

8 Actuarial Capabilities

To support the Part II Review, and other educational review initiatives, the IAAust commissioned work seeking to identify a set of capability statements for actuarial practice at Associateship and Fellowship levels. See Meyer (2001). The remainder of this section is based on this reference.

The development and documentation of the capabilities at both Associateship and Fellowship levels is intended to allow the profession (and the educational review teams) to:

- Be engaged in discussion and dialogue on the expected levels of competent practice for Associate and Fellow;
- Consider to what extent current initial professional education is adequately preparing actuaries to fulfill these levels of expected capability;
- Reflect on what might need to change in the learning outcomes, content and instructional strategies and requirements of the educational programs that will promote needed actuarial capabilities.

Essentially the capability statements are intended as a tool for reviewing the adequacy of the educational programs by shifting thinking from "*What do we think APC should cover?*" to "*What are we educating for?*" They have been developed to support this outcome-based approach to the curriculum and instructional design of the courses under review.

The statements are not intended as descriptions of areas of specialisation within the profession but rather provide a description of core abilities and attributes across organisational contexts and areas of specialisation.

In reading capability statements for Associates and Fellows it is intended that these are understood within the context of the following list of qualities and attributes needed for highly effective practice. The Associate, for example, in applying technical skills and solving problems, is expected to do so with application of judgement, integrity, business acumen, etc.

The following describes the core attributes of effective actuarial practitioners expected to be evident across Associate and Fellow levels of practice, albeit at varying levels, and developing and growing with experience.

- **Cognitive:** The capacity to make decisions, articulate reasoning, think through issues and analyse and assimilate large amounts of data and construct solutions to problems and arguments;
- **Expertise:** The technical understanding and skills to undertake required analysis as well as product, corporate and financial knowledge of a client's situation to fulfill the actuarial role;
- **Actuarial Judgement:** The capacity to identify and frame a problem and determine a legal, ethical and practical solution that draws on sound actuarial theories, principles and techniques, including the ability to critically evaluate the factors and assumptions that may be operating in the current context and in one's own thinking.
- **Innovative and flexible:** The capacity to identify and use (and, if necessary, create) new tools and techniques to solve problems as well as implement new approaches and methods and identify potential impacts of innovative approaches, including the ability to be flexible and adaptable to work tasks, actuarial problems and organisational changes.
- **Rigorous and Holistic:** The capacity for an individual to be thorough, disciplined, rigorous and systematic in detailed analysis while also able to evaluate implications and relate detail to the big picture, including the notion of materiality and focusing on key drivers, assumptions and issues.
- **Strategic:** The capacity to see issues in context, understand the interplay of external and internal factors on actions and decisions and deal with ambiguity and change; including the ability to be outward-looking and incorporate a long-term

horizon as well as considering issues that may be difficult to express in measurable terms.

- **Integrity:** To have a clear set of ethical values that can be articulated to stakeholders, with the capacity to act with integrity and consistency in complex and challenging situations.
- **Personal Management:** The capacity for the individual to understand his or her own limitations, seek support/advice when needed, plan tasks, monitor own performance, reflect on own practice and learn and develop.
- **Influence and Interpersonal Skills:** The capacity to identify where others are coming from and understand their point of view; get others to see your point of view, negotiate positive outcomes, foster collaborative approaches to achieving outcomes and work effectively with others. This includes the ability to advocate and influence decision makers for achieving ethical and sound outcomes for stakeholders.
- **Communication:** The capacity to communicate clearly and appropriately through written and oral communication with clients and broader internal and external stakeholders, particularly in relation to risks and possible options and consequences. This includes the ability to communicate sound advice offering the role of stewardship for achieving objective and fair solutions for clients and stakeholders.
- **Business Acumen:** The capacity to see business implications in actuarial issues and decisions and articulate the possible risks and benefits for stakeholders, as well as having the perception to identify the key issues and their implications in both a general and specific business context.

The most relevant comments for the purposes of this paper are those relating to the proposed Associate Capabilities since APC is being considered in this context, rather than that of a Fellowship or fully qualified practising professional. It is important to note that these comments are described based on some two years of work experience, are:

An Associate contributes in a professional manner to the provision of practical business advice dealing with defined problems

To achieve this purpose the Associate demonstrates features of the core attributes of the actuarial practitioner and the core units of capability for effective workplace practice. The effective Associate in the workplace:

- *Abides by actuarial professional standards and behaves ethically within own work role under the guidance of a Fellow*
- *Contributes to client management*
- *Applies technical skills to actuarial work tasks*
- *Applies actuarial principles and methods to address defined client problems*
- *Contributes to productive workplace relationships*
- *Applies effective communication skills to support achievement of internal and external client outcomes.*

The realism and practicality of the implication that an Associate cannot function without the guidance of a Fellow, per the first bullet point above, requires further consideration. This is especially the case when actuaries – in particular Associates of the IAAust – are to be encouraged to expand their horizons and move into broader fields of actuarial endeavour.

However, the value of this discussion in the context of this work is that non-technical tools and abilities, and their utilization, are clearly identified as necessary pre-requisites for successful professional actuarial practice.

A recent issue of 'theactuary' magazine, the newsletter of the Society of America, included the following quote in James MacGinnitie's Presidential address, MacGinnitie (2002):

*' ... During the past year we (the SoA) have conducted some extensive market research, particularly among major employers, both current and prospective. While they indicate that actuaries continue to be valuable employees, there is a **shortfall in two critical areas: communication and "business acumen"**. The research highlights the risk that we could become lower-level functionaries in a smaller sector of the economy' (emphasis added)*

A number of these themes have been touched on in the Commentary on the Mission Statement for APC. They can be summarised graphically and made more explicit in the schematic for APC in the following section.

9 Actuarial Practice and APC Schematic

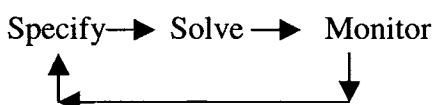
It is useful to have a framework within which APC can be considered.

- **Models:** Fundamentally, actuaries build models. Typically, but not necessarily, these are of financial systems.

We start from a central core of Models, and a presumption that much actuarial work revolves around defining, building, using and interpreting results obtained from, models.

- **Analytic Cycle:** The analytic (technical – full focus of initial actuarial education and an important focus of APC) work can be viewed as a feedback loop (a control cycle) which is applied to the models.

A Model lies at the centre of an ongoing Analytic Cycle, made up of the steps



- **Financial Control:** The major attributes of (financial) models to be considered in financial control and management circumstances are included. In particular, note there is no reference to the usual traditional actuarial disciplines, and no limitation on application in non-traditional areas.
- The Analytic Cycle functions in this technical financial control environment, encompassing things like assets, liabilities, capital, profit and pricing. These topics are set in an amber background in Diagram 9.1.
- **Professional Cycle:** The Analytic Cycle and applications to Financial Control lie within the environment in which actuaries work. This cycle recognizes that solutions require implementation and the focus is on outcomes and practical solutions, which need to be completed in a professional manner.

For the work done in the Analytic Cycle to be of value it needs to be communicated to a wider audience, and must interact with the needs and objectives of that audience. This is accomplished by the Professional Cycle which, amongst other things, requires increased levels of experience and judgement.

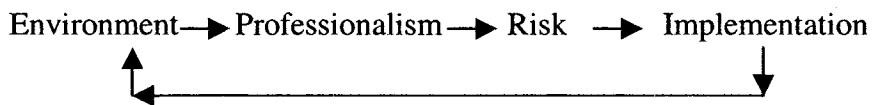
This cycle also specifically recognises the importance of identifying the risks involved. Not only is it expected that the 'traditional risks' be included, such as

contingency and economic risks, but also where appropriate other risks, often coined 'operational risks', are also considered.

One particular aspect of actuarial work which is not specifically included in this description is that of data and assessing data adequacy - quality, completeness, etc. This can be considered to be implicitly included under the 'Risk' heading. The old saying of 'garbage in, garbage out' encapsulates the risks involved in using poor or inappropriate data – no matter how good the modeling structure employed may be.

The fourth step in this cycle explicitly recognises that the implementation aspects of actuarial work are crucial. In this context, perhaps the saying 'Genius is 5% inspiration and 95% perspiration' encapsulates the importance of getting implementation correct.

Pictorially, this is accomplished by enclosing with a cycle:



- **The Actuarial Control Cycle:** The combination of the Analytic Cycle and Professional Cycle, applied in the context of the financial control environment, provides the conceptual toolkit to support an Actuarial Control Cycle.
- **Financial Services:** In a broader context than Financial Control noted above, actuarial work is usually, albeit not necessarily, carried out in the context of financial services of some type. These topics are set in a green background in Diagram 9.1.

The practitioner needs to be aware of, and understand the impact of, seeking to apply an Actuarial Control Cycle approach at a higher and broader level than the Analytic Cycle. This needs to recognise a broader environment, community needs, the roles and perspectives of multiple stakeholders in processes, the consequences of the technical work when it is applied (utilised) in practice.

- **Actuarial Control:** The concept of applying the Actuarial Control Cycle in a financial services environment leads to the idea of Actuarial Control.
- **Capabilities:** This is a separate and different dimension in the development of effective actuarial practitioners in a business environment. Conceptually, these capabilities cross all the boundaries in other elements of the Diagram – providing another dimension.

Surrounding and supporting the Professional Cycle there is a set of more general attributes including judgement and materiality, integrity and ethics, communication and interpretation, intellectual exchange with the broader business and academic community, and business acumen.

Without these capabilities - which lead to the provision of relevant, timely and balanced advice, given in a manner which is understood by the end user in an environment of high trust and integrity – the value of work done may be greatly diminished.

We draw on an analogy to help make the point. Think of the steps outlined above as links in a chain leading from a problem to a resolution, then the strength of the chain is limited to the strength of its weakest link. If the chain is broken then the process fails no matter how strong the unbroken links are.

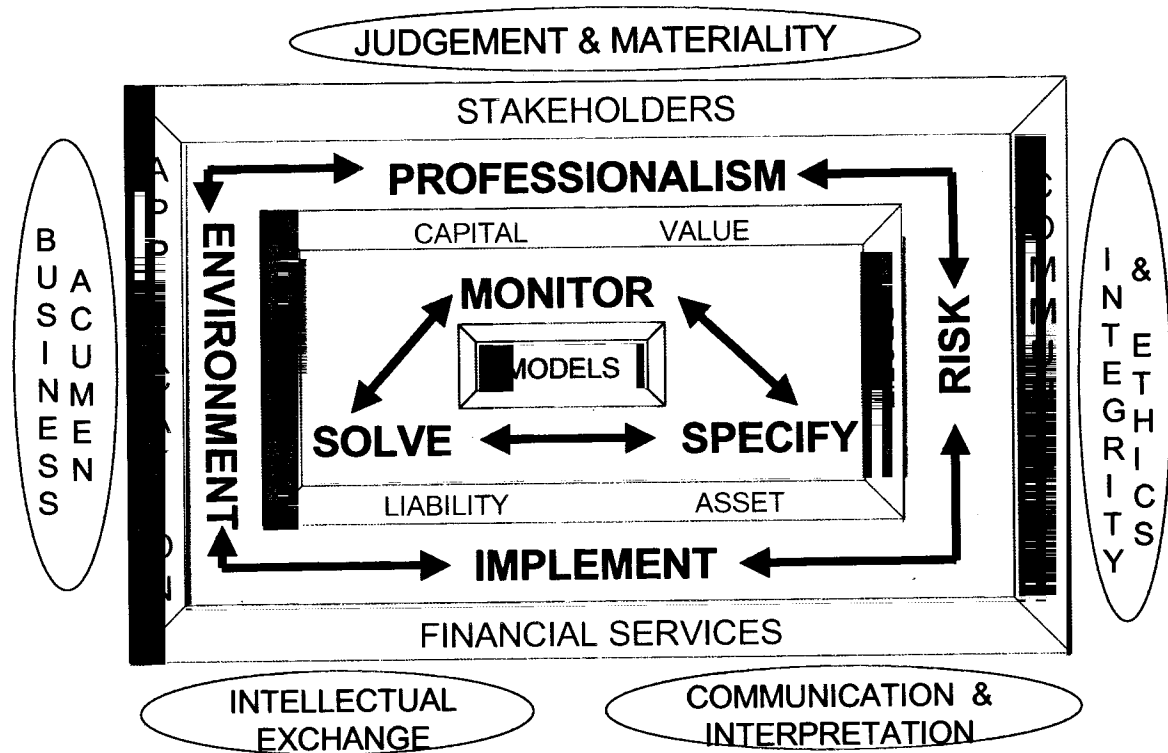
The capabilities, and in particular the communication link in the chain, are thus as important as other links in the chain. Ultimately, if the message is not received then, effectively, it was not sent.

- **Actuarial Practice:** The technical aspects become more outward-looking and the focus moves toward recognizing the needs and perspectives of the multiple stakeholders involved with business issues, and recognizing the potential for application, both within the financial services and more broadly than the traditional discipline areas.

Without the capabilities discussed then Actuarial Practice, at its highest level, will likely be ineffective and not add the value it could in a business context.

The schematic proposed in Diagram 9.1 below summarise the discussion above. It should be read starting from the centre and working outwards.

Diagram 9.1: The Actuarial Practice and Control Schematic



Some further comments on this Actuarial Practice and Control Schematic are:

- **APC Focus:** The primary focus of APC lies in the use of the models (the use of the tools discussed previously) and the Analytic and Professional cycles. However, this is then set in a framework of the full Actuarial Schematic.
- **Not Discipline-Specific:** It is noted that the Schematic is not discipline-specific to specific actuarial disciplines. In fact, it could be applied in many different contexts on rewriting the specific areas of application in terms of the particular focus of these contexts. That is, the 'Financial Control' and Financial Services' sets of topics would be amended.
- **'Apply the Control Cycle to ...':** This is a question which APC students should not only expect but proactively seek to apply to problems and situations. In providing a solution in the context of APC it would be expected that the Analytic and Professional cycles in particular are interpreted in the application to the particular situation;

- ***Inward / Outward Orientation:*** The choice of the colour scheme of setting Models in a red background, the Financial Control topics in an amber background, and Financial Services topics in a green background is deliberate. It is seeking to flag that an inward ‘techie’ approach is potentially unhealthy for the future of the profession and that the education of actuaries needs to focus on being holistic and outward looking.
- ***Overall Context relative to Actuarial Education:*** It is noted that an arrow starting at the centre of the Actuarial Practice and Control Schematic and moving outwards could be interpreted as identifying a movement from initial actuarial education through to senior actuarial education leading to full qualification or Fellowship and then ongoing continuing actuarial education. In the Australian context this process can be summarised as:
 - Part I
 - Part II and APC
 - Part III
 - CPD

The increasing role of developing actuarial capabilities, separate and in addition to the necessary actuarial technical skills, is then clear.

It is therefore suggested that the Actuarial Schematic has application at a broader level than specifically in the context of APC and as part of the initial actuarial education process.

- ***Intellectual Exchange:*** This item is specifically included to emphasise that the development of actuarial theory is a two-way process, depending not only on the profession (internal growth) but also recognising work and developments in other areas of intellectual endeavour (external growth).

10 Conclusion

The primary objective of this paper has been to articulate a philosophy to provide direction to APC. This is initially given in an APC Mission Statement and then expanded on in the commentary.

We then discuss actuarial capabilities and their importance. This leads to the development of a framework which develops a nested structure which is relevant to both actuarial practice and actuarial education. A control cycle is part of this structure, and specifically comes in at two levels – the Analytic Cycle and the Professional Cycle.

We can summarise the Actuarial Control Cycle by noting the specific points which should be addressed in resolving a question of 'Apply the Actuarial Control Cycle to ...'

To 'Apply the Actuarial Control Cycle to ...'

What problem is to be modelled in the Financial Control environment?

Apply the Analytic Cycle:

Specify

Solve

Monitor

Apply the Professional Cycle:

Environment

Professionalism

Risk

Implementation

Understand the cyclic nature of the ongoing management of the issue

Overall we can make the following summary interlinking the Actuarial Control Cycle with Actuarial Control and Actuarial Practice:

Actuarial Practice and Control:

Models

+ Analytic Cycle

+ Professional Cycle

= Actuarial Control Cycle

+ Application to Financial Services

= Actuarial Control

+ Actuarial Capabilities

= Actuarial Practice

The Actuarial Practice and Control schematic 9.1 provides a powerful realisation of the control cycle concept in an actuarial environment and recognises that there is much more to successfully resolving a problem than simply carrying out the computations. A full suite of actuarial capabilities needs to be in place to ensure proper and complete actuarial practice is carried out.

The structure proposed in this paper, encompassing a description of a tool which can be called an Actuarial Control Cycle, is more general and provides a basis from which this tool can be used to become part of Actuarial Practice and Control. This has application not only from an educational perspective, but also from the professional management perspective.

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