



SINGAPORE
ACTUARIAL
SOCIETY

SAP X01

STANDARD OF ACTUARIAL PRACTICE

Effective from 1 April 2024

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Part 1: General

Article 1: Objective

The Standard of Actuarial Practice (SAP) is a Tier-2 Governance Document as defined in the Constitution. Issuance of the SAP is in line with the Singapore Actuarial Society's ("the Society") objective to set and uphold high professional standards amongst members as stipulated in the Constitution.

This SAP provides guidance to Members when performing Actuarial Services to give Intended Users confidence that

- Actuarial Services are carried out professionally and with due care;
- The results are relevant to their needs, are presented clearly and understandably, and are complete; and
- The assumptions and methodology (including, but not limited to, Models and modelling techniques) used are disclosed appropriately.

Where there is doubt as to how provisions in this Standard should apply to specific situations, Members are advised to seek the guidance of a Council member.

This SAP is substantially consistent with the "International Standard of Actuarial Practice 1" issued by the International Actuarial Association in 2019.

Article 2: Scope

This SAP X01 is a general standard. The standard applies to Members of the Society wherever they operate. If the Member is operating outside of Singapore, the Member should comply with local Actuarial Standards if they exist. It applies to all Actuarial Services performed by a Member unless an element of guidance is explicitly superseded by another standard such as a practice-specific SAP that the Society may issue from time to time, or by Law.

Usually, the intent of a practice-specific SAP is to narrow the range of practice considered acceptable under the general standards. In exceptional cases, however, the intent of a practice-specific SAP is to define as acceptable a practice which would not be acceptable under the general standards, in which case that intent is specifically noted by words in a practice-specific SAP like: "Notwithstanding the general standards, the Member should . . .", followed by a description of the exception.

Article 3: Compliance

There are situations where a Member may deviate from the guidance of this SAP but still comply with the SAP:

- Law may impose obligations upon a Member. Compliance with requirements of Law that conflict with this SAP is not a deviation from the SAP.
- The Standard of Professional Conduct (“SPC”) applicable to the Work may conflict with this SAP. Compliance with requirements of the SPC that conflict with this SAP is not a deviation from the SAP.
- The Member may depart from the guidance in this SAP while still complying with the SAP if the Member provides, in the Report, an appropriate statement with respect to the nature, rationale, and effect of any such departure.

Article 4: Applicability

This SAP applies to Members when performing Actuarial Services. A Member who is performing these Actuarial Services may be acting in one of several capacities such as an employee, management, director, external adviser, auditor, or supervisory authority of the entity.

The application of this SAP is clear when a Member who is a single consulting Member is performing Actuarial Services for a client who is not affiliated with the Member.

When a team is performing Actuarial Services, most paragraphs of this SAP apply to every Member on the team. However, requirements in some paragraphs need not be met by every Member on the team personally (e.g. seeking confirmation with the Principal set out in Section 2, Article 1). In the case of such paragraphs, each Member on the team should identify, if relevant to that Member’s work, who on the team is responsible for complying with such requirements and be satisfied that the other person on the team accepts that responsibility.

When a team is performing Actuarial Services, the team leader takes overall responsibility for the team’s work product. A Member who is not the team leader (and hence does not control the team’s work product) should treat the team leader as the user and interpret the ISAP within that context.

If a Member is performing Actuarial Services for an affiliated party, the Member should interpret this SAP in the context of practices that apply normally within or in relation to the affiliated party, except that, if there are substantive inconsistencies between these practices and this SAP, the Member must endeavour to observe the spirit and intent of this SAP as fully as possible.

- The Member should consider the expectations of the Principal. These expectations might suggest that it may be appropriate to omit some of the otherwise required content in the Report. However, limiting the content of a Report may not be appropriate if that Report or the findings in that Report may receive broad distribution.
- If the Member believes circumstances are such that including certain content in the Report is not necessary or appropriate, the Member should be prepared (if challenged by a professional actuarial body with jurisdiction over the Actuarial Services) to describe these circumstances and provide the rationale for limiting the content of the Report.

Article 5: Reasonable Judgment

The Member must exercise reasonable judgment in applying this SAP.

A judgment is reasonable if it takes into account:

- The spirit and intent of the SAPs;
- The type of assignment; and
- Appropriate constraints on time and resources.

Nothing in the SAP should be interpreted as requiring work to be performed that is not proportionate to the scope of the decision or the assignment to which it relates and the benefit that Intended Users would be expected to obtain from the work.

Any judgment required by the SAP (including implicit judgment) is intended to be the Member's Professional Judgment unless otherwise stated.

Article 6: Language

Some of the language used in all SAPs is intended to be interpreted in a very specific way in the context of a decision of the Member. In particular, the following verbs are to be understood to convey the actions or reactions indicated:

- "Must" means that the indicated action is mandatory and failure to follow the indicated action will constitute a departure from this SAP.
- "Should" means that, under normal circumstances, the Member is expected to follow the indicated action, unless to do so would produce a result that would be inappropriate or would potentially mislead the Intended Users of the Actuarial Services. If the indicated action is not followed, the Member must disclose that fact and provide the reason for not following the indicated action.
- "May" means that the indicated action is not required, nor even necessarily expected, but in certain circumstances is an appropriate activity, possibly among other alternatives. Note that "might" is not used as a synonym for "may", but rather with its normal meaning.
- "Any" means all such items if they exist, while acknowledging they may not exist. Such a reference does not give rise to a requirement to create such an item.

This document uses various expressions whose specific meaning is defined in the Glossary. These terms are capitalised in this SAP when used. (e.g. references to Actuaries).

Article 7: Cross-References

When this SAP refers to the content of another document, the reference relates to the referenced document as it is effective on the adoption date as shown on the cover page of this SAP.

The referenced document may be amended, restated, revoked, or replaced after the adoption date. In such a case, the Member must consider the extent the modification is applicable and appropriate to the guidance in this SAP.

Article 8: Effective Date

This SAP is effective for Actuarial Services performed on or after 1 April 2024.

Part 2: Appropriate Practices

Article 9: Acceptance of Assignment

When providing Actuarial Services, the Member should confirm with the Principal the nature and scope of Actuarial Services to be provided, including:

- The role of the Principal;
- Any limitations or constraints on the Member;
- Any requirements that the Member is required to satisfy;
- Identification of the schedule and expected cost or resources needed (especially if they are substantial); and
- The information needed to be communicated to and by the Member, especially if it is sensitive or confidential.

In accepting an assignment for Actuarial Services, the Member shall:

- Be competent and appropriately experienced to perform the services;
- Be satisfied that the assignment can be performed under the SPC; and
- Have reasonable assurance of time, resources, access to relevant employees and other relevant parties, access to documentation and information, and the right of the Member to communicate information, as may be necessary for the Work.

Article 10: Knowledge of Relevant Circumstances

The Member should have or obtain sufficient knowledge and understanding of the Data and information available, including the relevant history, processes, nature of the business operations, Law, and business environment of the entity, to be appropriately prepared to perform the Actuarial Services required by the assignment.

Article 11: Reliance on Others

The Member may use information prepared by another party such as Data, relevant contracts, insurance contract or pension plan provisions, opinions of other professionals, projections, and supporting analyses (but excluding assumptions or methodology). The Member may select the party and information on which to rely, or may be given the information by the Principal. The Member may take responsibility for such information, or the Member may state that reliance has been placed upon the source of this information and disclaim responsibility.

If the Member selects the party on whom to rely, the Member should consider the following:

- The other party's qualifications;
- The other party's competence, integrity, and objectivity;
- The other party's awareness of how the information is expected to be used;
- Discussions and correspondence between the Member and the other party regarding any facts known to the Member that are likely to have a material effect upon the information used; and
- The need to review the other party's supporting documentation.

If the Member uses information prepared by another party without disclaiming responsibility for that information, the Member:

- Should determine that the use of that information conforms to accepted actuarial practice in the jurisdiction(s) of the Member's services;
- Should establish appropriate procedures for the management and review of the information that the Member intends to use; and
- Does not need to disclose the source of the information.

If the Member states reliance on the information prepared by another party and disclaims responsibility for it, the Member should:

- Disclose that fact (including identifying the other party) in any Report or other appropriate communication;
- Disclose the nature and extent of such reliance;
- Examine the information for evident shortcomings;
- When practicable, review the information for reasonableness and consistency; and
- Report the steps, if any, that the Member took to determine whether it was appropriate to rely on the information.

If the information was prepared by the other party under a different jurisdiction, the Member should consider any differences in the Law or Accepted Actuarial Practice between Singapore and the other jurisdictions and how that might affect the Member's use of the information.

Article 12: Materiality

In case of omissions, understatements, or overstatements, the Member should assess whether or not the effect is material. If the effect of any of these is material, the Member should disclose this in any Report to which it is relevant. The threshold of materiality under which the work is being conducted should be determined by the Member unless it is imposed by another party such as an auditor or the Principal. When determining the threshold of materiality, the Member should:

- Assess materiality from the point of view of the Intended User(s), recognizing the purpose of the Actuarial Services; thus, an omission, understatement, or overstatement is material if the Member expects it to affect significantly either the Intended User's decision-making or the Intended User's reasonable expectations;
- Consider the Actuarial Services and the entity that is the subject of those Actuarial Services; and
- Consult with the Principal if necessary.

Article 13: Data Quality

The Member should consider whether sufficient and reliable Data are available to perform the Actuarial Services. Data are sufficient if they include the appropriate information for the work. Data are reliable if that information is materially accurate.

The Member should take reasonable steps to review the consistency, completeness, and accuracy of the Data used. These might include:

- Undertaking reconciliations against audited financial statements, trial balances, or other relevant records, if these are available;
- Testing the Data for reasonableness against external or independent Data;
- Testing the Data for internal consistency; and
- Comparing the Data to that for a prior period or periods.

The Member should describe this review in the Report.

To the extent possible and appropriate when setting entity-specific assumptions, the Member should consider using Data specific to the entity for which the assumptions are being made. Where such Data are not available, relevant, or credible, the Member should consider industry Data, Data from other comparable sources, population Data, or other published Data, adjusted as appropriate. The Data used, and the adjustments made, should be described in the Report.

The Member should disclose any modification of Data before its use (such as interpolation, extrapolation, adjustment, or discarding of outliers) in any Report.

The Member should consider the possible effect of any Data deficiencies (such as inadequacy, inconsistency, incompleteness, inaccuracy, and unreasonableness) on the results of the Work. If such deficiencies in the Data are not likely to materially affect the results, then the deficiencies need not be considered further. If the Member cannot find a satisfactory way to resolve the deficiencies, then the Member should consider whether to:

- Decline to undertake or continue to perform the Actuarial Services;
- Work with the Principal to modify the Actuarial Services or obtain appropriate additional Data; or
- Subject to compliance with the SPC, perform the Actuarial Services as well as possible and disclose the Data deficiencies in the Report (including an indication of the potential impact of those Data deficiencies).

Article 14: Assumptions and Methodology

The assumptions and methodology may be

- Set by the Member (Refer to Article 7);
- Prescribed by the Principal or another party (Refer to Article 8); or
- Mandated by Law (Refer to Article 9).

Where the Report is silent about who set an assumption or methodology, the Member who authored the Report will be assumed to have taken responsibility for such assumption or methodology.

Article 15: Assumptions and Methodology Set by Member

Where the Member sets the assumptions and methodology, or the Principal or another party sets an assumption or methodology that the Member is willing to support:

- Selection of Assumptions and Methodology - The Member should select the assumptions and methodology that are appropriate for the work. The Member should consider the needs of the Intended Users and the purpose of the Actuarial Services. In selecting assumptions and methodology, the Member should consider the circumstances of the entity and the assignment, as well as relevant industry and professional practices. The Member should consider to what extent it is appropriate to adjust assumptions or methodology to compensate for known deficiencies in the available Data.
- Appropriateness of Assumptions - The Member should consider the appropriateness of the assumptions underlying each component of the methodology used. Assumptions generally involve significant Professional Judgment as to the appropriateness of the methodology used and the parameters underlying the application of such methodology. Assumptions may (if permitted in the circumstances) be implicit or explicit and may involve interpreting past Data or projecting future trends.
- Margins for Adverse Deviations - In cases where unbiased calculations are not required, the Member should consider to what extent it is appropriate to adjust the assumptions or methodology with margins for adverse deviations in order to allow for uncertainty in the underlying Data, assumptions, or methodology. The Member should disclose any incorporation of margins for adverse deviations in assumptions or methodology.
- Discontinuities - The Member should consider the effect of any discontinuities in experience on assumptions or methodology. Discontinuities could result from:
 - Internal circumstances regarding the entity such as changes in an insurer's claims processing, changes in the mix of business, spike in surrenders due to bonus cut or

design of surrender penalty schedule, and changes in non-guaranteed premium rates;
or

- External circumstances impacting the entity such as changes in the legal, economic, legislative, regulatory, supervisory, demographic, technological, and social environments.
- Individual Assumptions and Aggregate Assumptions – The Member should assess whether an assumption set is reasonable in the aggregate. While assumptions might be justifiable individually, it is possible that prudence or optimism in multiple assumptions will result in an aggregate assumption set that is no longer valid. If not valid, the Member should make appropriate adjustments to achieve a reasonable assumption set and final result.
- Internal Consistency of Assumptions – The Member should determine if the assumptions used for different components of the Work are materially consistent, and that any significant interdependencies are modelled appropriately. The Member should disclose any material inconsistency in the Report.
- Alternative Assumptions and Sensitivity Testing – The Member should consider and address the sensitivity of the methodology to the effect of variations in key assumptions, both individually and concurrently, when appropriate. In determining whether sensitivity has been appropriately addressed, the Member should take into account the purpose of the Actuarial Services and whether the results of the sensitivity tests reflect a reasonable range of variation in the key assumptions, consistent with that purpose.

Article 16: Assumptions and Methodology Prescribed by the Principal or another party (other than by Law)

If the Member is willing to support the prescribed assumption or methodology (following Section 2 Article 7 as applicable), the Member may disclose the party who prescribed the assumption or methodology and the Member's support.

If the Member is unwilling to support the prescribed assumption or methodology because:

- It significantly conflicts with what would be appropriate for the purpose of the Actuarial Services, the Member should disclose in the Report that fact, the party who prescribed the assumption or methodology, and the reason why this party, rather than the Member, set the assumption or methodology; or
- The Member has been unable to judge the appropriateness of the prescribed assumption or methodology without performing a substantial amount of additional work beyond the scope of the assignment, or the Member was not qualified to judge the appropriateness of the assumption,

then the Member should disclose in the Report that fact, the party who prescribed the assumption or methodology, and the reason why this party, rather than the Member, set the assumption or methodology.

When the Principal requests an additional calculation using an assumption set which the Member does not judge to be reasonable for the purpose of the Actuarial Services, the Member may provide the Principal with the results based on such assumptions. If those results are communicated to any party other than the Principal, the Member must disclose the source of those assumptions and the Member's opinion of their appropriateness.

Article 17: Assumptions and Methodology Mandated by Law

When an assumption or methodology is mandated by Law, the Member should disclose in the Report that the assumption or methodology was mandated by Law and whether such assumption or methodology may limit the relevance of the work for other purposes.

Article 18: Model Governance

(For the purpose of this Article, "using" includes selecting, developing, modifying, and running Models.)

This Article applies to all Models used when performing Actuarial Services which support decision making. It provides guidance to Actuaries on appropriate Model Governance to manage the risks inherent in using a Model. Model Governance is important for all Models, from those using simple spreadsheets to those including complex simulations. The level of governance should be proportionate to the risk to the Intended Users as a result of an incorrect conclusion being drawn from the results of the Model.

The Member involved in using Models should:

- Be satisfied that the Model Risks have been identified, assessed, and that there are appropriate actions to mitigate these risks such as adequate model validation, documentation, and process controls.
- Be satisfied that an appropriate model validation has taken place. The model validation includes assessments that:
 - The Model reasonably fits its intended purpose. Items that the Member should consider, if applicable, include the availability, granularity, and quality of Data and inputs required by the Models, the appropriateness of the relationships recognized, and the Model's ability to generate an appropriate range of results around expected values;
 - The Model meets its specifications; and
 - The full or partial results of the Model can be reproduced or any differences can be explained.

The model validation should be performed by individual(s) who did not develop the Model, unless to do so imposes a burden that is disproportionate to the Model Risk.

- Understand the Model, the conditions under which it is appropriate for the Model to be used including any limitations of the Model for the intended use, the context in which the Model will be used, how model inputs will be provided, and how the Member expects the

results of the Model will be used. The Member should disclose relevant limitations or uncertainties and their broad implications in any Report.

- Be satisfied that there is adequate documentation of the Model design, construction, and operation and of the conditions under which it is appropriate to use the Model, including any limitations of the Model. This documentation should include, where appropriate, scope, purpose, methodology, statistical quality, calibration, and fitness for intended purpose, and reflect changes to the Model (if any) made by the Member.
- Be satisfied that the Model is subject to appropriate controls. This should typically include a change control process that:
 - Avoids unauthorized changes to the Model;
 - Documents any changes made and any material impact on the Model; and
 - Allows any changes to be reversed.
- When the results or output of a Model run are to be used:
 - Be satisfied that the conditions to use the Model are met;
 - Be satisfied that there are appropriate controls on inputs and outputs of the Model;
 - Consider whether the model validation described in this Article should be performed in whole or in part;
 - Understand, and where appropriate explain, material differences between different runs of the Model, and be satisfied that there is an adequate control process for production runs. In the case of stochastic Models, be satisfied that a sufficient number of runs of the Model are made and understand the significant differences between different runs of the Model;
 - Understand any management actions or responses assumed within the Model. The Member should disclose such management actions or responses assumed and their broad implications in any Report; and
 - Document, where appropriate, limitations, inputs, key assumptions, intended uses, and model output.

Article 19: Process Management

The Member should consider to what extent, if any, the procedures used to carry out the Work should be controlled, and if so, how.

The Member should review the results produced by the selected assumptions and methodology for overall reasonableness.

Article 20: Peer Review

The Member should consider to what extent, if at all, it is appropriate for the Report to be independently reviewed, in totality or by component, before the final Report is delivered to the Principal or distributed to the Intended Users. The purpose of peer review is to ensure the quality of the Report, with the process tailored to the complexity of the Work and the specific environment in which the Member works. If a peer review is deemed to be appropriate:

- The Member should select a reviewer who is independent of involvement with the specific component(s) reviewed and is knowledgeable and experienced in the practice area of the Actuarial Services.
- If the reviewer is a Member, the reviewer should comply with the guidance of this SAP, as applicable, in performing the review.

Article 21: Treatment of Subsequent Events

The Member should consider any Subsequent Event that has the potential of materially changing the results of the Actuarial Services if the event had been reflected in the Work and disclose such an event in the Member's communication.

Article 22: Retention of Documentation

The Member should retain, for a reasonable period of time, sufficient documentation (including internal working papers) for purposes such as:

- Peer review, regulatory review, and audit;
- Compliance with Law; and
- Assumption of any recurring assignment by another Member.

Documentation is sufficient when it contains enough detail for another Member qualified in the same practice area to understand the Work and assess the judgments made.

Nothing in this SAP is intended to give any person access to material beyond the access that they are already authorized to have.

Part 3: Communication

Article 23: General Principles

Any Communication should be appropriate to the particular circumstances and take the skills, understanding, levels of relevant technical expertise, and needs of the Intended User into consideration to allow the Intended User to understand the implications of the Member's Communication.

- Form and Content - The Member should determine the form, structure, style, level of detail, and content of each Communication to be appropriate to the particular circumstances, taking into account the Intended Users.
- Clarity - The Member should word each Communication to be clear and use language appropriate to the particular circumstances, taking into account the Intended Users.
- Timing of Communication - The Member should issue each Communication within a reasonable time period. The timing of the Communication should reflect any arrangements that have been made with the Principal. The Member should consider the needs of the Intended Users in setting the timing.
- Identification of the Member - A Communication shall clearly identify the issuing Member. When two or more individuals jointly issue a Communication, at least some of which is actuarial in nature, the Communication shall identify all responsible Actuaries, unless the Actuaries judge it inappropriate to do so. The name of an organization with which each Member is affiliated also may be included in the Communication, but the Member's responsibilities are not affected by such identification. Unless the Member judges it inappropriate, any Communication shall also indicate to what extent and how supplementary information and explanation can be obtained from the Member or another party.

Article 24: Report

The Member should complete a Report unless any Intended Users will otherwise be adequately informed about the results of Actuarial Services (including access to the supporting information which is necessary to understand these results). The Member should present all

information with sufficient detail that another Member qualified in the same practice area could make an objective appraisal of the reasonableness of the Member's Work.

- Content - In the Report, the Member should include, if applicable:
 - The scope and intended use of the Report;
 - The results of Actuarial Services, including the potential variability of these results;
 - The methodology, assumptions, and Data used;
 - Any restrictions on distribution;
 - The date of the Report; and
 - Information on the authorship of the Report.
- Disclosures - In the Report, the Member issuing the Report should disclose, if applicable:

- Any material deviation from the guidance in this SAP (per Section 1 Article 3);
 - Any reliance on information prepared by another party for which the Member disclaims responsibility (per Section 2 Article 3);
 - Any material omissions, understatements, or overstatements (per Section 2 Article 4);
 - Any Data modification, validation and deficiencies (per Section 2 Articles 2 to 5);
 - Any margins for adverse deviations in assumptions or methodology (per Section 2 Article 7);
 - Any material inconsistency in the assumptions used (per Section 2 Article 7);
 - Assumptions and methodology that have been prescribed by another party which the Member does not judge to be reasonable (per Section 2 Article 8);
 - Assumptions and methodology that are mandated by Law (per Section 2 Article 9);
 - The limitations, and uncertainties, of any Model used for the Work, and their broad implications (per Section 2 Article 10);
 - The management actions or responses assumed in any Model used for the Work, and their implications (per Section 2 Article 10); and
 - Any material subsequent event (per Section 2 Article 13).
- Authorship - The Member issuing the Report should include in the Report:
 - The Member's name;
 - If applicable, the name of the organization on whose behalf the Member is issuing the Report, and the Member's position held;
 - The capacity in which the Member serves;
 - The Member's qualifications;
 - The code of professional conduct and actuarial standards under which the Work was performed, if there is any possible ambiguity; and
 - If applicable, attestations and reliances.
 - Form - A Report may comprise one or several Communications that may exist in several different formats. Where a Report comprises multiple Communications, the Member should communicate to each Intended Users which Communications compose the Report. The Member should ensure that Report components (especially those in electronic media) are such that they can be reliably reproduced for a reasonable period of time.
 - Constraints - The content of a Report may be constrained by circumstances such as legal, legislative, regulatory, or supervisory proceedings. Constraints could also include other standards such as financial Reporting standards or an entity's accounting policy. The Member should follow the guidance of this SAP to the extent reasonably possible within such constraints.

Version Control

Version Number	Effective Date	Remarks
1.0	1 January 2018	Initial version. Based on IAA ISAP1.
1.1	1 April 2024	Updated in accordance with IAA ISAP1. Adopted at AGM held on Mar 2024.