



ASOP 46: Risk valuation
in Enterprise Risk

ASOP 47: Risk Treatment
in Enterprise Risk
Management

Joint Enterprise Risk Management Seminar
May 2019



Welcome our Livestreaming Audience

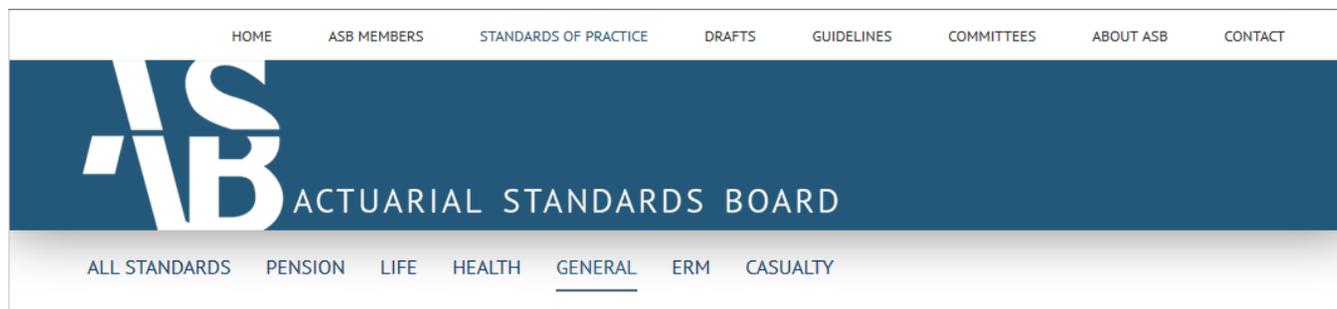
- Please use Microphones when asking questions or making comments
- Livestream folks – don't forget to ask questions, we will try to answer them
- Everyone should be able to test your knowledge of the ASOP's with our Kahoot game
- While all are welcome to join, this session will focus primarily on US Actuarial Standards of Practice



Professional Guidance

Where to start?

- The ASB website



- Applicability guidelines
 - Non-binding, like practice notes
 - It is each actuary's responsibility to determine which ASOPs apply to the work at hand



Applicability Guidelines

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	 <p>Applicability Guidelines for Actuarial Standards of Practice – Casualty</p> <p>AMERICAN ACADEMY of ACTUARIES <i>Objective. Independent. Effective.™</i></p>				<p>Please note that the following ASOPs apply to all assignments in all practice areas:</p> <p>1. Introductory Actuarial Standard of Practice</p> <p>23. Data Quality</p> <p>41. Actuarial Communications</p> <p>© 2018 American Academy of Actuaries. Last updated September 2018.</p>																
2																					
3																					
4																					
5																					
6	Description of Assignment				Actuarial Standard of Practice (ASOP)																
7					7	12	13	17	19	20	21	25	29	30	36	38	39	43	46	47	53
8	1.0 Appraisals																				
9	1.1	Appraisals			7	12			19	20	21	25				38		43			53
10	2.0 Data Management																				
11	2.1	Data management														38					
12					Note that any standards related to the purpose for which the actuary is managing data would also apply.																
13	3.0 Enterprise Risk Management																				
14	3.1	Enterprise risk management			7	12	13			20		25				38		43	46	47	53
15	3.2	Model development and/or validation, including catastrophe models			7					20	21					38		43	46	47	53
16	3.3	Stress testing			7	12				20						38		43	46	47	
17	3.4	ORSA			7	12	13			20		25				38		43	46	47	53
18	4.0 Expert Advice, Witness, and/or Testimony																				
19	4.1	Expert testimony							17												
20					Note that any standards relating to the subject on which the actuary is providing expert advice would also apply.																
21	5.0 Financial Analysis, Projections, and Reporting																				
22	5.1	Analysis of cost of capital issues			7					20					30	38					53
23	5.2	Asset liability management			7					20		25				38		43			
24	5.3	Profitability analysis			7	12	13			20					30	38		43			53
25	6.0 Product Development/Ratemaking/Pricing																				
26	6.1	Creation and review of risk classification plan				12	13					25				38	39				53
27	6.2	Evaluation of deductibles, coinsurance, and insurance to value				12	13					25	29			38					53
28	6.3	Estimation of risk provision			7	12	13			20		25	29	30	38	39					53
29	6.4	Individual risk rating			7	12	13					25	29	30	38	39					53
30	6.5	Relativity analysis and filings (e.g., increased limits factors, amount of insurance relativities, territorial relativities, etc.)				12	13					25	29			38	39				53

Keeping up: ASB's Boxscore

SUBJECT AREA	2018 QUARTER				COMMENTS
	1	2	3	4	
CASUALTY COMMITTEE					
Rate Filings ASOP				PD	The ASB approved a task force in November 2018 to draft an ASOP on rate filings. The task force is planning/discussing next steps.
ENTERPRISE RISK MANAGEMENT COMMITTEE					
 Capital Adequacy Assessment	R	R	R	R	The ASB approved a third exposure draft in November 2018, with a comment deadline of March 1, 2019. The committee is making revisions and the ASB plans to review a proposed final ASOP at its June 2019 meeting.
GENERAL COMMITTEE					
ASOP No. 17 <i>Expert Testimony by Actuaries</i>	R	F	F	F	The ASB adopted a final revision of ASOP No. 17 at its June 2018 meeting. The effective date is Dec. 1, 2018.
ASOP No. 32 <i>Social Insurance</i>	D	R	E	R	The ASB approved an exposure draft in October 2018, with a comment deadline of Feb. 1, 2019. The task force is making revisions and the ASB plans to review a proposed final ASOP at its September 2019 meeting.
ASOP No. 38 <i>Catastrophe Modeling (for All Practice Areas)</i>	F	F	F	F	The ASB adopted a final revision at its March 2014 meeting subject to ASB approval of changes necessitated by the final version of the proposed new modeling ASOP.
 Modeling	R	R	R	FE	The ASB approved a fourth exposure draft at its December 2018 meeting. The comment deadline is May 15, 2019.
 Setting Assumptions	R	R	R	SE	The ASB approved a second exposure draft at its March 2019 meeting. The comment deadline of July 31, 2019.

ASOP 46 & 47: Background

- Task Force created in 2009 to visit the need for ERM standards
- ASOP 46 Risk Evaluation in Enterprise Risk Management adopted September 2012, effective May 1, 2013
- ASOP 47 Risk Treatment in Enterprise Risk Management adopted December 2012, effective May 1, 2013
- The two standards cover Risk Evaluation and Risk Management exclusively, not intended to be all encompassing



ASOP 46 vs. ASOP 47

- Purpose of ASOP 46
“ ...risk evaluation systems, including designing, developing, implementing, using, maintaining, and reviewing those systems”
- Risk evaluation is one part of the ERM control cycle
- Does not apply to risk evaluation outside of an ERM setting

- Purpose of ASOP 47
“ ...risk treatment within a risk management system, including designing, implementing, using, maintaining, and reviewing those systems”
- Risk treatment is often performed as part of an ERM control cycle
- Does not apply to risk treatment outside of an ERM setting



Kahoot!

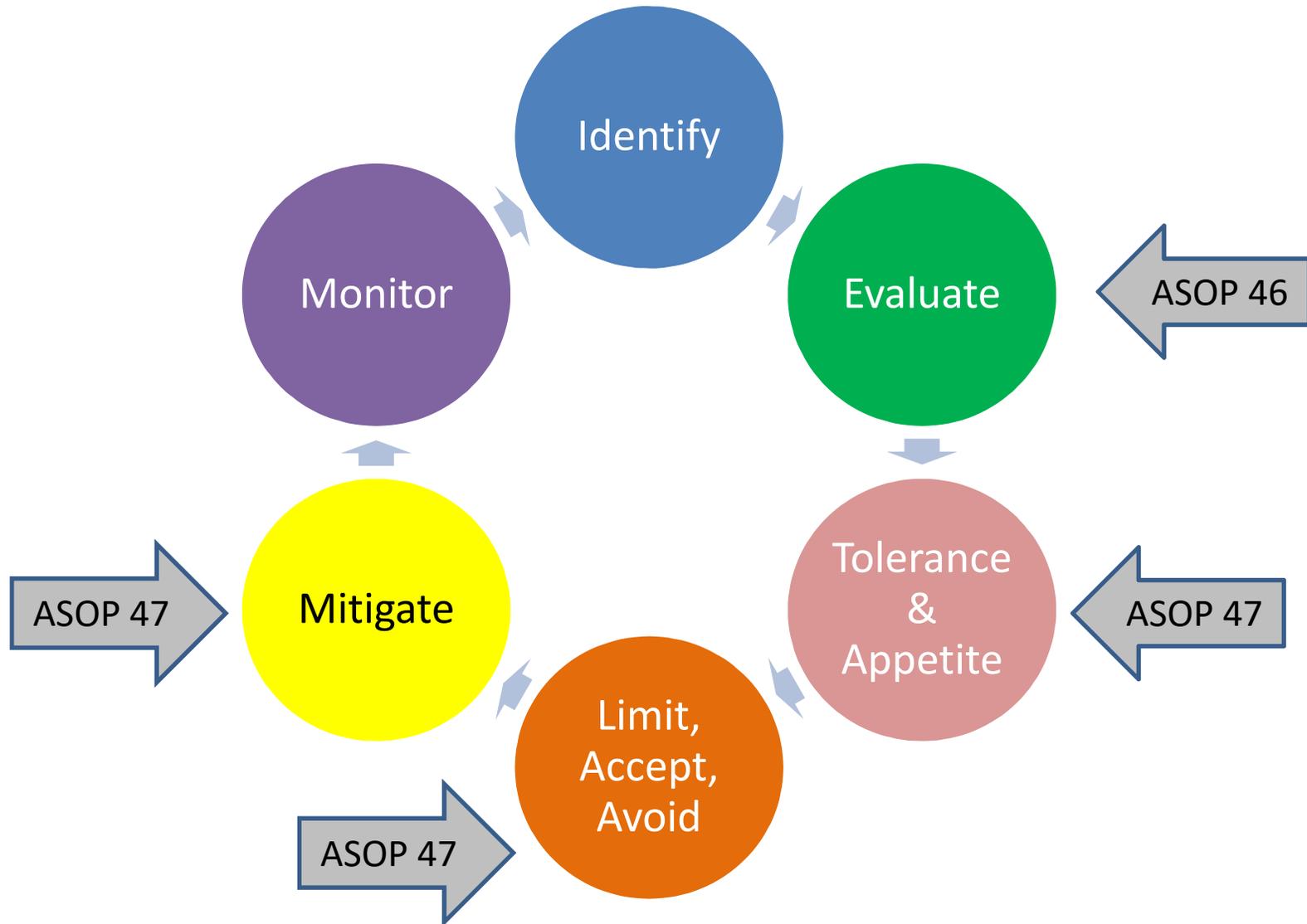
Instructions:

- On your phone or tablet, go to

kahoot.it

- Enter the game pin - **787746**
- Enter your nickname

Enterprise Risk Cycle



Professional Guidance: ASOP 46

1.1 Purpose

This actuarial standard of practice (ASOP) provides guidance to actuaries when performing professional services with respect to risk evaluation systems, including designing, developing, implementing, using, maintaining, and reviewing those systems.

1.2 Scope

This standard focuses on five aspects of risk evaluation: risk evaluation models, economic capital, stress testing, emerging risks, and other risk evaluations.

If the actuary departs from the guidance set forth in this standard in order to comply with applicable law (statutes, regulations, and other legally binding authority), or for any other reason the actuary deems appropriate, the actuary should refer to section 4.



Professional Guidance: ASOP 46

2 Definitions

1. Economic Capital
2. Emerging Risk
3. Enterprise Risk Management
4. ERM Control Cycle
5. Organization
6. Risk
7. Risk Appetite
8. Risk Evaluation System
9. Risk Limit
10. Risk Management System
11. Risk Metric
12. Risk Mitigation
13. Risk Profile
14. Risk Tolerance
15. Scenario Test
16. Stress test



Professional Guidance: ASOP 46

3.1 Risk Evaluation

In performing services related to risk evaluation, the actuary should consider, or may rely on others who have considered, the following:

- a. information about the financial strength, risk profile, and risk environment of the organization that is appropriate to the assignment – (flexibility, nature of risk, current and long term risk, strategic goals, stakeholder interest, regulatory risk criteria, risk interaction, fungibility of capital, risk compared to competitors)
- b. information about the organization’s own risk management system, (tolerance, appetite, ERM control cycle, knowledge and experience of board regarding risk, execution of control cycle)
- c. the relationship between the organization’s financial strength, risk profile, and risk environment as identified in (a) above, and the organization’s risk management system as identified in (b) above;
- d. the intended purpose and uses of the actuarial work product



Professional Guidance: ASOP 46

3.2 Considerations Related to Risk Evaluation Models

In developing, reviewing, or maintaining models used in risk evaluation, the actuary should consider, or may rely on others who have considered, the following:

- a. whether the models are fit for the purpose
 - Reproducible and adoptable, sophistication, usability, reliability, statistical limitations, quality of the data, methodologies for verification, dependencies, cash flow, and discounting
- b. whether the model assumptions are appropriate
 - Assumptions are supportable
 - Assumptions are regularly revisited
 - Assumptions reflect anticipated management actions



Professional Guidance: ASOP 46

3.3 Economic Capital Model

Within ERM programs, actuaries are often called upon for assistance in determining the economic capital of the organization.

3.3.1. Considerations Relating to an Economic Capital Model the actuary should consider the following:

- a. the appropriateness of the selected time frame
- b. the degree to which the economic capital model reflects the significant risks of the organization
- c. the appropriateness of the method used to model each risk



Professional Guidance: ASOP 46

3.3 Economic Capital Model

3.3.2. Accounting Framework: The actuary's references to and reliance on accounting frameworks in an economic capital model

3.3.3. Methods In determining economic capital, the actuary should select a method or combination of methods where the input(s) to the method(s) and the results of the method(s) are consistent with the tasks and considerations

- a. Stress Test
- b. Stochastic Models
- c. References to Standards



Professional Guidance: ASOP 46

3.3 Economic Capital Model

3.3.4. Assumptions The actuary should use professional judgment in the selection of assumptions.... the actuary should consider the following...

- a. Historical data
- b. Prices in marketplace
- c. Opinions of other experts
- d. Distribution fit
- e. Ability to fit extreme values
- f. Sensitivity to assumption changes
- g. Internal consistency of assumptions
- h. Consistency of application assumptions



Professional Guidance: ASOP 46

3.3 Economic Capital Model

3.3.5. ValidationThe actuary should devise appropriate tests of the distribution of outcomes calculated by the model ... and the sensitivity of those distributions to changes in the assumptions and parameters. The actuary should also perform validation tests to determine whether the model results are reasonably consistent



Professional Guidance: ASOP 46

3.4 Stress and Scenario Testing

3.4.1. Considerations Relating to Stress and Scenario Tests

The actuary should consider the following:

- a. Similar or different degrees of adversity
- b. Business plan in extreme events
- c. Single or series of events with catastrophic results
- d. Actions and reactions from stakeholders and markets may differ
- e. Whether assumed interdependencies are appropriate
- f. Non-quantifiable risk and possible financial impacts
- g. Test may be hypothetical, the Actuary does NOT need to validate the degree of realism



Professional Guidance: ASOP 46

3.4 Stress and Scenario Testing

3.4.2. Methods- Approaches that may be used for stress and scenario testing include the following

- a. Models of Single Subsystems of the Organization
- b. Fully Integrated and Automated Forecasting Model

3.4.3. Assumptions- the actuary should form a perspective regarding the ways that the defined stress impacts upon various elements of the organization, including consideration of the following

- a. Effect on other assumptions
- b. Management Response
- c. Regulatory Reactions
- d. Risk Mitigation
- e. Time Element



Professional Guidance: ASOP 46

3.4 Stress and Scenario Testing

3.4.4. Constructing Scenarios-

- a. The actuary should consider whether the scenarios need to be developed with consideration of the many different elements of the broad environment that might change from the baseline simultaneous with the main event under consideration.
- b. In addition, the actuary should consider the other effects upon the organization as described in items (a) through (e) of section 3.4.3

3.4.5 – Disclosure – refer to section 4.1.2



Professional Guidance: ASOP 46

3.5 Emerging Risk -the actuary should consider the following:

- a. the potential impact of emerging risks across various time horizons; and
- b. the potential secondary effects from an organization's assumed actions ...

3.6 Other Risk Evaluations

3.7 Specific Circumstances

3.8 Reliance on information or data from others

3.9 Documentation – refer to Section 4 and ASOP 41



Professional Guidance: ASOP 46

4 Documentation

- Section 4.1 gives guidance on disclosures for Economic Capital Models, Stress Test, Emerging Risk, Changes in Systems, Assumptions, Risk Included, Model Validation
- Section 4.2 requires documentation of deviations from the standard based on ASOP 41 sections 4.2 – 4.4



Kahoot!

Instructions:

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- Enter your nickname

Professional Guidance: ASOP 47

1.1 Purpose

This actuarial standard of practice (ASOP) provides guidance to actuaries when performing professional services with respect to risk treatment within a risk management system, including designing, implementing, using, maintaining, and reviewing those systems.

1.2 Scope

This standard focuses on four aspects of risk treatment: determining risk tolerance, choosing risk appetites, setting risk limits, and performing risk mitigation activities.



Professional Guidance: ASOP 47

2 Definitions

1. Basis Risk
2. Counterparty Risk
3. Enterprise Risk Management
4. ERM Control Cycle
5. Organization
6. Risk
7. Risk Appetite
8. Risk Limit
9. Risk Management System
10. Risk Mitigation
11. Risk Profile
12. Risk Tolerance
13. Risk Treatment



Professional Guidance: ASOP 47

3.1 Risk Treatment

In performing services related to risk treatment, the actuary should consider, or may rely on others who have considered, the following:

- a. information about the financial strength, risk profile, and risk environment of the organization that is appropriate to the assignment
- b. information about the organization's own risk management system;
- c. the relationship between the organization's financial strength, risk profile, and risk environment as identified in (a) above, and the organization's risk management system as identified in (b) above;
- d. the intended purpose and uses of the actuarial work product



Professional Guidance: ASOP 47

3.2 Using models in Risk Treatment

An actuary may use models to provide support for risk treatment decisions, for example, the setting of specific risk tolerance or the selection of a risk mitigation strategy.... Such models are usually risk evaluation models and, as such, the actuary designing or implementing models for risk treatment purposes should refer to ASOP No. 46...



Professional Guidance: ASOP 47

3.3 Organizational Risk Parameters of Risk Tolerance, Risk Appetite, and Risk Limits.

In performing services related to these parameters ...the actuary should consider...the following:

- a. The financial and non-financial benefits associated with each planned, risk-taking activity and the aggregation of those activities
- b. The degree of concentration of the risks of the organization
- c. The opportunities available to mitigate breaches of risk limits and risk tolerance...
- d. Regulatory or accounting constraints...
- e. The relationships between the risk tolerance, risk appetite, and risk limits...
- f. The historical volatility of the organization's results in context of its current risk profile



Professional Guidance: ASOP 47

3.4 Risk Mitigation

In performing services related to risk mitigation, the actuary should consider...the following:

- a. information relating to qualitative aspects of the organization....
 1. Resilience of the organization under duress caused by common fluctuations ..as well as from extreme adverse events
 2. operational capabilities of the organization needed to implement the risk mitigation strategy; and
 3. The potential risk to an organization's reputation as a result of the risk mitigation strategy



Professional Guidance: ASOP 47

3.4 Risk Mitigation

- b. information relating to the cost of, potential effectiveness of, and constraints upon risk mitigation activities...
 1. The availability of risk mitigation instruments
 2. The counterparty credit risk
 3. The nature and degree of the basis risk
 4. The degree of confidence that the risk mitigation process can be maintained and repeated
 5. The availability of data on current and future risk positions
 6. The variability of outcomes after mitigation
 7. The accounting treatment of gross and net positions
 8. regulatory constraints on risk mitigation
 9. the granularity of the modeling needed to capture effect



Professional Guidance: ASOP 47

3.5 Reliance on information or data from others – refer to ASOP 23 and 41

3.6 Documentation – refer to Section 4 and ASOP 41

4 Documentation

- Section 4.1 gives guidance on disclosures for Risk Treatment; Model Limitations; Risk Tolerance, Appetite, and Limits; Risk Mitigation; Changes in Process, and Assumptions
- Section 4.2 requires documentation of deviations from the standard based on ASOP 41 sections 4.2 – 4.4



Thank You

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