

# Skills and Knowledge Inventories (SKI) for Property and Casualty Insurance Area of Practice

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## Skills and Knowledge Inventory – Property and Casualty Insurance

This resource document is to assist members practicing in property and casualty insurance (P&C) in gauging their Skills and Knowledge for P&C insurance. The Skills and Knowledge Inventory (SKI) should not be construed as a definitive and complete description of the all the competencies required for members practicing in this area.

The familiarity or adherence to the document is not a necessary condition to meet the CIA's Continuing Professional Development (CPD) Qualification Standard. This document will not be used by the CIA (specifically, the Committee on Professional Conduct or the Disciplinary Tribunal) as a standard to discipline members.

The letter in each box indicates the level of skills and knowledge of a Member working in a given role. The level may vary from that indicated depending on the specific requirements of any practitioner's role. The letter codes are defined as follows:

**Table I-a**

	Blank Box	No specific requirements identified for that subject.
<b>A</b>	Basic Knowledge and General Awareness	General awareness of the basic facts and also of the broad implications of the subject.
<b>W</b>	Wide Knowledge	Deep understanding of the subject area and its implications, as well as its potential interaction with other subjects.
<b>D</b>	Detailed Knowledge and Experience	Ability to effectively apply the subject in practice, with detailed knowledge of the facts, and ability to adjust the approach based on circumstances, particularly for unusual situations.

**Table I-b**

### Skills and Knowledge Subjects for Various Property and Casualty Practitioner Categories

	A	B	C	D	E	F	G
Skills and Knowledge Subjects	Pricing, Underwriting and Product Development	Reinsurance Pricing and Underwriting	Appointed Actuary	Valuation Actuary	Risk Management	Appraisals of P&C Companies	Economic Capital
<b>Actuarial Resources</b>							
1 Insurance Product Features	<b>D</b>	<b>D</b>	<b>W</b>	<b>W</b>	<b>A</b>	<b>A</b>	<b>A</b>
2 Insurance Acts, Guidelines and Regulation	<b>D</b>	<b>D</b>	<b>D</b>	<b>W</b>	<b>W</b>	<b>A</b>	<b>W</b>

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3	Financial Reporting; Insurance Accounting	A	A	D	W	W	D	D
<b>Actuarial Methods</b>								
4	Ratemaking Techniques and Assumptions	D	D	W	W	W	W	A
5	Predictive Modelling	D	D	W	W	D	W	A
6	Reinsurance Structure	D	D	W	W	W	W	D
7	Individual Risk Rating	D	D			A	A	
8	Profit, Contingency and Risk Loads	D	D	W	W	W	W	W
9	Claim Liabilities	W	W	D	D	W	D	W
10	Premium Liabilities			D	W		D	W
11	Actuarial Present Value			D	D		D	W
12	Dynamic Capital Adequacy Testing			D	A	W	A	W
<b>Financial Environment</b>								
13	Dynamic Financial Analysis			W		D	A	D
14	Asset Liability Management			W	A	W	D	D
15	Asset Valuation			W		A	D	W
16	Financial Risk and Solvency Measurement	A	A	W		W	D	D
17	Financial Markets; Fixed Income Instruments	A	A	W		A	W	W

(Updated August 31, 2016)

**Table II**

**Additional Information Regarding Skills and Knowledge Subjects**

<b>Skills and Knowledge Specifics</b>	
1	<b>Insurance Product Features:</b> Understanding the purpose and structure of various types of insurance and reinsurance contracts
2	<b>Insurance Acts, Guidelines and Regulation:</b> Knowledge of the key components of Canadian tort law including functions, negligence theory, strict liability, products liability, etc. and applicable federal and provincial acts and regulations
3	<b>Financial Reporting; Insurance Accounting:</b> Knowledge of annual returns and federal and provincial Income Tax Acts and understanding of IFRS standards and statutory insurance accounting
4	<b>Ratemaking Techniques and Assumptions:</b> Familiarity with applications, parameters and families of loss distributions; large loss adjustments and catastrophe provisions in ratemaking, loss characteristics (frequency and severity); ruin models; probable maximum loss; general linear models (GLMs); minimum bias procedures and classical linear analysis; multidimensional relativities and credibility techniques
5	<b>Predictive Modeling:</b> Applications, parameters and families of loss distributions; large loss adjustments, catastrophe provision in ratemaking, loss characteristics (frequency and severity); ruin models; probable maximum loss; general linear model (GLMs); minimum bias procedures and classical linear analysis; multidimensional relativities; credibility techniques
6	<b>Reinsurance Structure:</b> Familiarity with the concepts of layers of loss, loss elimination ratios, excess loss and limited loss distributions, increased limit factors and interaction of inflation between layers
7	<b>Individual Risk Rating:</b> Understanding of experience rating, in which prior individual risk experience is used to adjust rates prospectively; and retrospective and loss sensitive rating, in which the insured will pay an amount that depends on the experience after the policy has been written
8	<b>Profit, Contingency and Risk Loads:</b> Profit and contingency provisions; rates of return; composition of surplus; risk load; recognition of investment income
9	<b>Claim Liabilities:</b> Comprehension and application of various reserving methodologies including chain ladder, Bornhuetter-Ferguson, frequency/severity models, ULAE reserving, ALAE reserving and testing of reserve adequacy (both prospective and retrospective)
10	<b>Premium Liabilities:</b> Understanding the purpose and calculation of UEPR and the DPAC adequacy test
11	<b>Actuarial Present Value:</b> Understanding the various aspects of discounting including present value calculations, provisions for adverse deviations and the selection of the discount rate
12	<b>Dynamic Capital Adequacy Testing:</b> Knowledge of CIA DCAT Standards, company operations and financial reporting
13	<b>Dynamic Financial Analysis:</b> Familiarity with the development and applications of DFA models including uses, types of models, identification of risks and measuring results
14	<b>Asset Liability Management:</b> Strategies to manage interest rate and cash flow risks including an understanding of duration and convexity measures and immunization strategies
15	<b>Asset Valuation:</b> Understanding the development and assessment of amortized book values, market values and fair values for various instruments

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16	<b>Financial Risk and Solvency Measurement:</b> Assessing the solvency and financial strength of companies including regulatory capital tests, measures of return (IRR, ROE) and capital allocation
17	<b>Financial Markets; Fixed Income Instruments:</b> Knowledge of the definition and characteristics of the money, fixed income, equity and derivatives markets

**Table III**

**Additional Details Regarding Actuarial Practitioner Categories**

<b>A</b>	<b>Pricing, Underwriting and Product Development:</b> Estimates the costs associated with the transfer of risk for primary insurance products. Monitors experience, credibility, tort reforms and trends.
<b>B</b>	<b>Reinsurance Pricing and Underwriting:</b> Estimates costs associated with the transfer of risk in reinsurance contracts.
<b>C</b>	<b>Appointed Actuary:</b> Investigates the recent and current financial position and condition of a company pursuant to the law.
<b>D</b>	<b>Valuation Actuary:</b> Measures and monitors the policy and claims liabilities of a company as of a specific valuation date.
<b>E</b>	<b>Risk Management:</b> Assesses and monitors hazard, financial, operational and strategic risks of a company.
<b>F</b>	<b>Appraisals of P&amp;C Insurance Companies:</b> Assesses the acquisition value of a P&C company whether for M&A purposes, for internal risk and financial management purposes or for financial assessment by external bodies.
<b>G</b>	<b>Economic Capital:</b> Assesses the solvency and financial strength of a company as of a specific valuation date.

**Table IV**

**Suggested Resources for Skills and Knowledge Subjects**

Members are reminded that they must decide for themselves whether the material presented in the reference list is relevant to his/her own development. In doing so, the member should consider that the list is meant to accommodate practitioners of various experience levels and with widely different development requirements. Since members are required to be familiar with the Standards of Practice (SOP) applicable to the actuarial work they perform, the SOPs are not specifically included in the SKI's Reference List but a link to where they can be found on the CIA website is provided at the end of the Table below.

<b>Resources by Broad Category: Actuarial Resources (R); Actuarial Methods (M)</b>	
All	Casualty Actuarial Society Taxonomy <a href="http://www.casact.org/dare/">http://www.casact.org/dare/</a>
All	Resources from the Faculty and Institute of Actuaries: <a href="http://www.actuaries.org.uk/practice-areas">http://www.actuaries.org.uk/practice-areas</a>
R	Property and Casualty Insurance Compensation Corporation <a href="http://www.pacicc.ca/">http://www.pacicc.ca/</a>
R	Facility Association <a href="http://www.facilityassociation.com/">http://www.facilityassociation.com/</a>
R	<b>Automobile Rate Filing Guidelines:</b> Alberta <a href="http://www.airb.alberta.ca/filing-guidelines/">http://www.airb.alberta.ca/filing-guidelines/</a> New Brunswick <a href="http://www.nbib-canb.org/en/filingPackage.php">http://www.nbib-canb.org/en/filingPackage.php</a> Newfoundland <a href="http://www.pub.nl.ca/insurance.htm">http://www.pub.nl.ca/insurance.htm</a> Nova Scotia <a href="http://www.gov.ns.ca/nsirb/industry.asp">http://www.gov.ns.ca/nsirb/industry.asp</a> Ontario <a href="http://www.fsco.gov.on.ca/en/auto/filing-guidelines/Pages/default.aspx">http://www.fsco.gov.on.ca/en/auto/filing-guidelines/Pages/default.aspx</a> Prince Edward Island <a href="http://www.illac.pe.ca/insurance/">http://www.illac.pe.ca/insurance/</a>

<b>Resources by Broad Category: Actuarial Resources (R); Actuarial Methods (M)</b>	
	<b>Insurance Acts:</b>
	Federal Insurance Company Act <a href="http://laws.justice.gc.ca/en/l-11.8/index.html">http://laws.justice.gc.ca/en/l-11.8/index.html</a>
	Alberta <a href="http://www.finance.alberta.ca/publications/insurance/alberta-insurance-act.html">http://www.finance.alberta.ca/publications/insurance/alberta-insurance-act.html</a>
	British Columbia <a href="http://www.bclaws.ca/civix/document/id/complete/statreg/12037_00">http://www.bclaws.ca/civix/document/id/complete/statreg/12037_00</a>
	Manitoba <a href="http://web2.gov.mb.ca/laws/statutes/ccsm/i040e.php">http://web2.gov.mb.ca/laws/statutes/ccsm/i040e.php</a>
	New Brunswick <a href="https://www.canlii.org/en/nb/laws/stat/rsnb-1973-c-i-12/latest/rsnb-1973-c-i-12.html">https://www.canlii.org/en/nb/laws/stat/rsnb-1973-c-i-12/latest/rsnb-1973-c-i-12.html</a>
	Newfoundland <a href="http://assembly.nl.ca/Legislation/sr/statutes/a22.htm">http://assembly.nl.ca/Legislation/sr/statutes/a22.htm</a>
R	Nova Scotia <a href="http://www.novascotia.ca/finance/en/home/insurance/legislation.aspx">http://www.novascotia.ca/finance/en/home/insurance/legislation.aspx</a>
	Ontario <a href="http://www.ontario.ca/laws/statute/90i08">http://www.ontario.ca/laws/statute/90i08</a>
	Northwest Territories <a href="https://www.canlii.org/en/nt/laws/stat/rsnwt-1988-c-i-4/latest/rsnwt-1988-c-i-4.html">https://www.canlii.org/en/nt/laws/stat/rsnwt-1988-c-i-4/latest/rsnwt-1988-c-i-4.html</a>
	Nunavut <a href="https://www.canlii.org/en/nu/laws/stat/rsnwt-nu-1988-c-i-4/latest/rsnwt-nu-1988-c-i-4.html">https://www.canlii.org/en/nu/laws/stat/rsnwt-nu-1988-c-i-4/latest/rsnwt-nu-1988-c-i-4.html</a>
	Prince Edward Island <a href="http://www.irac.pe.ca/insurance/">http://www.irac.pe.ca/insurance/</a>
	Quebec <a href="https://www.lautorite.qc.ca/en/laws-regulations-conso.html">https://www.lautorite.qc.ca/en/laws-regulations-conso.html</a>
	Saskatchewan <a href="http://www.qp.gov.sk.ca/documents/English/Statutes/Statutes/S26.pdf">http://www.qp.gov.sk.ca/documents/English/Statutes/Statutes/S26.pdf</a>
	Yukon <a href="http://www.gov.yk.ca/legislation/acts/insurance.pdf">http://www.gov.yk.ca/legislation/acts/insurance.pdf</a>
	Insurance Acts, Guidelines and Regulations; Financial Reporting and Insurance Accounting <a href="http://www.osfi-bsif.gc.ca/">http://www.osfi-bsif.gc.ca/</a>
R	Table of OSFI Guidelines <a href="http://www.osfi-bsif.gc.ca/Eng/fi-if/rg-ro/gdn-ort/gl-ld/Pages/default.aspx">http://www.osfi-bsif.gc.ca/Eng/fi-if/rg-ro/gdn-ort/gl-ld/Pages/default.aspx</a>
	Financial Returns and Instructions <a href="http://www.osfi-bsif.gc.ca/Eng/fi-if/rtn-rlv/fr-rf/Pages/default.aspx">http://www.osfi-bsif.gc.ca/Eng/fi-if/rtn-rlv/fr-rf/Pages/default.aspx</a>
	Corporate Returns and Instructions <a href="http://www.osfi-bsif.gc.ca/Eng/fi-if/rtn-rlv/cr-rs/Pages/default.aspx">http://www.osfi-bsif.gc.ca/Eng/fi-if/rtn-rlv/cr-rs/Pages/default.aspx</a>
R	Insurance Bureau of Canada <a href="http://www.abc.ca/">http://www.abc.ca/</a>
M	Revised CIA Educational Note on Discounting and Cash Flow Considerations for P&C Insurers <a href="http://www.cia-ica.ca/docs/default-source/2016/216058e.pdf">http://www.cia-ica.ca/docs/default-source/2016/216058e.pdf</a>
M	CIA Educational Note on Future Income Taxes in the Valuation of Policy Liabilities <a href="http://www.cia-ica.ca/docs/default-source/2005/205048e.pdf">http://www.cia-ica.ca/docs/default-source/2005/205048e.pdf</a>
M	CIA Educational Note on DCAT – Minimum Regulatory Capital Requirement <a href="http://www.cia-ica.ca/docs/default-source/2003/203060e.pdf">http://www.cia-ica.ca/docs/default-source/2003/203060e.pdf</a>
M	CIA Educational Note on Valuation of Policy Liabilities P&C Considerations Regarding Claim Liabilities and Premium Liabilities <a href="http://www.cia-ica.ca/docs/default-source/2003/203051e.pdf">http://www.cia-ica.ca/docs/default-source/2003/203051e.pdf</a>

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<b>Resources by Broad Category: Actuarial Resources (R); Actuarial Methods (M)</b>	
M	CIA Educational Note on Evaluation of the Runoff of Claims Liabilities When the Liabilities are Discounted in Accordance with Accepted Actuarial Practice <a href="http://www.cia-ica.ca/docs/default-source/2011/211064e.pdf">http://www.cia-ica.ca/docs/default-source/2011/211064e.pdf</a>
M	CIA Educational Note on Dynamic Capital Adequacy Testing <a href="http://www.cia-ica.ca/docs/default-source/2013/213077e.pdf">http://www.cia-ica.ca/docs/default-source/2013/213077e.pdf</a>
M	Second Revision –CIA Educational Note on Premium Liabilities <a href="http://www.cia-ica.ca/docs/default-source/2016/216076e.pdf">http://www.cia-ica.ca/docs/default-source/2016/216076e.pdf</a>
M	CIA Revised Educational Note on Subsequent Events <a href="http://www.cia-ica.ca/docs/default-source/2015/215083e.pdf">http://www.cia-ica.ca/docs/default-source/2015/215083e.pdf</a>
M	CIA Educational Note on Margins for Adverse Deviations for Property and Casualty Insurance <a href="http://www.cia-ica.ca/docs/default-source/2009/209138e.pdf">http://www.cia-ica.ca/docs/default-source/2009/209138e.pdf</a>
M	CIA Educational Note on Accounting for Reinsurance Contracts under International Financial Reporting Standards <a href="http://www.cia-ica.ca/docs/default-source/2009/209125e.pdf">http://www.cia-ica.ca/docs/default-source/2009/209125e.pdf</a>
M	CIA report on Materiality <a href="http://www.cia-ica.ca/docs/default-source/2007/207099e.pdf">http://www.cia-ica.ca/docs/default-source/2007/207099e.pdf</a>
M	CIA Educational Note on Current Estimates under International Financial Reporting Standards <a href="http://www.cia-ica.ca/docs/default-source/2009/209058e.pdf">http://www.cia-ica.ca/docs/default-source/2009/209058e.pdf</a>
M	CIA Educational Note on Classification of Contracts under International Financial Reporting Standards <a href="http://www.cia-ica.ca/docs/default-source/2009/209066e.pdf">http://www.cia-ica.ca/docs/default-source/2009/209066e.pdf</a>
R	CIA Research Paper on Considerations on the Quantification of Variability in P&C Insurance Policy Liabilities <a href="http://www.cia-ica.ca/docs/default-source/2012/212094e.pdf">http://www.cia-ica.ca/docs/default-source/2012/212094e.pdf</a>
R	CIA Research Paper on Operational Risk <a href="http://www.cia-ica.ca/docs/default-source/2014/214118e.pdf">http://www.cia-ica.ca/docs/default-source/2014/214118e.pdf</a>
R	CIA Report on the CIA ORSA Survey conducted in April 2015 <a href="http://www.cia-ica.ca/docs/default-source/2016/216036e.pdf">http://www.cia-ica.ca/docs/default-source/2016/216036e.pdf</a>
R	CIA Research Paper on Risk Aggregation and Diversification <a href="http://www.cia-ica.ca/docs/default-source/2016/216037e.pdf">http://www.cia-ica.ca/docs/default-source/2016/216037e.pdf</a>
R	CAS Financial Reporting <a href="http://www.casact.org/library/studynotes/Odomirok-et-al_Financial-Reportingv4.pdf">http://www.casact.org/library/studynotes/Odomirok-et-al_Financial-Reportingv4.pdf</a>
R	International Actuarial Association – ERM Concept and Framework <a href="http://www.actuaries.org/index.cfm?LANG=EN&amp;DSP=AFIR&amp;ACT=LIBRARY">http://www.actuaries.org/index.cfm?LANG=EN&amp;DSP=AFIR&amp;ACT=LIBRARY</a>



*To assist in keeping the above reference list current and relevant to CIA Members, we encourage practitioners to share with the Committee additional documents and references not included in the above list. Please send the information to [ski@cia-ica.ca](mailto:ski@cia-ica.ca).*

**Links to Property and Casualty SOPs:**

- CIA Standards of Practice – <http://www.cia-ica.ca/publications/standards-of-practice>