



NOVA SCOTIA RISK SHARING POOL

OCTOBER 2017 OPERATIONAL REPORT

ACTUARIAL HIGHLIGHTS

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ACTUARIAL HIGHLIGHTS

RSP NOVA SCOTIA

OPERATIONAL REPORT

OCTOBER 2017

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1 Summary

1.1 Valuation Schedule (Fiscal Year 2017)

The October 2017 Operational Report incorporates the results of an updated valuation (as at September 30, 2017) – the impact of the implementation of the valuation is discussed in section 1.2. The table immediately below summarizes the implemented valuations and future scheduled valuations for fiscal year 2017.

NOVA SCOTIA RISK SHARING POOL FISCAL YEAR 2017 – SCHEDULE OF VALUATIONS			
Valuation Date	Discount Rate (per annum)	Operational Report	Description of Changes
Sep. 30, 2016 (completed)	0.51% mfad: 25 bp	Oct. 2016	updated valuation (roll forward): accident year 2016 loss ratio remained at 94.8%; discount rate decreased by 5 basis points; no change to selected margins for adverse deviations
Dec. 31, 2016 (completed)	1.01% mfad: 25 bp	Mar. 2017	updated valuation: accident year 2016 loss ratio decreased 5.0 points to 89.8%; accident year 2017 loss ratio decreased 1.0 points to 96.5%; discount rate increased by 50 basis points; no change to selected margins for adverse deviations
Mar. 31, 2017 (completed)	0.93% mfad: 25 bp	May 2017	updated valuation (roll forward): accident year 2017 loss ratio increased 0.9 points to 97.4%; discount rate decreased by 8 basis points; no change to selected margins for adverse deviations
Jun. 30, 2017 (completed)	1.17% mfad: 25 bp	Aug. 2017	updated valuation: accident year 2017 loss ratio decreased 5.3 points to 92.1%; discount rate increased by 24 basis points; selected margins for adverse deviations were updated
Sep. 30, 2017 (completed)	1.73% mfad: 25 bp	Oct. 2017	updated valuation (roll forward): accident year 2017 loss ratio increased 1.1 points to 93.2%; discount rate increased by 56 basis points; no change to selected margins for adverse deviations

Under the proposed schedule for fiscal year 2017, the “off-half” valuation quarters ending March 31, 2017 and September 30, 2017 would not reflect a full valuation update of assumptions, but would rather “roll-forward” key assumptions from the previous valuation.

1.2 New Valuation

A valuation of the Nova Scotia Risk Sharing Pool (“RSP”) as at September 30, 2017 has been completed since last month’s Operational Report and the results of that valuation have been incorporated into this month’s Report. The valuation was completed by the Facility Association’s internal actuarial group in conjunction with, and approved by, the Appointed Actuary, under the

hybrid model for actuarial services. Additional detail will be provided in an “Actuarial Highlights – Quarterly Valuation” report which we anticipate will be posted to the FA website in early December.

The valuation implementation impact is summarized in the tables below.

Summary of Impact (\$000s) of Implementing Result of Valuation as at September 30, 2017¹

NS	unfav / (fav) for the month and ytd					
	IMPACT in \$000s from changes in:					
	ults & payout patterns			dsct rate	margins	
	Nominal	apv adj.	sub-tot	apv adj.	apv adj.	TOTAL
[1]	[2]	[3]	[4]	[5]	[6]	
PAYs	1,490	106	1,596	(364)	-	1,232
CAY	164	3	167	(189)	-	(22)
Prem Def	42	(20)	22	(207)	-	(185)
TOTAL	1,696	89	1,785	(760)	-	1,025

As indicated in the table above, the incorporation of the new valuation had an estimated **\$1.0 million unfavourable impact** on the month’s net result from operations, adding an estimated 6.9 points (see table below) to the **year-to-date Combined Operating Ratio** to end at **116.4%**.

Summary of Impact (% YTD EP) of Implementing Result of Valuation as at September 30, 2017

NS	ytd EP	14,763 (actual)				
	IMPACT unfav / (fav) as % ytd EP from changes in:					
	ults & payout patterns			dsct rate	margins	
	Nominal	apv adj.	sub-tot	apv adj.	apv adj.	TOTAL
[1]	[2]	[3]	[4]	[5]	[6]	
PAYs	10.1%	0.7%	10.8%	(2.5%)	-	8.3%
CAY	1.1%	-	1.1%	(1.3%)	-	(0.1%)
Prem Def	0.3%	(0.1%)	0.1%	(1.4%)	-	(1.3%)
TOTAL	11.5%	0.6%	12.1%	(5.1%)	-	6.9%

The impact of the nominal changes is shown in column [1] of the two preceding summary tables. The change in the selected nominal ultimates was unfavourable by \$1.7 million overall. This reflects the impact attributable to the changes in the selected ultimate loss ratios (i.e. for each accident year, it is the product of life-to-date earned premium for the accident year and the change in the selected ultimate loss ratio).

The prior accident years overall showed a \$1.5 million unfavourable variance, which is attributed to recorded activity related to a member’s corrections of historical claims transactions. This

¹In these tables, “PAYs” refers to prior accident years, “CAY” refers to the current accident year, and “Prem Def” refers to the provision for premium deficiency or the deferred policy acquisition asset (as applicable). “Nominal” refers to changes excluding any actuarial present value adjustments, whereas “apv adj.” refers to actuarial present value adjustments.

The columns under the heading “ults & payout patterns” reflect the impact of changes in the valuation selected ultimates and claims payment patterns (i.e. based on unchanged selection of discount rates and margins for adverse deviation). The column “dsct rate” reflects the impact of the change in the selected discount rate and the column “margins” reflects the impact of any changes in selected margins for adverse deviations.

unfavourable change is 6.1% of the prior accident years' nominal unpaid balance of \$24.3 million determined at the end of last month (September 2017). As a smaller pool, it is subject to higher levels of process variance, driving volatility in the ultimate selection.

The current accident year and premium deficiency impacts are a result of the changes in the selected loss ratios for accident year **2017** (up 1.1 points from 92.1% to **93.2%**) and **2018** (up 0.2 point from 92.4% to **92.6%**). Generally, as a smaller pool, we would expect more volatility around projections of current and future expected loss ratios.

The impacts related to actuarial present value (“apv”) adjustments are split into the impact prior to any change in the selected discount rate and selected margins for adverse deviations or “MfADs” (at the level they were selected i.e. coverage and accident half-year), the impact of then updating the discount rate, and finally the impact of any changes to the MfADs (at the level they were selected). The changes in actuarial present value adjustments are shown in the summary tables in columns [2], [4], and [5].

Column [2] recognizes that changing the nominal selections also changed the unpaid estimates (including changes to the relative mix by government line, which had an impact on the weighted-average MfADs). It also reflects the fact that we updated the projected emergence of claims payments, resulting in a change in the projected cash flows. These changes generated an unfavourable change of \$89 thousand in the actuarial present value adjustments, prior to any changes in the selected discount rate and/or MfADs.

Claims payment emergence patterns were updated and cash flows were reviewed against the selected risk-free yield curve, derived from Government of Canada benchmark bond yields monthly series using values for September 2017. Column [4] accounts for the change in the **discount rate** selected (increased 56 basis points to **1.73%**), indicating a favourable impact of \$0.8 million. The impact *related only to claims liabilities* (i.e. PAYs plus CAY) was \$0.6 million at October 2017 (projected \$0.8 million impact at December 31, 2017) – this compares to the \$0.6 million change one would estimate as the impact by interpolation using the interest rate sensitivity table provided in last month's Actuarial Highlights.

Column [5] accounts for any changes to selected MfADs. The selected **investment rate MfAD** was **left unchanged at 25 basis points** and the selected **claims development MfADs** at the coverage and accident year level were **left unchanged** as well.

Consideration was given to recent legal decisions and changes in legislation / regulation as outlined in section 1.4.

1.3 Appointed Actuary and Hybrid Actuarial Services Model

Liam McFarlane of Ernst & Young LLP is Facility Association's Appointed Actuary (effective as of June 1, 2013).

Facility Association operates under a “hybrid” model in relation to the management and provision of actuarial services. Under this model, actuarial services are performed by both Facility Association's internal staff and its external actuarial consulting firm. The hybrid model approach maximizes the efficiency of resource allocation while providing access to additional expertise and capacity as needed.

1.4 Consideration of Recent Legal Decisions and Changes in Legislation / Regulation

Consideration and assessment of potential impacts of legal decisions and changes in legislation / regulation constitutes a regular part of the valuation process. Descriptions of some of the more recent changes are provided below (there have been no changes in these descriptions since last month's Highlights).

The **Supreme Court of Canada** rendered its judgment on **Saadati v Moorhead (2017 SCC 28, rendered on Jun 2, 2017)**. Saadati was involved in a collision in July of 2005 in British Columbia and sued the at-fault driver for damages. According to the Supreme Court decision, *“The trial judge found that the ... accident caused S[aadati] psychological injuries, including personality change and cognitive difficulties. ...and awarded S[aadati] \$100,000 for non-pecuniary damages.”* The trial decision was appealed to the BC Court of Appeal where the trial's \$100,000 non-pecuniary award was dismissed. The Supreme Court upheld the \$100,000 non-pecuniary award, determining:

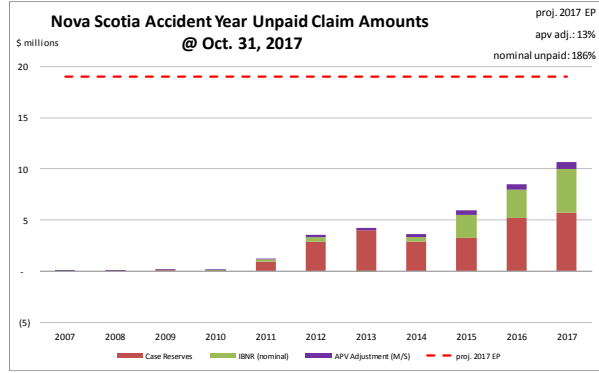
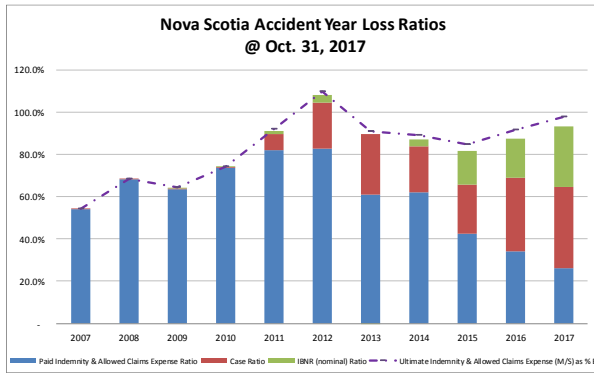
- *“A finding of legally compensable mental injury need not rest, in whole or in part, on the claimant proving a recognized psychiatric injury.”*
- *“...a trier of fact adjudicating a claim of mental injury is not concerned with diagnosis, but with symptoms and their effects.”*
- *“Expert evidence can assist in determining whether or not a mental injury has been shown, but where psychiatric diagnosis is unavailable, it remains open to a trier of fact to find on other evidence adduced by the claimant that he or she has proven on a balance of probabilities the occurrence of mental injury.”*

At the current time, no adjustments have been made to our valuation estimates or views based on the judgment as rendered, but we continue to review and consider the implications of the judgment.

1.5 Current Provision Summary

The charts at the top of the next page show the current levels of claim liabilities² booked by accident year. The left chart displays life-to-date payments, case reserves, IBNR, and the total including actuarial present value adjustments against accident year earned premium. The right chart shows the associated dollar amounts for the components of the claim liabilities and the current projected amount of 2017 full year earned premium (the red hash-mark line) to provide some perspective.

²Claim liabilities refer to provision for unpaid indemnity and allowed claims expenses. Allowed claims expenses are first party legal and other expenses as listed in the RSP Claims Guide. Claims expenses paid through the member company expense allowance are NOT included in this discussion.



"M/S" refers to "Member Statement" values – that is, actuarial present value adjustments at the selected discount rate.

The current actuarial present value adjustments balance (\$2.5 million – see table immediately below) represents 13% of the earned premium projected for the full year 2017 (see the upper right corner of the right chart above). If our current estimates of the nominal unpaid amounts prove to match actual claims payments, the actuarial present value adjustments will be released into the net operating result over future periods.

claim liabilities (\$000s)	amt	%
case	24,868	65.8%
ibnr	10,408	27.5%
M/S apv adjust.	2,544	6.7%
M/S total	37,820	100.0%

The table to the left breaks down the Member Statement (M/S) claim liabilities total into component parts, showing that the largest component of the claim liabilities for this pool is case reserves. Approximately 68% of the IBNR balance relates to accident years 2016 and 2017 (see Exhibit B). Approximately 87% of the M/S

total claim liabilities are related to accident years 2013-2017 inclusive (i.e. the most recent 5 accident years).

The tables immediately below summarize the premium liabilities and the total policy liabilities.

premium liabilities (\$000s)	amt	%
unearned prem	14,527	100.0%
prem def/(dpac)	(820)	(5.6%)
M/S apv adjust.	814	5.6%
M/S total	14,521	100.0%

policy liabilities (\$000s)	amt	%
claim	35,276	67.4%
premium	13,707	26.2%
M/S apv adjust.	3,358	6.4%
M/S total	52,341	100.0%

2 Activity During the Month of October 2017

2.1 Recorded Premium and Claims Activity

The table at the top of the next page summarizes the extent to which premiums and claims amounts recorded during the month differ from projections reflected in the prior month's Operational Report³.

³There may be rounding differences in values in this document compared with the associated Bulletin and/or Operational Report.

Nova Scotia RSP Actual vs Projected Summary: Recorded Transaction Amounts (\$ thousands)

Table 01 Accident Year	Earned Premium		Paid Indemnity & Allowed Claims Expense		Case increase / (decrease)		Recorded increase / (decrease)	
	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected
Prior	-	-	349	232	(464)	(359)	(115)	(127)
2015	(1)	(1)	182	77	(253)	(236)	(71)	(159)
2016	(4)	(4)	48	(245)	121	254	169	9
2017	1,908	(109)	646	104	809	227	1,455	332
TOTAL	1,902	(115)	1,225	169	212	(115)	1,437	54

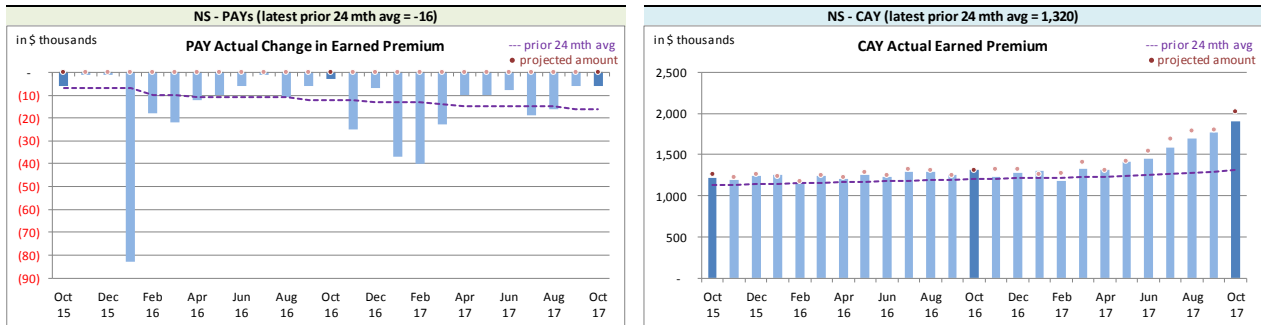
(Recorded transaction amounts exclude IBNR & other actuarial provisions)

Claims transaction activity is generally volatile and changes from one month to the next are anticipated due to this natural “process variance” (i.e. random variation), and this is particularly true where volumes are low as found in this RSP. Each month, the projection variances are reviewed for signs of projection bias and to identify potential ways to reduce the level of the variance. Commentary from our review is provided in the sub-sections that follow.

2.1.a Actual vs. Projected (AvsP): Earned Premium

The charts immediately below show actual **earned premium**⁴ activity in each of the most recent 25 calendar months, along with a “prior 24-month average” to show how each month’s actual compares with the average amount of the preceding 24 calendar months.

Nova Scotia RSP Actual Earned Premium by Calendar Month

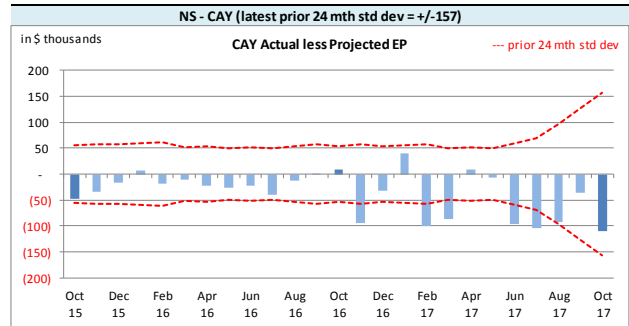
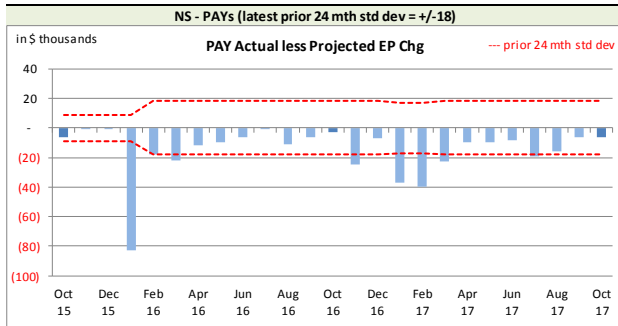


Earned premium changes during a given calendar month in relation to prior accident years tend to be at modest levels, although relatively high levels seem to occur in January each year.

The associated variance between the actual changes and the projections from the previous month are shown in the charts at the top of the next page. **Earned premium** change projections are all attributed to the current accident year as the projection upload does not accept **earned premium** changes for other accident years. We do not see this limitation as being significant for our purposes, but it does mean that the actual less projection variance will equal the actual **earned premium** change in relation to prior accident years.

⁴Premium is earned on a daily basis based on the transaction term measured in days. As a result, months with 31 days earned relatively more than those with 30 days, and February earns the least.

*Nova Scotia RSP Actual vs. Projected Summary: **Earned Premium** Variances by Calendar Month*



On Latest \$ thousands		
Earned Premium	PAYS	CAY
Mthly Avg EP Chg (prior 24 mths)	(16)	1,320
std dev	18	157
A-P <> std dev	7	5
% <> std dev	28.0%	20.0%
norm <> std dev	31.7%	31.7%

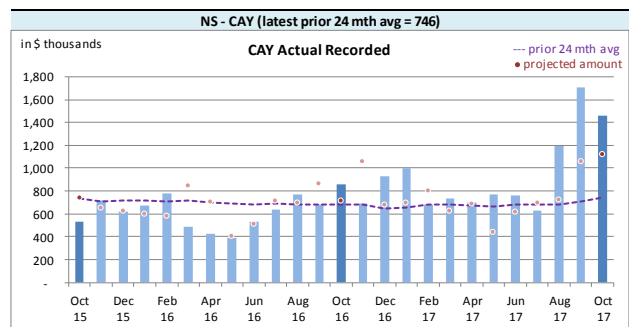
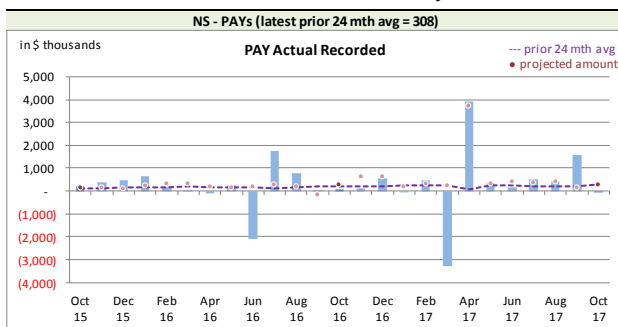
We project **earned premium** changes from known unearned premium and projected written premium levels, but upload the total projections as current accident year (CAY). This process has generated prior accident years' (PAYS) bias⁵, with actuals generally lower than projected. However, the magnitude is not high relative to monthly

premium, and the variances are within the prior 24-month standard deviation slightly more often than indicated by a normal distribution (see left table above). In addition to the PAYS' bias, the CAY has also shown bias, with actuals being generally lower than projected. Starting with the August 2016 projections, we have modified our projections processes in an attempt to account for CAY bias. Over time, we may consider other projection approaches to narrow monthly variance levels further, but it is not currently deemed a priority. Projection variances have also been exacerbated by written premium variances, where our projections, based on information provided by larger RSP users, have been proven to be too high (June variance of \$689 thousand, July variance of \$818 thousand, August variance of \$807 thousand, September variance of \$1.3 million and October variance of \$1.2 million).

2.1.b AvsP: Recorded Indemnity & Allowed Claims Expense

The charts immediately below show actual **recorded** activity (**paid** and case reserve changes), in each of the most recent 25 calendar months, along with a "prior 24-month average" to show how each month's actual compares with the average amount of the preceding 24 calendar months.

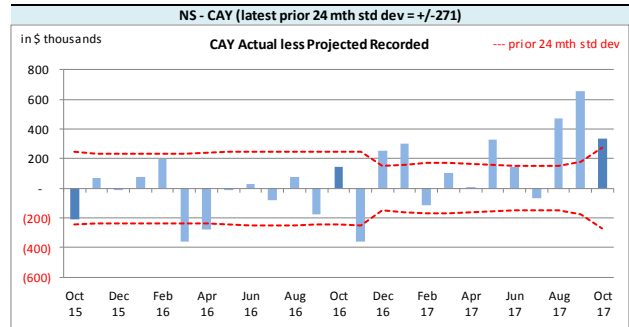
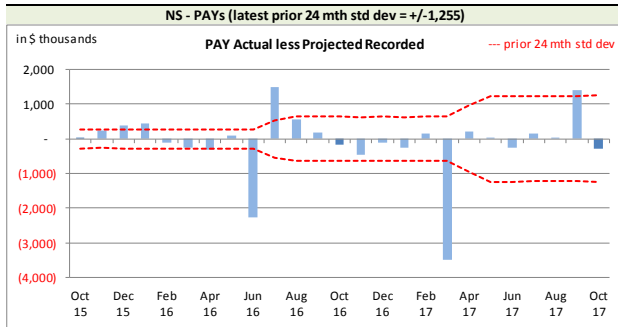
*Nova Scotia RSP Actual **Recorded** by Calendar Month*



⁵The PAYS' variances will show bias as the projection upload forces all earned premium projections to be attributed to the CAY.

Recorded activity variances from the previous month’s projections are shown in the charts below, including the “prior 24-month standard deviation” levels to show how the variances from projection compare with historical standard deviations.

*Nova Scotia RSP Actual vs Projected Summary: **Recorded** Variances by Calendar Month*



On Latest \$ thousands		
Recorded	PAYs	CAY
Mthly Avg Recorded (prior 24 mths)	308	746
std dev	1,255	271
A-P <> std dev	7	9
% <> std dev	28.0%	36.0%
norm <> std dev	31.7%	31.7%

With respect to **recorded** indemnity & allowed claims expense activity, caution must be exercised in reviewing the variances as this is a small pool and single claim transactions that are normal course for the business may look “unusual” and generate relatively “significant” variances that in nominal value terms are not that

significant. That said, for prior accident years’ (PAYs) **recorded** variances (left chart above), the percentage of months (28%) with variances in excess of one standard deviation suggests the projection process performs no better than simply projecting based on a 24-month average.

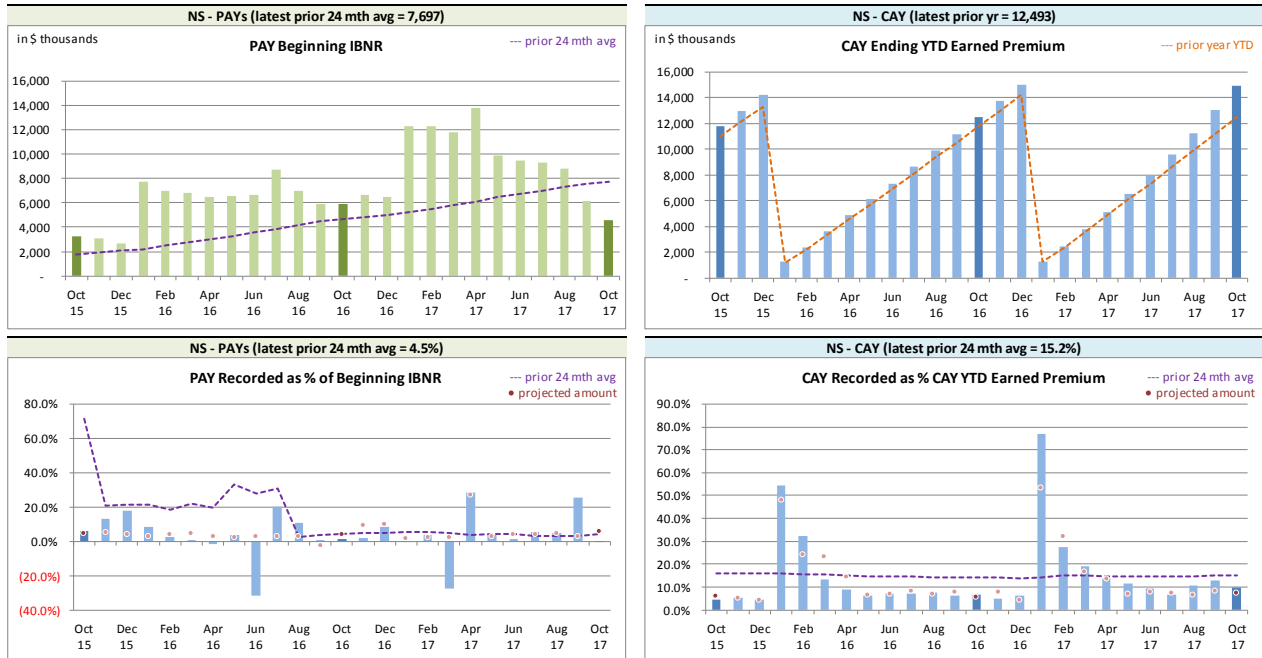
The current accident year (CAY) **recorded** variances (right chart above) have resulted in 36% of the last 24 months generating variances in excess of a 24-month standard deviation, suggesting the projection process performs no better than simply projecting based on a 24-month average. We are considering ways to improve our projection process as a result.

The CAY **recorded** variance for the current month was outside the one standard deviation band. The activity was reviewed and confirmed, with the variance attributed to process variance.

The method for establishing IBNR adjusts automatically for changes in **earned premium** and **recorded** claims activity level (see sections 2.2 and 3).

We have included, for reference, additional charts at the top of the next page related to levels influencing **recorded** activity. Note in particular the increase in the level of PAYs beginning IBNR. Part of this will be as a response to valuations and showing up as a beginning IBNR change one month after the valuation is implemented (i.e. April, June, September, and November), and part will also reflect the maturity level of the RSP.

Nova Scotia RSP Levels that influence⁶ Recorded activity by Calendar Month



We track beginning prior accident years’ IBNR as **recorded** activity “comes out of” IBNR. Changes in the prior accident years’ beginning IBNR (see left chart above) occur for several possible reasons:

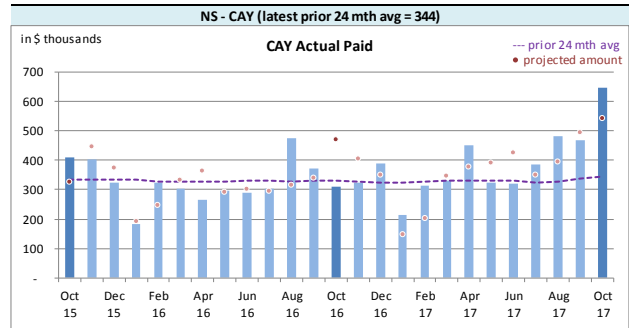
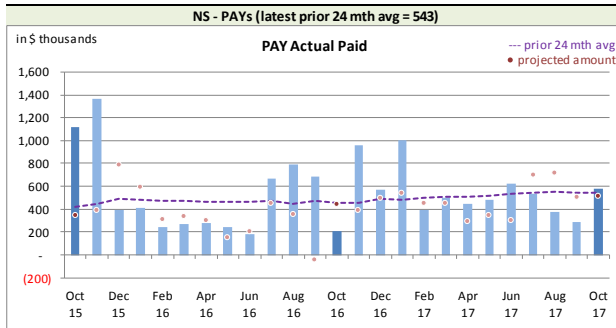
- to offset actual **recorded** activity (through loss ratio matching);
- the annual switchover as a current accident year becomes a prior accident year (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of prior accident years’ ultimate (will show up as a beginning IBNR change one month after the valuation is implemented, i.e. the change will generally show in April, June, September, and November).

2.1.c AvsP: Paid Indemnity & Allowed Claims Expense

The charts at the top of the next page show actual **paid** activity in each of the most recent 25 calendar months, along with a “prior 24-month average” to show how each month’s actual compares with the average amount of the preceding 24 calendar months.

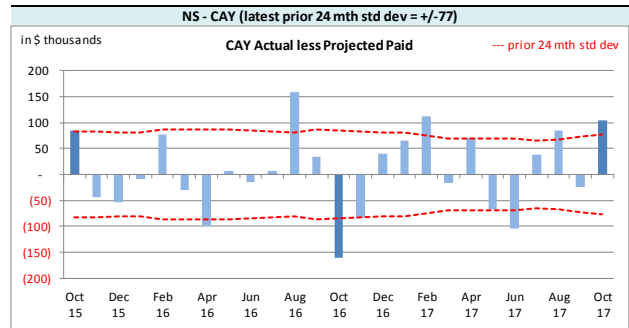
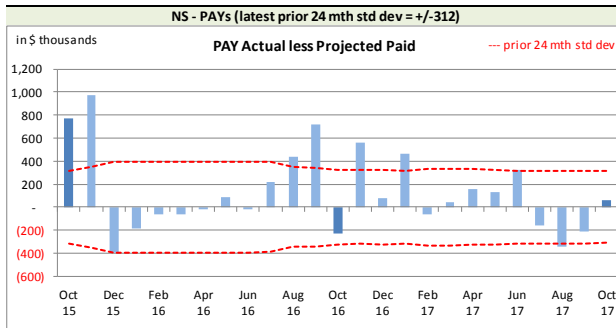
⁶Our recorded activity projections for the prior accident years are based on selected ratios of recorded activity to beginning unpaid balances, whereas the current accident year projections are based on selected ratios of year-to-date IBNR to year-to-date selected ultimate (i.e. selected LR x earned premium), deriving year-to-date recorded as selected ultimate less IBNR. In both cases, the ratio selection is based on our review of the more recent recorded activity and recent AvsP analyses.

*Nova Scotia RSP Actual **Paid** by activity Calendar Month*



Paid activity variances from the previous month’s projections are shown in the charts below, including the “prior 24-month standard deviation” levels to show how the variances from projection compare with historical standard deviations.

*Nova Scotia RSP Actual vs Projected Summary: **Paid** Variances by Calendar Month*



On Latest \$ thousands			
	Paid	PAYs	CAY
Mthly Avg Paid (prior 24 mths)		543	344
std dev		312	77
A-P <> std dev		9	9
% <> std dev		36.0%	36.0%
norm <> std dev		31.7%	31.7%

With respect to **paid** indemnity & allowed claims expense activity, caution must be exercised in reviewing the variances as this is a small pool and single claim transactions that are normal course for the business may look “unusual” and generate relatively “significant” variances that in nominal value terms are not that significant.

With 36% of months with prior accident years (PAYs) **paid** variances in excess of a prior 24-month standard deviation (see table above), this suggests the projection process has performed no better than simply projecting based on the previous 24-month average. We do not see evidence of bias in the projections.

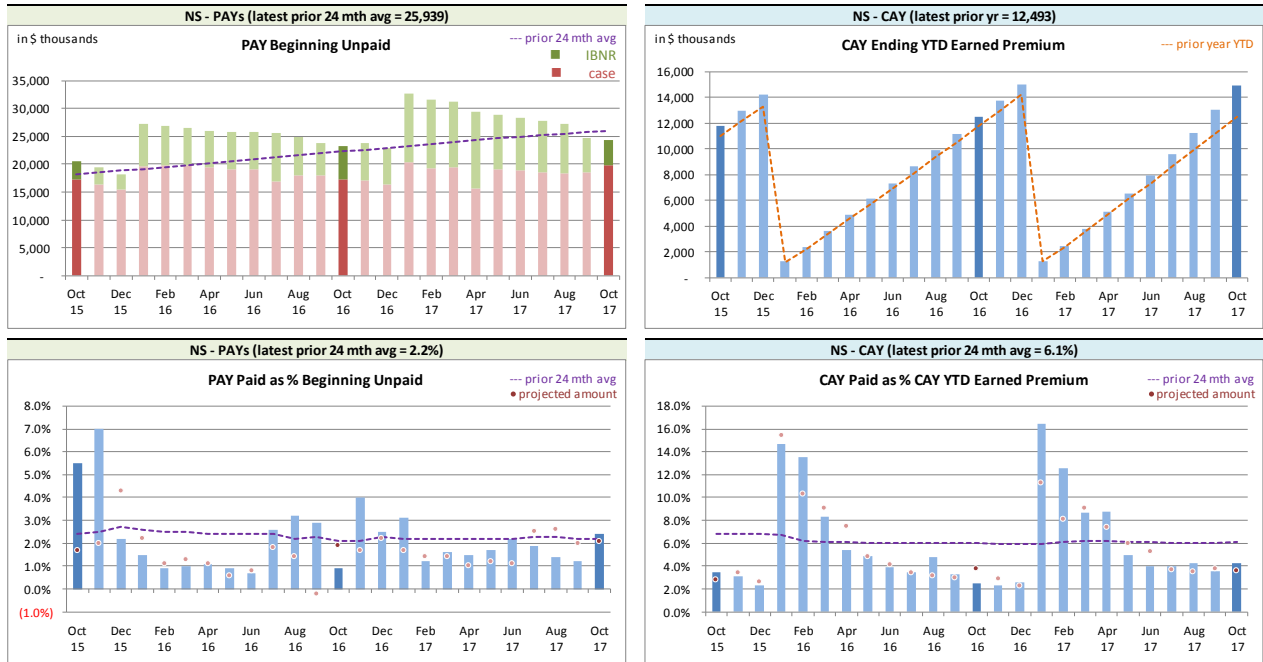
The current accident year (CAY) **paid** variances (see right chart above), do not appear to indicate bias. At 36% of projections outside of one standard deviation (see table above), the projection process seems to have performed no better than simply projecting based on the previous 24-month average.

The CAY **paid** variance for the current month was outside the one standard deviation band. The activity was reviewed and confirmed, with the variance attributed to process variance.

We have included, for reference, additional charts at the top of the next page related to levels influencing **paid** activity. Both case and IBNR increases contribute to the increase of PAYs

beginning unpaid. This is somewhat expected, given the maturity level of the RSP.

Nova Scotia RSP Levels that influence⁷ Paid activity by Calendar Month



We track beginning prior accident years’ unpaid balance (case and IBNR) as **paid** activity “comes out of” the unpaid balance. Changes in the prior accident years’ beginning unpaid balance (see upper left chart above) occur for several possible reasons:

- to offset actual **paid** activity (may reduce case or IBNR or both);
- the annual switchover as a current accident year becomes a prior accident year (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of prior accident years’ ultimate (will show up as a beginning unpaid balance change one month after the valuation is implemented, i.e. the change will generally show in April, June, September, and November).

2.2 Actuarial Provisions

An “ultimate loss ratio matching method” (described in section 3) was used to determine the month’s IBNR⁸, and factors were applied to the nominal unpaid claims liability (case plus IBNR) to determine the discount amount (shown as a negative value to indicate its impact of reducing the liability) and the Provisions for Adverse Deviations. The loss ratios and the factors used to determine the current month’s provisions and projections were based on the applicable valuation.

⁷Our paid projections for the prior accident years are based on selected ratios of paid to beginning unpaid balances, whereas the current accident year projections are based on selected ratios of year-to-date paid to year-to-date selected ultimate indemnity (i.e. selected LR x earned premium). In both cases, the ratio selection is based on our review of the more recent recorded activity and recent AvsP analyses.

⁸For ease of discussion, “IBNR” is used in place of “provisions for incurred but not recorded (IBNR) and development”.

The table immediately below summarizes variances in provisions included in the October 2017 Operational Report and the associated one-month projections from last month’s Report.

Nova Scotia RSP Actual vs Projected Summary: IBNR and APV Amounts (\$ thousands)

Table 02

Accident Year	IBNR		actuarial present value adjustments				IBNR + actuarial present value adjustments	
	Actual	Actual less Projected	Discount Amount		Provisions for Adverse Deviations		Actual	Actual less Projected
			Actual	Actual less Projected	Actual	Actual less Projected		
Prior	1,091	543	(427)	(134)	1,283	6	1,947	415
2015	2,258	579	(230)	(86)	672	23	2,700	516
2016	2,768	641	(389)	(157)	969	84	3,348	568
2017	4,291	(268)	(530)	(169)	1,196	(35)	4,957	(472)
TOTAL	10,408	1,495	(1,576)	(546)	4,120	78	12,952	1,027

The IBNR provision is \$1.5 million higher than projected from last month, counterbalancing the recorded claims activity and adjusting for the earned premium variance impacts indicated in section 2.1, and due to the valuation implementation.

Exhibit G shows the accident year IBNR amount change from last month to this month broken down into:

- (i) the change projected last month;
- (ii) the additional change due to variances in earned premium (because we apply a loss ratio to earned premium in determining ultimate level) and/or recorded claims (as IBNR is calculated as ultimate less recorded) differences; and
- (iii) the additional change due to valuation implementation impacts (as applicable)

The variances associated with (ii) above are discussed in sections 2.1.a and 2.1.b.

The table at the top of the next page summarizes the variances in the provisions for premium deficiency liability / (deferred policy acquisition cost asset) included in the October 2017 Operational Report and the one-month projections from last month’s Report. This RSP is in a deferred policy acquisition cost asset position (shown as a negative value) prior to and after actuarial present value adjustments. Actuarial present value adjustments increase the expected future policy obligations (costs) associated with the unearned premium and cause the write down of the asset value and the creation of the liability. The variances noted are mainly driven by the unearned premium variance and due to valuation implementation.

Nova Scotia RSP Actual vs Projected Summary: Premium Deficiency / (DPAC) Amounts (\$ thousands)

Table 03

	Premium Deficiency / (Deferred Policy Acquisition Costs)		actuarial present value adjustments		Premium Deficiency / (DPAC) including actuarial present value adjustments	
	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected
balance:	(820)	102	814	(301)	(6)	(199)
balance as % unearned premium:	(5.6%)	0.3%	5.6%	(1.5%)	-	(1.2%)
actual unearned premium:	14,527					
less projected:	(1,035)					

3 Ultimate Loss Ratio Matching Method

An “ultimate loss ratio matching method” continues to be applied to the current month and two projected months shown in the Operational Reports, with IBNR determined by accident year as follows:

- (a) Earned premium to-date
- (b) Ultimate loss⁹ ratio per latest valuation
- (c) Estimated ultimate incurred = (a) x (b)
- (d) Recorded indemnity & allowed claims expense to-date
- (e) IBNR = (c) – (d)

4 Calendar Year-to-Date Results

The table at the top of the next page summarizes the calendar year-to-date results for indemnity & allowed claims expenses¹⁰, including IBNR.

In calculating the amounts as percentages of earned premium, the calendar year-to-date earned premium has been used, which includes not only the earned premium associated with the current accident year, but also earned premium adjustments related to prior accident years. Specifically, the current accident year (CAY) ratio in the table is 94.3% rather than 93.2% (the valuation ultimate ratio for accident year 2017), as the calendar year-to-date earned premium includes prior accident year earned premium adjustments. (Note that the ratios in this table may differ slightly from those shown in the Nova Scotia RSP Summary of Operations due to rounding.)

⁹“Loss” here refers to indemnity and allowed claims expenses, but does not include the claims expense allowance included in member company overall expense allowances (“Expense Allowance” in the Operational Report).

¹⁰Allowed claims expenses are first party legal and other expenses as listed in the RSP Claims Guide. Claims expenses paid through the member company expense allowance are NOT included in this analysis.

Nova Scotia RSP Calendar Year-to-Date Indemnity & Allowed Claims Expense Summary (\$ thousands)

Table 04	YTD Nominal Values		YTD actuarial present value adjustment		YTD Total		Change from Prior Month YTD	
	Amount	% EP	Amount	% EP	Amount	% EP	Amount	LR pts
PAYs	(2,136)	(14.5%)	(1,695)	(11.5%)	(3,831)	(25.9%)	1,177	13.0%
CAY	13,922	94.3%	666	4.5%	14,588	98.8%	1,833	(0.4%)
TOTAL	11,786	79.8%	(1,029)	(7.0%)	10,757	72.9%	3,010	12.7%

(“% EP” based on 2017 calendar year-to-date earned premium; ratios may not total due to rounding)

The prior accident years (PAYs) changes from last month are due to the release of the actuarial present value adjustments with claims payments and due to valuation implementation. The loss ratio change year-to-date reflects not only changes in the prior accident year levels, but also the increase in the calendar year-to-date earned premium with an additional month’s earned premium and the valuation implementation.

For the current accident year (CAY), changes in the year-to-date total reflects the additional month’s exposure and regular changes to actuarial present value adjustments as the year ages and due to the valuation implementation.

5 Current Operational Report – Additional Exhibits

Section 6 provides exhibits pertaining to the actuarial provisions reflected in the current month’s Operational Report.

IBNR (including actuarial present value adjustments) presented in section 6, Exhibit A, were derived on a discounted basis, and therefore reflect the time value of money and include an explicit provision for adverse deviations in accordance with accepted actuarial practice in Canada.

IBNR presented in section 6, Exhibit B, does NOT include any actuarial present value adjustments. The “Total IBNR” from this exhibit is shown in the Operational Report as “Undiscounted IBNR”.

The ultimate loss ratios detailed in section 6, Exhibit B, refer to the estimates derived on the basis of various actuarial methodologies applied to the experience of the Nova Scotia Risk Sharing Pool for the purposes of the most recent quarterly valuation. As discussed in section 3, IBNR reflected in the current month’s Operational Report was derived as the difference between the estimated ultimate for the claims amount (i.e. earned premium x ultimate loss ratio) and the associated current recorded amounts (life-to-date payments plus current case reserves).

6 EXHIBITS

The exhibits listed below are provided on the pages that follow:

- EXHIBIT A IBNR for Member Sharing – includes Actuarial Present Value Adjustments
- EXHIBIT B IBNR
- EXHIBIT C Premium Liabilities
- EXHIBIT D Projected Year-end Policy Liabilities
- EXHIBIT E Discount Rate & Margins for Adverse Deviations
- EXHIBIT F Interest Rate Sensitivity
- EXHIBIT G Components of IBNR Change During Month

EXHIBIT A

IBNR for Member Sharing – includes Actuarial Present Value Adjustments

TABLE EXHIBIT A

		Amounts in \$000s					
IBNR + M/S actuarial present value adjustments		Accident Year	Actual Sep. 2017	Actual Oct. 2017	Projected Nov. 2017	Projected Dec. 2017	Projected Dec. 2018
	2007		4	2	2	2	2
	2008		41	7	7	7	7
	2009		31	57	56	56	55
	2010		41	19	19	19	19
	2011		81	284	281	278	245
discount rate	2012		721	690	683	676	615
1.73%	2013		231	186	174	165	143
	2014		401	702	688	676	488
interest rate margin	2015		2,282	2,700	2,579	2,364	1,557
25 basis pts	2016		2,967	3,348	3,197	3,108	2,047
	2017		4,579	4,957	5,380	5,774	4,359
	2018		-	-	-	-	9,903
	TOTAL		11,379	12,952	13,066	13,125	19,440
	Change			1,573	114	59	

Please see Exhibit G, page 1 for Components of Change during Current Month

EXHIBIT B

IBNR

TABLE EXHIBIT B

Amounts in \$000s

IBNR	Ultimate Loss Ratio	Accident Year	Actual Sep. 2017	Actual Oct. 2017	Projected Nov. 2017	Projected Dec. 2017	Projected Dec. 2018
	54.3%	2007	1	1	1	1	1
	68.3%	2008	37	5	5	5	5
	64.1%	2009	19	47	47	47	47
	74.1%	2010	27	14	14	14	14
	91.1%	2011	(11)	201	199	197	173
	107.9%	2012	473	477	472	467	415
	89.2%	2013	(78)	(66)	(63)	(60)	(49)
	86.9%	2014	92	412	400	396	272
	81.6%	2015	1,767	2,258	2,145	1,952	1,178
	87.6%	2016	2,287	2,768	2,630	2,551	1,540
	93.2%	2017	3,824	4,291	4,634	4,949	3,647
	92.4%	2018	-	-	-	-	8,452
		TOTAL	8,438	10,408	10,484	10,519	15,695
		Change		1,970	76	35	

Please see Exhibit G, page 2 for Components of Change during Current Month

EXHIBIT C

Premium Liabilities

TABLE EXHIBIT C

	Amounts in \$000s				
	Actual Sep. 2017	Actual Oct. 2017	Projected Nov. 2017	Projected Dec. 2017	Projected Dec. 2018
Premium Liabilities					
(1) unearned premium (UP)	13,920	14,527	15,019	14,979	19,753
FOR MEMBER SHARING					
(2) expected future costs ratio {% of (1)}	101.2%	100.0%	99.9%	99.7%	102.4%
(3) expected future costs {(1) x (2)}	14,086	14,521	14,997	14,941	20,221
(4) premium deficiency / (deferred policy acquisition cost)	166	(6)	(22)	(38)	468
Excluding Actuarial Present Value Adjustments					
(5) expected future costs ratio {% of (1)}	94.0%	94.4%	94.3%	94.2%	96.6%
(6) expected future costs {(1) x (5)}	13,089	13,707	14,156	14,104	19,089
(7) premium deficiency / (deferred policy acquisition cost)	(831)	(820)	(863)	(875)	(664)

EXHIBIT D

Projected Year-end Policy Liabilities

The table below presents the projected policy liabilities as at December 31, 2017, broken down by component.

Nova Scotia		Projected Balances as at Dec. 31, 2017 (\$000s)								
ending 2017		nominal values			actuarial present value adjustments (apvs)					
Acc Yr	Case	IBNR	Total Unpaid	discount	investment PfAD	nominal development PfAD	development PfAD discount	Total apvs	TOTAL	
2007	7	1	8	-	-	1	-	1	9	
2008	12	5	17	-	-	2	-	2	19	
2009	66	47	113	(2)	-	11	-	9	122	
2010	55	14	69	(2)	-	7	-	5	74	
2011	920	197	1,117	(32)	4	112	(3)	81	1,198	
2012	2,783	467	3,250	(124)	20	325	(12)	209	3,459	
2013	3,563	(60)	3,503	(130)	18	350	(13)	225	3,728	
2014	2,767	396	3,163	(114)	16	392	(14)	280	3,443	
2015	3,141	1,952	5,093	(214)	31	621	(26)	412	5,505	
2016	5,065	2,551	7,616	(373)	53	922	(45)	557	8,173	
PAYs (sub-total):	18,379	5,570	23,949	(991)	142	2,743	(113)	1,781	25,730	
CAY (2017)	7,423	4,949	12,372	(656)	87	1,472	(78)	825	13,197	
claims liabilities:	25,802	10,519	36,321	(1,647)	229	4,215	(191)	2,606	38,927	
	Unearned Premium	Premium Deficiency / (DPAC)	Total Provision	discount	investment PfAD	nominal development PfAD	development PfAD discount	Total apvs	TOTAL*	
premium liabilities:	14,979	(875)	14,104	(609)	83	1,425	(62)	837	14,941	
*Total may not be sum of parts, as apvs apply to future costs within UPR										
policy liabilities:			50,425	(2,256)	312	5,640	(253)	3,443	53,868	

EXHIBIT E

Discount Rate & Margins for Adverse Deviations

The tables below present selected margins for adverse development by coverage (the total is a weighted average, based on the unpaid claims projection for December 31, 2017 from the valuation), followed by the selected discount rate and the associated margin for investment income.

Selected Claims Development MfADs (Sep. 30, 2017)

Accident Year	Third Party Liability	Accident Benefits	Other Coverages	Total
	Margins	Margins	Margins	Margins
2007	10.0%	10.0%	10.0%	10.0%
2008	10.0%	10.0%	10.0%	10.0%
2009	10.0%	10.0%	10.0%	10.0%
2010	10.0%	10.0%	10.0%	10.0%
2011	10.0%	10.0%	10.0%	10.0%
2012	10.0%	10.0%	10.0%	10.0%
2013	10.0%	10.0%	10.0%	10.0%
2014	12.5%	10.0%	8.4%	12.4%
2015	12.4%	10.0%	6.8%	12.2%
2016	12.4%	10.0%	6.8%	12.1%
2017	12.4%	10.0%	5.8%	11.9%
2018	12.0%	10.0%	5.1%	10.3%
prem liab	12.0%	10.0%	5.1%	10.3%

discount rate: 1.73%
margin (basis points): 25

EXHIBIT F
Interest Rate Sensitivity

The tables below present sensitivity to the member statement claims liability as projected to Dec. 31, 2017 from the latest valuation date (projections in exhibits A to D are also to Dec. 31, 2017, but are based on more up-to-date information). We have included both the most recent valuation selection (1.73%), the prior valuation assumption (1.17%) and the prior fiscal year end valuation assumption (0.51%) for comparative purposes. A 25 basis point margin for investment return adverse deviation is used in all scenarios presented.

\$ Format: \$000s

Actuarial Present Value of Provisions at Various Discount Rates - Dec. 31, 2017 projected Unpaid								
AY	0.73%	1.23%	1.73%	2.23%	2.73%	3.23%	1.17%	0.51%
2007	38	37	37	37	36	36	37	38
2008	10	10	10	10	10	10	10	10
2009	94	94	93	93	93	92	94	94
2010	135	134	133	132	131	130	134	135
2011	1,140	1,130	1,121	1,111	1,102	1,093	1,131	1,144
2012	3,419	3,382	3,344	3,308	3,273	3,238	3,386	3,436
2013	3,816	3,774	3,734	3,695	3,656	3,619	3,779	3,834
2014	3,485	3,449	3,413	3,377	3,343	3,309	3,453	3,502
2016	8,131	8,012	7,898	7,786	7,677	7,571	8,027	8,184
2017	13,925	13,704	13,492	13,284	13,083	12,886	13,731	14,024
Total	39,987	39,450	38,929	38,421	37,926	37,442	39,514	40,227
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

Dollar Impact Relative to Valuation Assumption								
AY	0.73%	1.23%	1.73%	2.23%	2.73%	3.23%	1.17%	0.51%
Total	1,058	521	-	(508)	(1,003)	(1,487)	585	1,298
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

Percentage Impact Relative to Valuation Assumption								
AY	0.73%	1.23%	1.73%	2.23%	2.73%	3.23%	1.17%	0.51%
2007	2.7%	-	-	-	(2.7%)	(2.7%)	-	2.7%
2008	-	-	-	-	-	-	-	-
2009	1.1%	1.1%	-	-	-	(1.1%)	1.1%	1.1%
2010	1.5%	0.8%	-	(0.8%)	(1.5%)	(2.3%)	0.8%	1.5%
2011	1.7%	0.8%	-	(0.9%)	(1.7%)	(2.5%)	0.9%	2.1%
2012	2.2%	1.1%	-	(1.1%)	(2.1%)	(3.2%)	1.3%	2.8%
2013	2.2%	1.1%	-	(1.0%)	(2.1%)	(3.1%)	1.2%	2.7%
2014	2.1%	1.1%	-	(1.1%)	(2.1%)	(3.0%)	1.2%	2.6%
2016	3.0%	1.4%	-	(1.4%)	(2.8%)	(4.1%)	1.6%	3.6%
2017	3.2%	1.6%	-	(1.5%)	(3.0%)	(4.5%)	1.8%	3.9%
Total	2.7%	1.3%	-	(1.3%)	(2.6%)	(3.8%)	1.5%	3.3%
	curr - 100 bp	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	prior val assumption	prior fyr end assumption

EXHIBIT G

Page 1 of 2

Components of Member Statement IBNR (i.e. “Discounted”) Change During Month

RSP Nova Scotia
AccountCode Desc IBNR - Discou

M/S IBNR - in \$000s

AccYear	Values				Sum of Total Change	Sum of % Total Change	Sum of Current Month Final Amount
	Sum of Prior Month Actual Amount	Sum of Projected Change	Sum of Change Due to AvsP Variances	Sum of Change Due to Valuation Implementation			
2007	4	-	(2)	-	(2)	(50.0%)	2
2008	41	(1)	1	(34)	(34)	(82.9%)	7
2009	31	-	42	(16)	26	83.9%	57
2010	41	(1)	11	(32)	(22)	(53.7%)	19
2011	81	(1)	201	3	203	250.6%	284
2012	721	(11)	(79)	59	(31)	(4.3%)	690
2013	231	(1)	(111)	67	(45)	(19.5%)	186
2014	401	(4)	43	262	301	75.1%	702
2015	2,282	(98)	150	366	418	18.3%	2,700
2016	2,967	(187)	11	557	381	12.8%	3,348
2017	4,579	850	(450)	(22)	378	8.3%	4,957
Grand Total	11,379	546	(183)	1,210	1,573	13.8%	12,952

EXHIBIT G

Components of IBNR (i.e. “Undiscounted”) Change During Month

RSP Nova Scotia
AccountCode Desc IBNR - Undiscounted

IBNR - in \$000s

AccYear	Values				Sum of Total Change	Sum of % Total Change	Sum of Current Month Final Amount
	Sum of Prior Month Actual Amount	Sum of Projected Change	Sum of Change Due to AvsP Variances	Sum of Change Due to Valuation Implementation			
2007	1	-	-	-	-	-	1
2008	37	(1)	1	(32)	(32)	(86.5%)	5
2009	19	-	42	(14)	28	147.4%	47
2010	27	(1)	17	(29)	(13)	(48.1%)	14
2011	(11)	-	200	12	212	(1,927.3%)	201
2012	473	(9)	(79)	92	4	0.8%	477
2013	(78)	2	(100)	110	12	(15.4%)	(66)
2014	92	(3)	46	277	320	347.8%	412
2015	1,767	(88)	158	421	491	27.8%	2,258
2016	2,287	(160)	(12)	653	481	21.0%	2,768
2017	3,824	735	(432)	164	467	12.2%	4,291
Grand Total	8,438	475	(159)	1,654	1,970	23.3%	10,408