



NOVA SCOTIA RISK SHARING POOL

AUGUST 2017 OPERATIONAL REPORT

ACTUARIAL HIGHLIGHTS

Related Bulletin: [F17-077 Nova Scotia RSP August 2017 Operational Report](#)

Related Quarterly Valuation Highlights:

[Actuarial Quarterly Valuation Highlights Risk Sharing Pools as at June 30, 2017](#)

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Should you require any further information, please call Shawn Doherty, Senior Vice President Actuarial & CFO at (416) 644-4968.

ACTUARIAL HIGHLIGHTS

RSP NOVA SCOTIA

OPERATIONAL REPORT

AUGUST 2017

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1 Summary

1.1 Valuation Schedule (Fiscal Year 2017)

The August 2017 Operational Report incorporates the results of an updated valuation (as at June 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	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		Oct. 2017	update valuation (roll forward):

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 June 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 to be posted to the FA website at the same time as this report.

The valuation implementation impact is summarized in the tables below.

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

NS	unfav / (fav) for the month and ytd					
	IMPACT in \$000s from changes in:					
	ults & payout patterns			dsct rate	margins	TOTAL
	Nominal	apv adj.	sub-tot	apv adj.	apv adj.	
[1]	[2]	[3]	[4]	[5]	[6]	
PAYS	(2,149)	(234)	(2,383)	(148)	(87)	(2,618)
CAY	(597)	(61)	(658)	(60)	-	(718)
Prem Def	(683)	(68)	(751)	(78)	-	(829)
TOTAL	(3,429)	(363)	(3,792)	(286)	(87)	(4,165)

As indicated in the table above, the incorporation of the new valuation had an estimated **\$4.2 million favourable impact** on the month's net result from operations, subtracting an estimated 37.5 points (see table below) to the **year-to-date Combined Operating Ratio** to end at **97.5%**.

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

NS	ytd EP 11,098 (actual)					
	IMPACT unfav / (fav) as % ytd EP from changes in:					
	ults & payout patterns			dsct rate	margins	TOTAL
	Nominal	apv adj.	sub-tot	apv adj.	apv adj.	
[1]	[2]	[3]	[4]	[5]	[6]	
PAYS	(19.4%)	(2.1%)	(21.5%)	(1.3%)	(0.8%)	(23.6%)
CAY	(5.4%)	(0.5%)	(5.9%)	(0.5%)	-	(6.5%)
Prem Def	(6.2%)	(0.6%)	(6.8%)	(0.7%)	-	(7.5%)
TOTAL	(30.9%)	(3.3%)	(34.2%)	(2.6%)	(0.8%)	(37.5%)

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 favourable by \$3.4 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 \$2.1 million favourable variance, which is attributed to favourable recorded activity variances beyond what we would consider process variance (or random variation). This favourable change is 7.7% of the prior accident years' nominal unpaid balance of \$27.2 million determined at the end of last month (July 2017). As a smaller pool, it is subject to

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.

higher levels of process variance, driving volatility in the ultimate selection, but as indicated, the favourable recorded activity variance was more than we would consider “random” and have adjusted our ultimate selections accordingly.

The current accident year and premium deficiency impacts are a result of the changes in the selected loss ratios for accident year **2017** (down 5.3 points from 97.4% to **92.1%**) and **2018** (down 5.5 points from 97.9% to **92.4%**). Generally, as a smaller pool, we would expect more volatility around projections of current and future expected loss ratios. However, these changes reflect various updated assumptions, and are beyond what we would “expect” in terms of point movements of estimated “mean” loss ratios, with the decreases in response to continued favourable valuation recorded activity variances over recent periods. Additional detail is provided in an “Actuarial Highlights – Quarterly Valuation” report posted to the FA website at the same time as this report.

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 a favourable change of \$0.4 million 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 June 2017. Column [4] accounts for the change in the **discount rate** selected (increased 24 basis points to **1.17%**), indicating a favourable impact of \$0.3 million. The impact *related only to claims liabilities* (i.e. PAYs plus CAY) was \$0.2 million at August 2017 (projected \$0.2 million impact at December 31, 2017) – this compares to the \$0.3 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**. However, the selected **claims development MfADs** were updated for some accident years and coverages, resulting in an estimated overall favourable impact of \$87 thousand.

Consideration was given to recent legal decisions and changes in legislation / regulation as outlined in the 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:

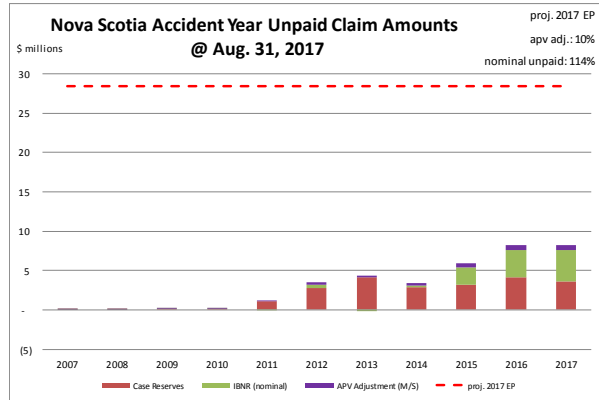
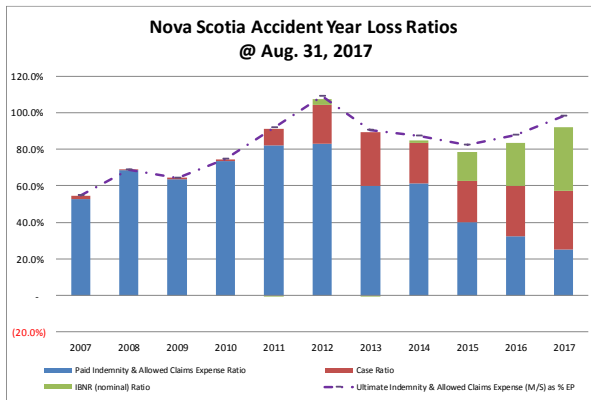
- "*A finding of legally compensable mental injury need not rest, in whole or in part, on the claimant proving a recognized psychiatric injury.*"
- "*...a trier of fact adjudicating a claim of mental injury is not concerned with diagnosis, but with symptoms and their effects.*"
- "*Expert evidence can 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 (\$2.9 million – see table immediately below) represents 10% 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	22,134	63.1%
ibnr	10,093	28.8%
M/S apv adjust.	2,872	8.2%
M/S total	35,099	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 73% of the IBNR balance relates to accident years 2016 and 2017 (see Exhibit B). Approximately 86% 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	12,647	98.9%
prem def/(dpac)	(758)	(5.9%)
M/S apv adjust.	905	7.1%
M/S total	12,794	100.0%

policy liabilities (\$000s)	amt	%
claim	32,227	67.3%
premium	11,889	24.8%
M/S apv adjust.	3,777	7.9%
M/S total	47,893	100.0%

2 Activity During the Month of August 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)

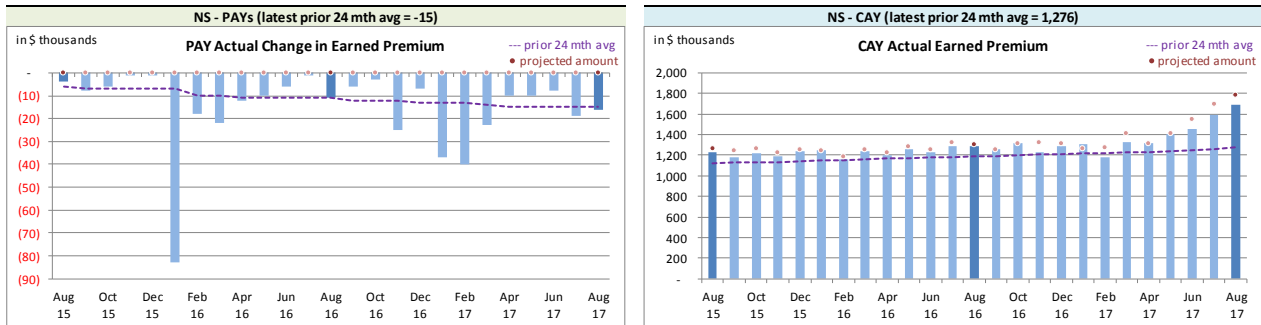
Accident Year	Earned Premium		Paid Indemnity & Allowed Claims Expense		Case increase / (decrease)		Recorded increase / (decrease)	
	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected	Actual	Actual less Projected
Prior	-	-	128	(147)	43	267	171	120
2015	(3)	(3)	112	(70)	(61)	7	51	(63)
2016	(12)	(12)	138	(122)	56	84	193	(39)
2017	1,692	(92)	480	85	713	388	1,194	474
TOTAL	1,677	(108)	857	(254)	751	746	1,609	492

(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.

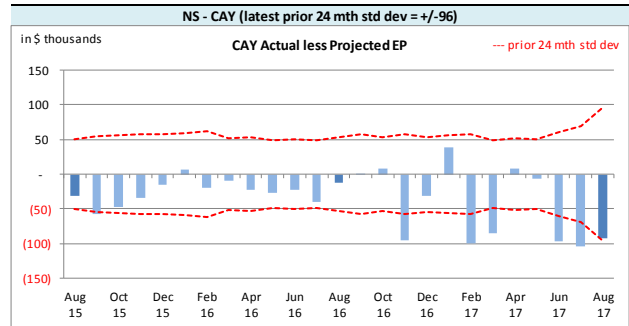
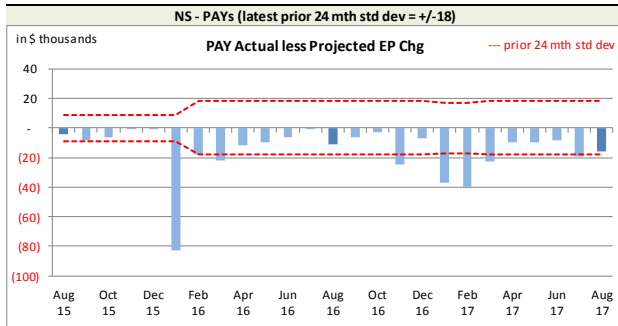
Nova Scotia RSP Actual Earned Premium by Calendar Month


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)	(15)	1,276
std dev	18	96
A-P <> std dev	7	6
% <> std dev	28.0%	24.0%
norm <> std dev	31.7%	31.7%

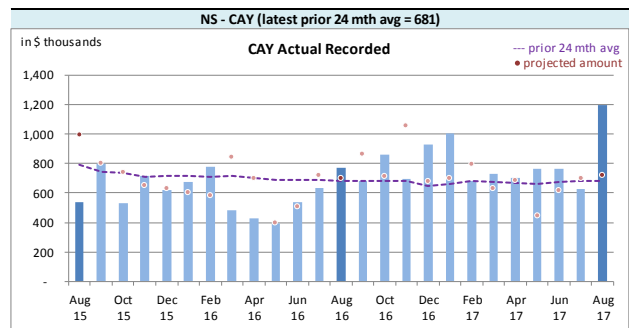
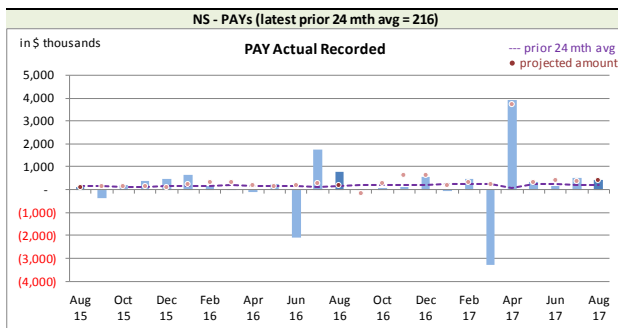
We project **earned premium** changes from known unearned premium and projected written premium levels, but upload the total projections as current accident year (CAY). This process has generated prior accident years' (PAYS) bias⁵, with actuals generally lower than projected. However, the magnitude is 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 \$689 thousand, last month variance of \$818 thousand, this month of \$807 thousand).

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.

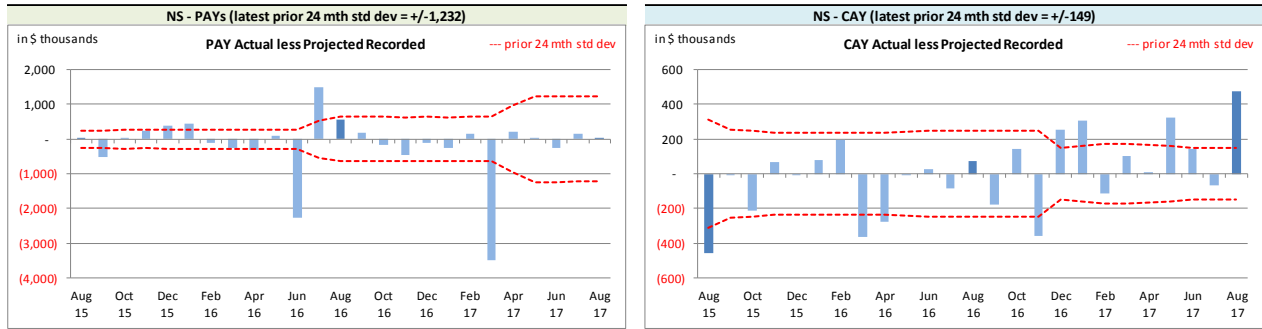
Nova Scotia RSP Actual Recorded by Calendar Month



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)	216	681
std dev	1,232	149
A-P <> std dev	7	8
% <> std dev	28.0%	32.0%
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.

As noted for the past few months, a member is in the process of completing a comprehensive review of their open claims transactions as reported to the FA RSP system. Our review over the three months July-September 2016 noted that correcting transactions were posted to reverse claim closures (and associated case reserve takedowns) posted by this member during the prior month (June 2016). Our investigation and discussion with the member continues, in conjunction with review by the FA internal audit team, to ensure our records are accurate in relation to their own records on their RSP claims portfolio. It is management’s current understanding that the issues will be resolved during the month of September.

The current accident year (CAY) **recorded** variances (right chart above) have resulted in 32% of 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.

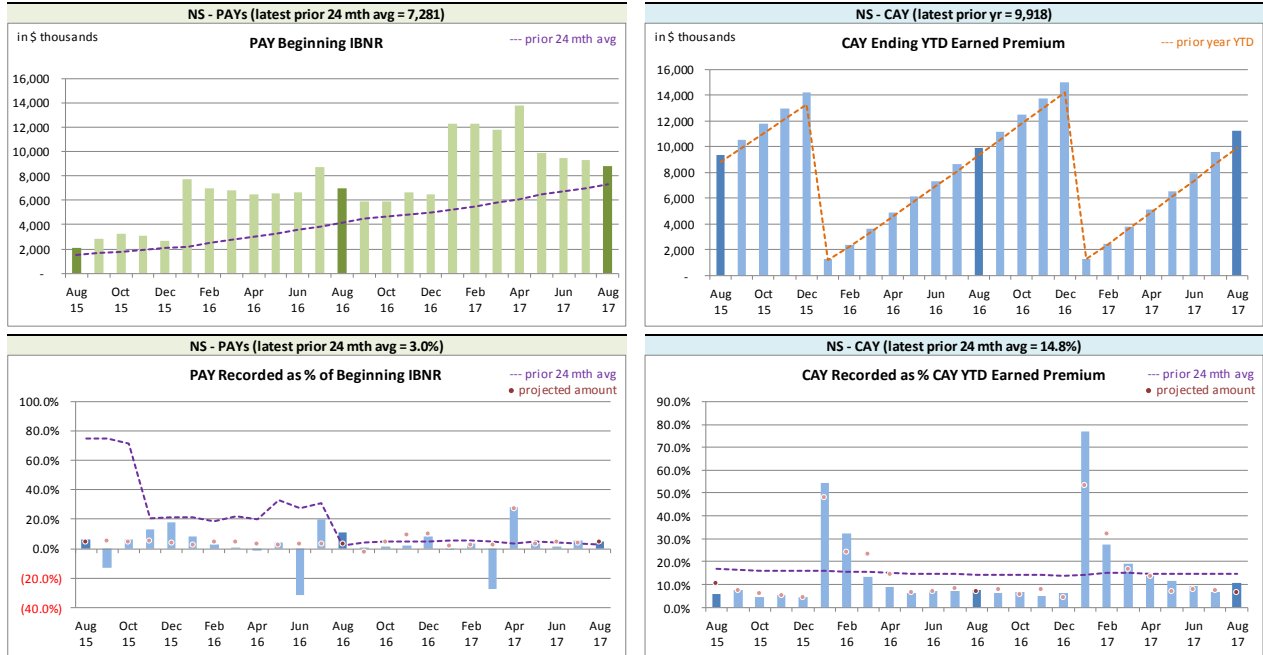
The CAYs **recorded** variance for the current month was outside the one standard deviation band. The activity was reviewed and confirmed, with the variance attributed to process variance.

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:

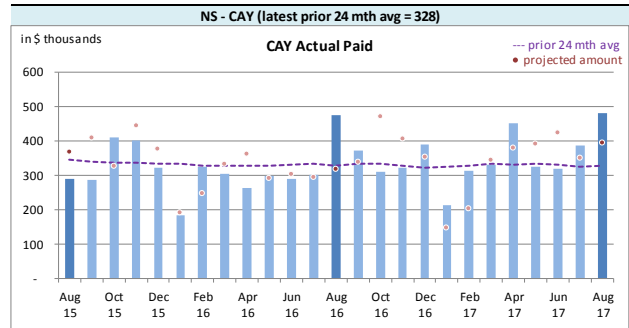
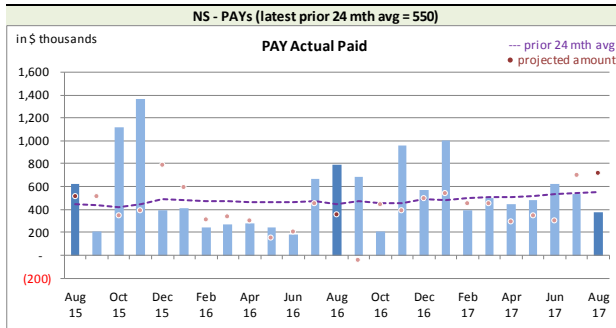
- to offset actual **recorded** activity (through loss ratio matching);
- the annual switchover as a current accident year becomes a prior accident year (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of prior accident years’ ultimate (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.

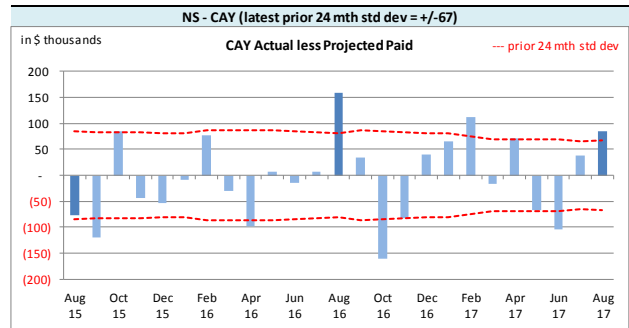
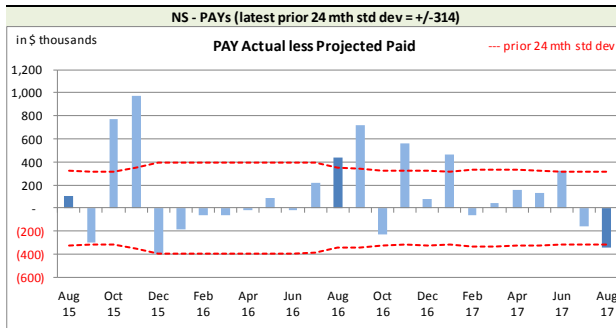
⁶Our recorded activity projections for the prior accident years are based on selected ratios of recorded activity to beginning unpaid balances, whereas the current accident year projections are based on selected ratios of year-to-date IBNR to year-to-date selected ultimate (i.e. selected LR x earned 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)		550	328
std dev		314	67
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.

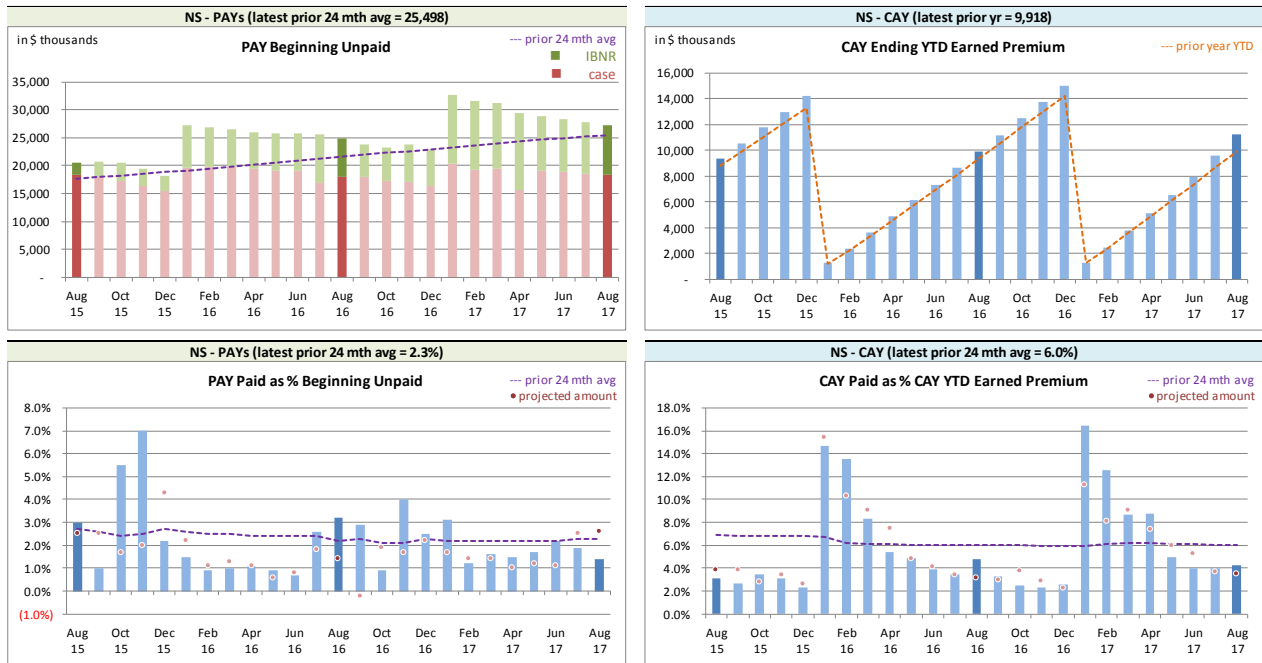
The PAYs **paid** variance for the current month was outside the one standard deviation band. The activity was reviewed and confirmed, with the variance attributed to process variance.

The current accident year (CAY) **paid** variances (see right chart above), do not appear to indicate bias. Toward the end of 2015 and the beginning of 2016, it seemed that bias may have been creeping into the projections (with actuals higher than the projections), however, corrective measures were taken and any potential bias seems to be gone. 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 CAYs **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 below 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

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.

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. The table immediately below summarizes variances in provisions included in the August 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	482	(741)	(294)	(56)	1,277	(153)	1,465	(950)
2015	2,243	(501)	(151)	(21)	683	(67)	2,775	(589)
2016	3,463	(939)	(250)	(23)	952	(115)	4,165	(1,077)
2017	3,905	(1,160)	(272)	(22)	927	(118)	4,560	(1,300)
TOTAL	10,093	(3,341)	(967)	(122)	3,839	(453)	12,965	(3,916)

The IBNR provision is \$3.3 million lower 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 August 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) before actuarial present value adjustments and in a premium deficiency position (shown as a positive value) 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 the valuation implementation.

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

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:	(758)	(680)	905	(206)	147	(886)
balance as % unearned premium:	(6.0%)	(5.4%)	7.2%	(1.1%)	1.2%	(6.5%)
actual unearned premium:	12,647					
less projected:	(699)					

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 93.5% rather than 92.1% (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	(3,617)	(32.6%)	(1,356)	(12.2%)	(4,973)	(44.8%)	(2,672)	(20.4%)
CAY	10,372	93.5%	655	5.9%	11,027	99.4%	1,041	(6.6%)
TOTAL	6,755	60.9%	(701)	(6.3%)	6,054	54.5%	(1,631)	(27.1%)

(“% 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 Jul. 2017	Actual Aug. 2017	Projected Sep. 2017	Projected Oct. 2017	Projected Dec. 2017
	2007		-	4	4	4	4
	2008		2	2	2	2	2
	2009		18	18	18	18	17
	2010		16	15	15	16	16
	2011		457	75	75	74	71
discount rate	2012		603	659	649	639	618
1.17%	2013		409	177	176	176	174
	2014		990	515	507	499	471
interest rate margin	2015		3,497	2,775	2,714	2,606	2,387
25 basis pts	2016		5,500	4,165	4,040	3,805	3,349
	2017		4,713	4,560	5,268	6,012	5,133
	TOTAL		16,205	12,965	13,468	13,851	12,242
	Change			(3,240)	503	383	

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 Jul. 2017	Actual Aug. 2017	Projected Sep. 2017	Projected Oct. 2017	Projected Dec. 2017
	54.3%	2007	(2)	1	1	1	1
	68.6%	2008	1	1	1	1	1
	64.2%	2009	7	7	7	7	7
	74.3%	2010	3	3	3	3	3
	91.0%	2011	330	(16)	(16)	(16)	(16)
	107.2%	2012	340	413	405	397	381
	88.4%	2013	(23)	(130)	(127)	(124)	(120)
	84.8%	2014	618	203	199	193	181
	78.6%	2015	2,858	2,243	2,198	2,110	1,925
	83.2%	2016	4,634	3,463	3,359	3,157	2,759
	92.1%	2017	4,047	3,905	4,512	5,143	4,116
		TOTAL	12,813	10,093	10,542	10,872	9,238
		Change		(2,720)	449	330	

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

EXHIBIT C

Premium Liabilities

TABLE EXHIBIT C

	Amounts in \$000s				
	Actual Jul. 2017	Actual Aug. 2017	Projected Sep. 2017	Projected Oct. 2017	Projected Dec. 2017
Premium Liabilities					
(1) unearned premium (UP)	11,318	12,647	15,225	16,896	17,413
FOR MEMBER SHARING					
(2) expected future costs ratio {% of (1)}	107.7%	101.2%	101.2%	101.2%	101.3%
(3) expected future costs {(1) x (2)}	12,187	12,794	15,409	17,105	17,640
(4) premium deficiency / (deferred policy acquisition cost)	869	147	184	209	227
Excluding Actuarial Present Value Adjustments					
(5) expected future costs ratio {% of (1)}	99.4%	94.0%	94.0%	94.1%	94.1%
(6) expected future costs {(1) x (5)}	11,245	11,889	14,317	15,895	16,392
(7) premium deficiency / (deferred policy acquisition cost)	(73)	(758)	(908)	(1,001)	(1,021)

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	development PfAD	Total apvs	TOTAL
2007	37	1	38	(1)	-	4	3	41
2008	12	1	13	-	-	1	1	14
2009	106	7	113	(1)	-	11	10	123
2010	133	3	136	(2)	1	14	13	149
2011	1,096	(16)	1,080	(24)	5	106	87	1,167
2012	2,715	381	3,096	(80)	15	302	237	3,333
2013	3,919	(120)	3,799	(99)	23	370	294	4,093
2014	2,701	181	2,882	(72)	14	348	290	3,172
2015	2,757	1,925	4,682	(131)	28	565	462	5,144
2016	3,597	2,759	6,356	(210)	44	756	590	6,946
PAYs (sub-total):	17,073	5,122	22,195	(620)	130	2,477	1,987	24,182
CAY (2017)	7,618	4,116	11,734	(422)	82	1,357	1,017	12,751
claims liabilities:	24,691	9,238	33,929	(1,042)	212	3,834	3,004	36,933
	Unearned Premium	Premium Deficiency / (DPAC)	Total Provision	discount	investment PfAD	development PfAD	Total apvs	TOTAL*
premium liabilities:	17,413	(1,021)	16,392	(515)	113	1,650	1,248	17,640
*Total may not be sum of parts, as apvs apply to future costs within UPR								
policy liabilities:			50,321	(1,557)	325	5,484	4,252	54,573

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 (Jun. 30, 2017)

Accident Year	Third Party Liability Margins	Accident Benefits Margins	Other Coverages Margins	Total 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%	9.8%	12.4%
2015	12.5%	10.0%	12.5%	12.4%
2016	12.5%	10.0%	12.5%	12.3%
2017	12.4%	10.0%	6.4%	12.0%
2018	12.1%	10.0%	5.1%	10.6%
prem liab	12.1%	10.0%	5.1%	10.6%

discount rate: 1.17%
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 current valuation selection (1.17%), the prior valuation assumption (0.93%) 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	0.67%	1.17%	1.67%	2.17%	2.67%	3.17%	0.93%	0.51%
2007	35	35	35	35	34	34	35	36
2008	8	8	8	8	8	8	8	9
2009	78	78	78	77	77	77	78	78
2010	123	122	121	121	120	119	123	124
2011	1,060	1,050	1,040	1,031	1,021	1,012	1,055	1,063
2012	3,317	3,279	3,243	3,207	3,172	3,138	3,297	3,329
2013	3,400	3,363	3,326	3,290	3,255	3,221	3,380	3,413
2014	3,140	3,107	3,074	3,042	3,011	2,981	3,123	3,151
2016	7,808	7,697	7,588	7,482	7,379	7,280	7,749	7,844
2017	13,890	13,673	13,461	13,253	13,053	12,861	13,776	13,962
Total	38,342	37,829	37,326	36,835	36,358	35,900	38,072	38,513
	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	curr + 200bp	prior val assumption	prior fyr end assumption

Dollar Impact Relative to Valuation Assumption								
AY	0.67%	1.17%	1.67%	2.17%	2.67%	3.17%	0.93%	0.51%
Total	513	-	(503)	(994)	(1,471)	(1,929)	243	684
	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	curr + 200bp	prior val assumption	prior fyr end assumption

Percentage Impact Relative to Valuation Assumption								
AY	0.67%	1.17%	1.67%	2.17%	2.67%	3.17%	0.93%	0.51%
2007	-	-	-	-	(2.9%)	(2.9%)	-	2.9%
2008	-	-	-	-	-	-	-	12.5%
2009	-	-	-	(1.3%)	(1.3%)	(1.3%)	-	-
2010	0.8%	-	(0.8%)	(0.8%)	(1.6%)	(2.5%)	0.8%	1.6%
2011	1.0%	-	(1.0%)	(1.8%)	(2.8%)	(3.6%)	0.5%	1.2%
2012	1.2%	-	(1.1%)	(2.2%)	(3.3%)	(4.3%)	0.5%	1.5%
2013	1.1%	-	(1.1%)	(2.2%)	(3.2%)	(4.2%)	0.5%	1.5%
2014	1.1%	-	(1.1%)	(2.1%)	(3.1%)	(4.1%)	0.5%	1.4%
2016	1.4%	-	(1.4%)	(2.8%)	(4.1%)	(5.4%)	0.7%	1.9%
2017	1.6%	-	(1.6%)	(3.1%)	(4.5%)	(5.9%)	0.8%	2.1%
Total	1.4%	-	(1.3%)	(2.6%)	(3.9%)	(5.1%)	0.6%	1.8%
	curr - 50 bp	curr val assumption	curr + 50bp	curr + 100bp	curr + 150bp	curr + 200bp	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	4	100.0%	4
2008	2	-	-	-	-	-	2
2009	18	-	-	-	-	-	18
2010	16	-	-	(1)	(1)	(6.3%)	15
2011	457	(8)	7	(381)	(382)	(83.6%)	75
2012	603	(11)	17	50	56	9.3%	659
2013	409	(13)	(13)	(206)	(232)	(56.7%)	177
2014	990	(48)	(115)	(312)	(475)	(48.0%)	515
2015	3,497	(133)	68	(657)	(722)	(20.6%)	2,775
2016	5,500	(258)	38	(1,115)	(1,335)	(24.3%)	4,165
2017	4,713	1,147	(582)	(718)	(153)	(3.2%)	4,560
Grand Total	16,205	676	(580)	(3,336)	(3,240)	(20.0%)	12,965

EXHIBIT G

Page 2 of 2

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

RSP Nova Scotia
AccountCode Desc IBNR - Undiscounted IBNR - in \$000s

AccYear	Values						
	Sum of Prior Month Actual Amount	Sum of Projected Change	Sum of Change Due to AvsP Variances	Sum of Change Due to Valuation Implementation	Sum of Total Change	Sum of % Total Change	Sum of Current Month Final Amount
2007	(2)	-	-	3	3	(150.0%)	1
2008	1	-	-	-	-	-	1
2009	7	-	-	-	-	-	7
2010	3	-	-	-	-	-	3
2011	330	(7)	6	(345)	(346)	(104.8%)	(16)
2012	340	(7)	14	66	73	21.5%	413
2013	(23)	-	(24)	(83)	(107)	465.2%	(130)
2014	618	(37)	(115)	(263)	(415)	(67.2%)	203
2015	2,858	(114)	60	(561)	(615)	(21.5%)	2,243
2016	4,634	(232)	27	(966)	(1,171)	(25.3%)	3,463
2017	4,047	1,018	(563)	(597)	(142)	(3.5%)	3,905
Grand Total	12,813	621	(595)	(2,746)	(2,720)	(21.2%)	10,093