



NOVA SCOTIA RISK SHARING POOL

JANUARY 2018 OPERATIONAL REPORT

ACTUARIAL HIGHLIGHTS

Related Bulletin: [F18-015 Nova Scotia RSP January 2018 Operational Report](#)

For your convenience, bookmarks have been added to this document. To view them, please click on the BOOKMARK tab at the left.

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

JANUARY 2018

TABLE OF CONTENTS

1	Summary.....	3
1.1	Valuation Schedule (Fiscal Year 2018).....	3
1.2	Appointed Actuary and Hybrid Actuarial Services Model.....	3
1.3	Consideration of Recent Legal Decisions and Changes in Legislation / Regulation	3
1.4	Current Provision Summary	4
2	Activity During the Month of January 2018	5
2.1	Recorded Premium and Claims Activity	5
2.1.a	Actual vs. Projected (AvsP): Earned Premium.....	6
2.1.b	AvsP: Recorded Indemnity & Allowed Claims Expense	7
2.1.c	AvsP: Paid Indemnity & Allowed Claims Expense	9
2.2	Actuarial Provisions.....	11
3	Ultimate Loss Ratio Matching Method.....	13
4	Calendar Year-to-Date Results.....	13
5	Current Operational Report – Additional Exhibits	14
6	EXHIBITS	14

1 Summary

1.1 Valuation Schedule (Fiscal Year 2018)

The January 2018 Operational Report leverages actuarial assumptions consistent with last month (that is, it does not reflect the results of an updated valuation). The table immediately below summarizes the implemented valuations and future scheduled valuations for fiscal year 2018.

NOVA SCOTIA RISK SHARING POOL FISCAL YEAR 2018 – SCHEDULE OF VALUATIONS			
Valuation Date	Discount Rate (per annum)	Operational Report	Description of Changes
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
Dec. 31, 2017		Mar. 2018	update valuation:
Mar. 31, 2018		May 2018	update valuation (roll forward):
Jun. 30, 2018		Aug. 2018	update valuation:
Sep. 30, 2018		Oct. 2018	update valuation (roll forward):

Under the proposed schedule for fiscal year 2018, the “off-half” valuation quarters ending March 31, 2018 and September 30, 2018 would not reflect a full valuation update of assumptions, but would rather “roll-forward” key assumptions from the previous valuation.

1.2 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.

1.3 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.

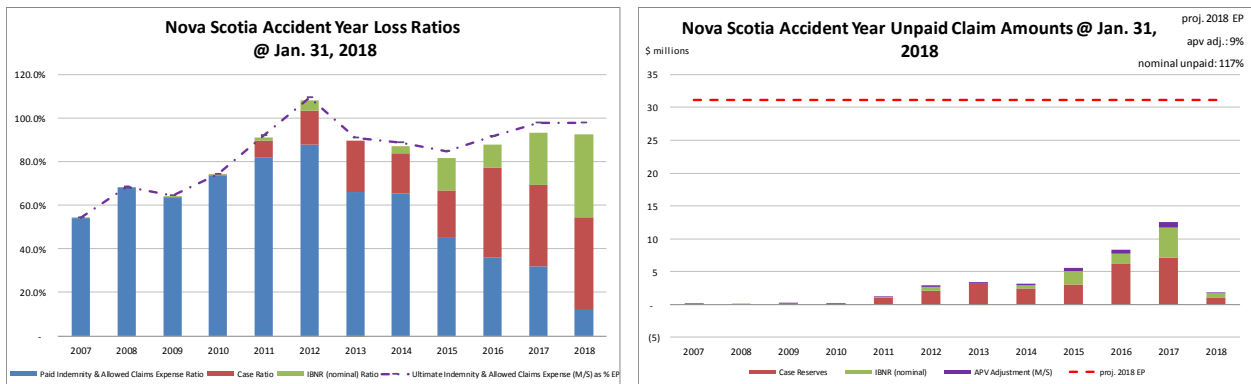
The **Supreme Court of Canada** rendered its judgment on **Saadati v Moorhead (2017 SCC 28, rendered on Jun 2, 2017)**. Saadati was involved in a collision in July of 2005 in British Columbia and sued the at-fault driver for damages. According to the Supreme Court decision, *“The trial judge found that 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.

1.4 Current Provision Summary

The charts immediately below show the current levels of claim liabilities¹ 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 2018 full year earned premium (the red hash-mark line) to provide some perspective.



The current actuarial present value adjustments balance (\$2.8 million – see table at the top of the next page) represents 9% of the earned premium projected for the full year 2018 (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

¹Claim 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.

operating result over future periods.

claim liabilities (\$000s)	amt	%
case	26,046	66.6%
ibnr	10,293	26.3%
M/S apv adjust.	2,761	7.1%
M/S total	39,100	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 53% of the IBNR balance relates to accident years 2017 and 2018 (see Exhibit B). Approximately 80% of the M/S

total claim liabilities are related to accident years 2014-2018 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)			policy liabilities (\$000s)		
	amt	%		amt	%
unearned prem	13,832	100.2%	claim	36,339	68.7%
prem def/(dpac)	(807)	(5.8%)	premium	13,025	24.6%
M/S apv adjust.	773	5.6%	M/S apv adjust.	3,534	6.7%
M/S total	13,798	100.0%	M/S total	52,898	100.0%

2 Activity During the Month of January 2018

2.1 Recorded Premium and Claims Activity

The table immediately below summarizes the extent to which premiums and claims amounts recorded during the month differ from projections reflected in the prior month's Operational Report².

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	-	-	344	189	(509)	(402)	(165)	(213)
2016	(0)	(0)	65	(13)	590	646	655	633
2017	(30)	(30)	501	11	274	495	774	505
2018	2,193	(33)	268	(61)	926	(143)	1,194	(204)
TOTAL	2,162	(63)	1,178	126	1,281	596	2,459	722

(Recorded transaction amounts exclude IBNR & other actuarial provisions)

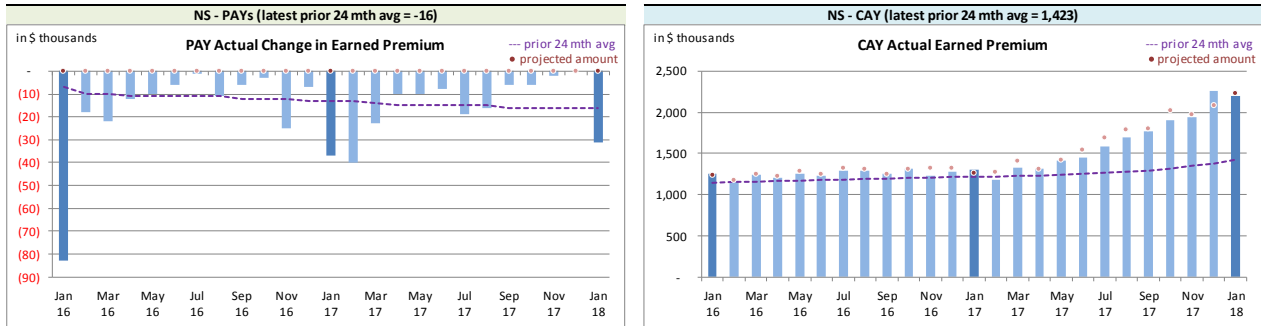
Claims transaction activity is generally volatile and changes from one month to the next are anticipated due to this natural "process variance" (i.e. random variation), and this is particularly true where volumes are low as found in this RSP. Each month, the projection variances are reviewed for signs 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.

²There may be rounding differences in values in this document compared with the associated Bulletin and/or Operational Report.

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

The charts immediately below show actual **earned premium**³ 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.

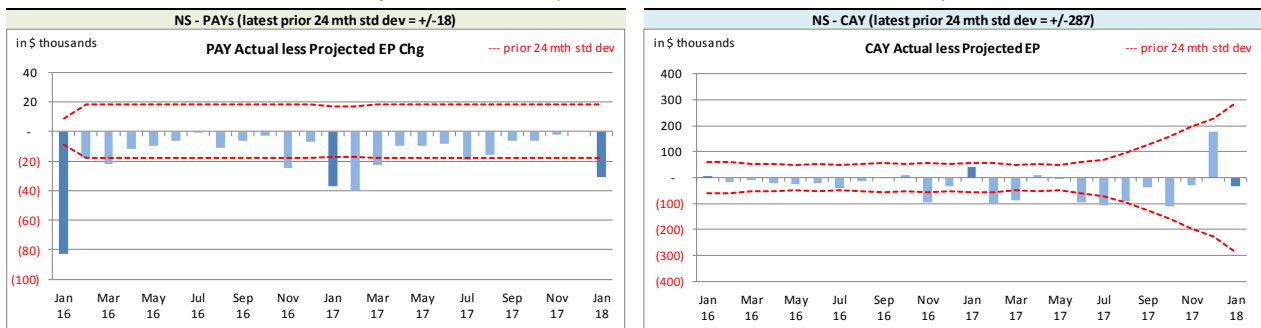
Nova Scotia RSP Actual Earned Premium by Calendar Month



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 immediately below. **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.

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)	1,423
std dev	18	287
A-P <> std dev	8	5
% <> std dev	32.0%	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) bias⁴, with actuals generally lower than projected.

³Premium 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.

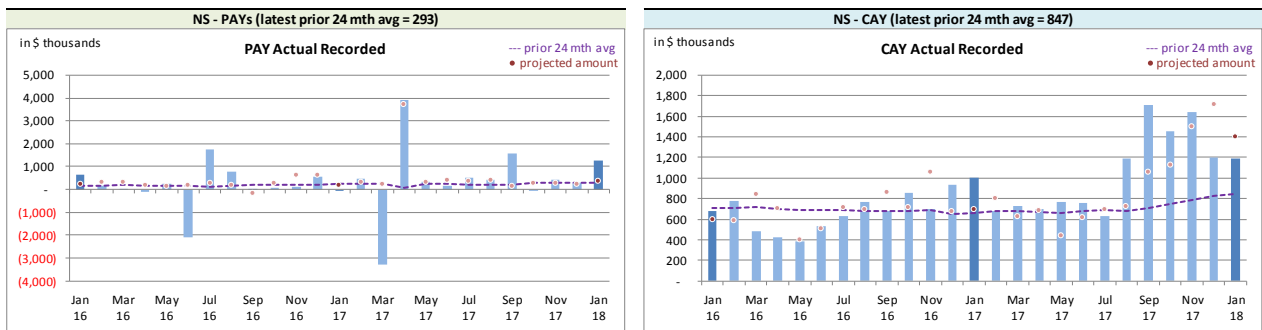
⁴The PAYS’ variances will show bias as the projection upload forces all earned premium projections to be attributed to the CAY.

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 bias⁵, with actuals being generally lower than projected, and we have modified our projections processes in response. 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. Notwithstanding the projection misses, readers will also note the significant widening of the CAY standard deviation band, reflecting the recent and sustained volume increases and the impact as those increases are earned.

2.1.b AvsP: Recorded Indemnity & Allowed Claims Expense

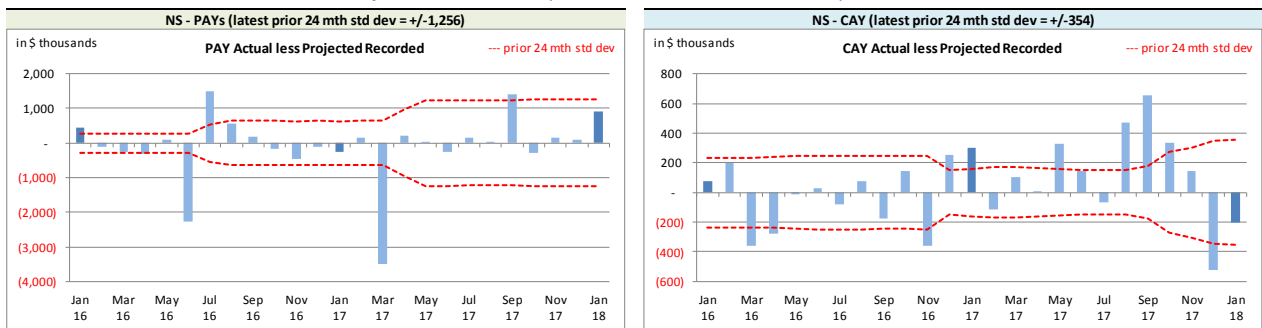
The charts immediately below show actual **recorded** activity (**paid** and case reserve changes), in each of the most recent 25 calendar months, along with a “prior 24-month average” to show how each month’s actual compares with the average amount of the preceding 24 calendar months.

Nova Scotia RSP Actual Recorded by Calendar Month



Recorded activity variances from the previous month’s projections are shown in the charts immediately 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



⁵We measure bias based on a 95% confidence range for a binominal distribution with trials based on the range being considered and 50% probability of success. The 24-month variances at January 2018 has only 5 months where the projection was higher than projected, and as the 95% confidence range is 7 to 17, bias continues to be indicated.

On Latest \$ thousands		
Recorded	PAYs	CAY
Mthly Avg Recorded (prior 24 mths)	293	847
std dev	1,256	354
A-P <> std dev	6	10
% <> std dev	24.0%	40.0%
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 at the bottom of the previous page), 24% of variances in excess of one standard deviation suggests the projection process has performed better than simply projecting based on a 24-month average. No bias has been indicated at a 95% confidence level on a lagging 24-month basis.

The current accident year (CAY) **recorded** variances (right chart at the bottom of the previous page) have resulted in 40% of the last 24 months generating variances in excess of a 24-month standard deviation, suggesting the projection process has performed worse than simply projecting based on a 24-month average. We are considering ways to improve our projection process as a result. No bias has been indicated at a 95% confidence level on a lagging 24-month basis.

FA management was notified on January 31, 2018 by a member of a potential recorded case reserve overstatement. Management investigated and estimated the overstatement for the Nova Scotia RSP as at October 31, 2017 as indicated in the table immediately below.

Estimated case reserve overstatement as at Oct 31, 2017

Case Reserve Overstatement
 400 RSP NS

	Amounts in \$000s
2012	36
2013	34
2014	42
2015	77
2016	578
2017	206
TOTAL	973

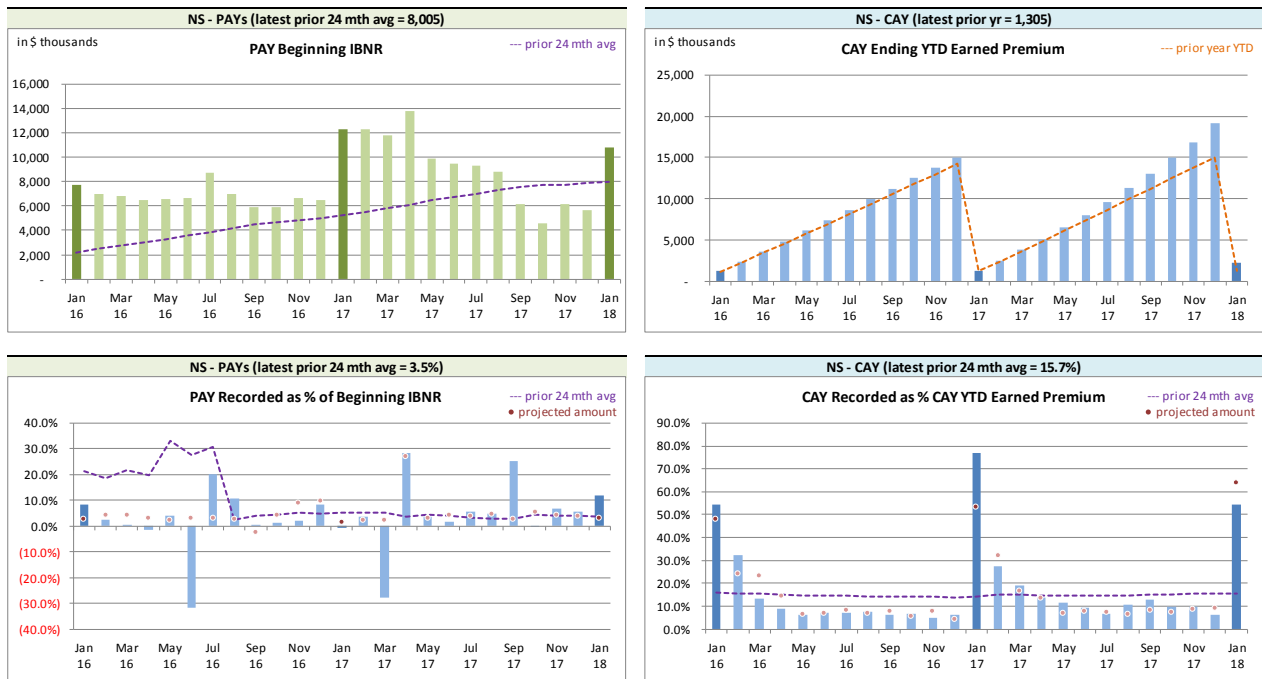
The overstatement of \$1.0 million represented 3.9% of total case reserves recorded at October 31, 2017 for the Nova Scotia RSP, and 2.8% of nominal claims liabilities.

FA’s year-end audited financial statements (as at October 31, 2017) were adjusted to reflect this overstatement by reducing the claims liabilities amount by the overstatement (as well as release of associated margins for adverse claims development). However, no adjustment has currently been made to reflect this in the Member Statements (i.e. monthly RSP Operational Reports). It is currently expected to be reflected via reductions in ultimate with the December 31, 2017 valuation, expected to be implemented into the March 2018 Operational Reports.

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 immediately below 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:

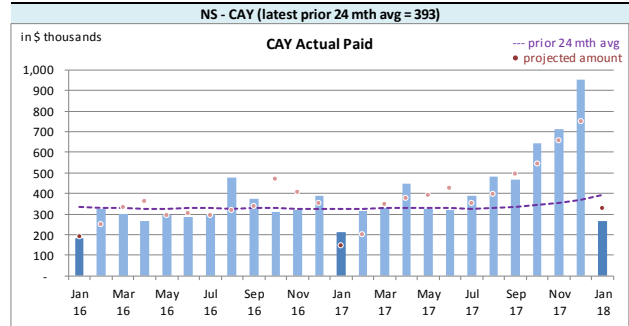
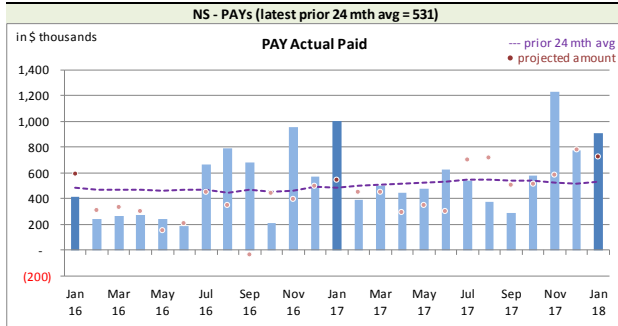
- to offset actual **recorded** activity (through loss ratio matching);
- the annual switchover as a current accident year becomes a prior accident year (occurs in January); and
- when a new valuation is implemented, where the valuation resulted in changes to the selection of prior accident years’ ultimate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

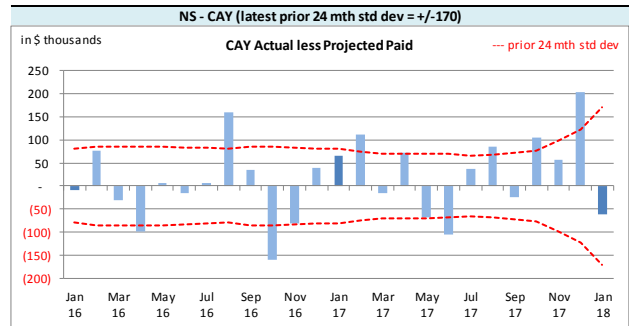
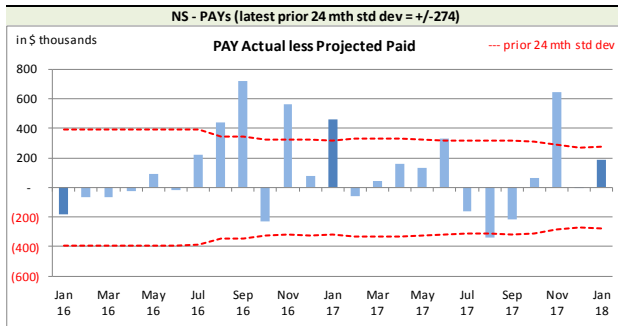
⁶Our recorded activity projections for the prior accident years are based on selected ratios of recorded activity to beginning unpaid balances, whereas the current accident year projections are based on selected ratios of year-to-date IBNR to year-to-date selected ultimate (i.e. selected LR x earned 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 immediately 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)		531	393
std dev		274	170
A-P <> std dev		7	9
% <> std dev		28.0%	36.0%
norm <> std dev		31.7%	31.7%

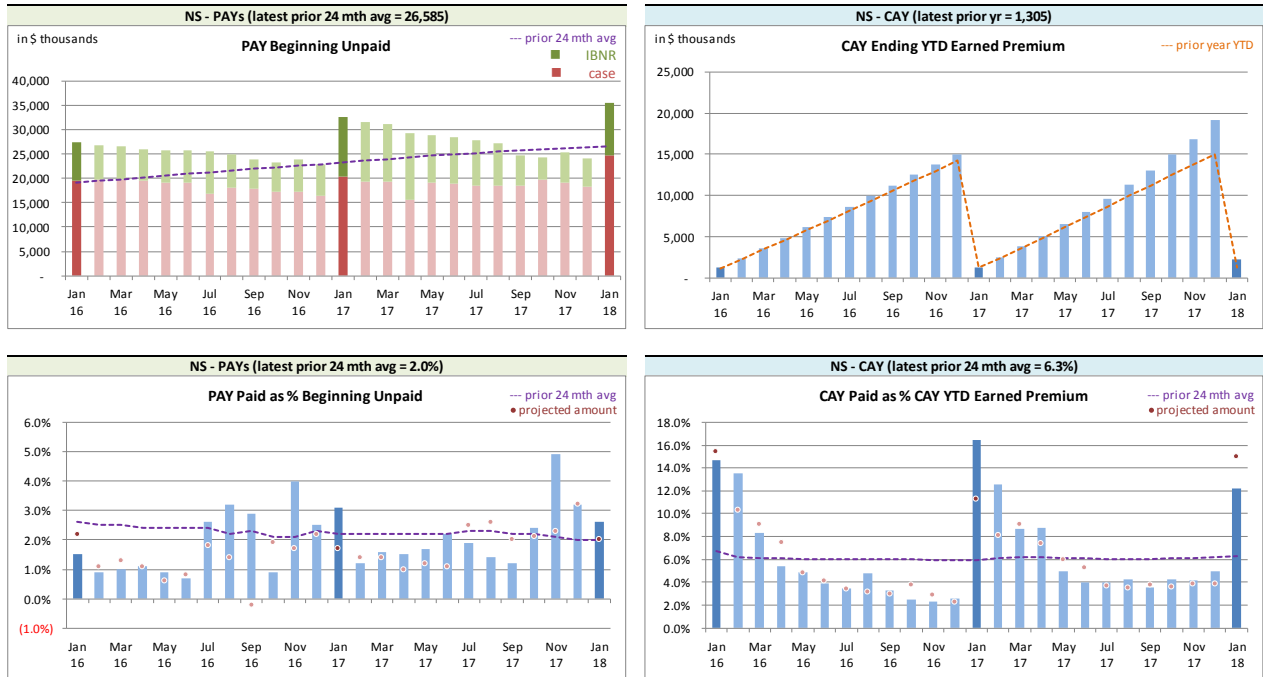
With respect to **paid** indemnity & allowed claims expense activity, caution must be exercised in reviewing the variances as this is a small pool and single claim transactions that are normal course for the business may look “unusual” and generate relatively “significant” variances that in nominal value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

28% of months with prior accident years (PAYs) **paid** variances were in excess of a prior 24-month standard deviation (see table above), suggesting the projection process has performed no better than simply projecting based on the previous 24-month average. No bias has been indicated at a 95% confidence level on a lagging 24-month basis.

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 has performed no better than simply projecting based on the previous 24-month average. No bias has been indicated at a 95% confidence level on a lagging 24-month basis.

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. The table at the top of the next page summarizes variances in provisions included in the

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”.

January 2018 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	3,355	212	(519)	8	1,714	(19)	4,550	201
2016	1,539	(633)	(323)	-	938	2	2,154	(631)
2017	4,567	(534)	(574)	2	1,408	(4)	5,401	(536)
2018	832	174	(93)	(1)	210	3	949	176
TOTAL	10,293	(781)	(1,509)	9	4,270	(18)	13,054	(790)

The IBNR provision is \$0.8 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.

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 January 2018 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 liability value as the adjustments increase the expected future policy obligations (costs) associated with the unearned premium. The variances noted are mainly driven by the unearned premium variance.

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:	(807)	8	773	(6)	(34)	2
balance as % unearned premium:	(5.8%)	-	5.6%	0.1%	(0.2%)	0.1%
actual unearned premium:	13,832					
less projected:	(110)					

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 93.7% rather than 92.4% (the valuation ultimate ratio for accident year 2018), 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	(29)	(1.4%)	90	4.2%	61	2.8%	#N/A	#N/A
CAY	2,026	93.7%	117	5.4%	2,143	99.1%	#N/A	#N/A
TOTAL	1,997	92.3%	207	9.6%	2,204	101.9%	#N/A	#N/A

(“% EP” based on 2018 calendar year-to-date earned premium; ratios may not total due to rounding)

In general, prior accident years (PAYs) changes from last month are due to the release of the actuarial present value adjustments with claims payments. 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.

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.

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 Dec. 2017	Actual Jan. 2018	Projected Feb. 2018	Projected Mar. 2018	Projected Dec. 2018
	2007	9	9	9	9	9
	2008	2	2	2	2	1
	2009	57	57	56	56	33
	2010	19	20	20	20	12
	2011	284	287	282	279	171
	2012	718	793	782	775	452
discount rate 1.73%	2013	138	185	180	179	165
	2014	607	656	649	643	408
interest rate margin 25 basis pts	2015	2,527	2,541	2,431	2,346	1,719
	2016	2,761	2,154	2,133	2,080	1,528
	2017	6,187	5,401	5,247	5,195	4,259
	2018	-	949	1,780	2,748	9,658
	TOTAL	13,309	13,054	13,571	14,332	18,415
	Change		(255)	517	761	

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 Dec. 2017	Actual Jan. 2018	Projected Feb. 2018	Projected Mar. 2018	Projected Dec. 2018
	54.3%	2007	8	8	8	8	8
	68.3%	2008	2	2	2	2	1
	64.1%	2009	47	47	47	47	25
	74.1%	2010	14	14	14	14	7
	91.1%	2011	201	201	199	197	96
	107.9%	2012	545	601	595	589	287
	89.2%	2013	(79)	(20)	(20)	(20)	(11)
	86.9%	2014	343	405	401	397	212
	81.6%	2015	2,110	2,097	1,992	1,912	1,334
	87.6%	2016	2,194	1,539	1,524	1,478	1,000
	93.2%	2017	5,370	4,567	4,430	4,386	3,543
	92.4%	2018	-	832	1,563	2,427	8,377
		TOTAL	10,755	10,293	10,755	11,437	14,879
		Change		(462)	462	682	

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

EXHIBIT C

Premium Liabilities

TABLE EXHIBIT C

	Amounts in \$000s				
	Actual Dec. 2017	Actual Jan. 2018	Projected Feb. 2018	Projected Mar. 2018	Projected Dec. 2018
Premium Liabilities					
(1) unearned premium (UP)	14,221	13,832	13,578	13,664	18,909
FOR MEMBER SHARING					
(2) expected future costs ratio {% of (1)}	99.7%	99.8%	99.8%	99.9%	102.4%
(3) expected future costs {(1) x (2)}	14,183	13,798	13,551	13,649	19,360
(4) premium deficiency / (deferred policy acquisition cost)	(38)	(34)	(27)	(15)	451
Excluding Actuarial Present Value Adjustments					
(5) expected future costs ratio {% of (1)}	94.2%	94.2%	94.2%	94.3%	96.6%
(6) expected future costs {(1) x (5)}	13,389	13,025	12,791	12,883	18,275
(7) premium deficiency / (deferred policy acquisition cost)	(832)	(807)	(787)	(781)	(634)

EXHIBIT D

Projected Year-end Policy Liabilities

The table below presents the projected policy liabilities as at December 31, 2018, broken down by component.

Nova Scotia ending 2018		Projected Balances as at Dec. 31, 2018 (\$000s)									
Acc Yr	nominal values			actuarial present value adjustments (apvs)						TOTAL	
	Case	IBNR	Total Unpaid	discount	investment PfAD	nominal development PfAD	development PfAD discount	development PfAD	Total apvs		
2007	-	8	8	-	-	1	-	1	1	9	
2008	1	1	2	-	-	-	-	-	-	2	
2009	75	25	100	(2)	-	10	-	10	8	108	
2010	52	7	59	(1)	-	6	-	6	5	64	
2011	883	96	979	(24)	3	98	(2)	96	75	1,054	
2012	2,001	287	2,288	(66)	9	229	(7)	222	165	2,453	
2013	2,750	(11)	2,739	(104)	16	274	(10)	264	176	2,915	
2014	2,032	212	2,244	(83)	11	278	(10)	268	196	2,440	
2015	3,113	1,334	4,447	(160)	22	543	(20)	523	385	4,832	
2016	5,615	1,000	6,615	(278)	40	800	(34)	766	528	7,143	
2017	6,525	3,543	10,068	(493)	70	1,198	(59)	1,139	716	10,784	
PAYs (sub-total):	23,047	6,502	29,549	(1,211)	171	3,437	(142)	3,295	2,255	31,804	
CAY (2018)	10,833	8,377	19,210	(1,018)	134	2,286	(121)	2,165	1,281	20,491	
claims liabilities:	33,880	14,879	48,759	(2,229)	305	5,723	(263)	5,460	3,536	52,295	
	Unearned Premium	Premium Deficiency / (DPAC)	Total Provision	discount	investment PfAD	nominal development PfAD	development PfAD discount	development PfAD	Total apvs	TOTAL*	
premium liabilities:	18,909	(634)	18,275	(790)	108	1,848	(81)	1,767	1,085	19,360	
policy liabilities:			67,034	(3,019)	413	7,571	(344)	7,227	4,621	71,655	

*Total may not be sum of parts, as apvs apply to future costs within UPR

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 to Dec. 31, 2018, and are based on more up-to-date information). We have included 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	9	-	-	-	-	-	9
2008	2	-	-	-	-	-	2
2009	57	(1)	1	-	-	-	57
2010	19	1	-	-	1	5.3%	20
2011	284	-	3	-	3	1.1%	287
2012	718	14	61	-	75	10.4%	793
2013	138	(1)	48	-	47	34.1%	185
2014	607	(28)	77	-	49	8.1%	656
2015	2,527	3	11	-	14	0.6%	2,541
2016	2,761	24	(631)	-	(607)	(22.0%)	2,154
2017	6,187	(250)	(536)	-	(786)	(12.7%)	5,401
2018	-	773	176	-	949	100.0%	949
Grand Total	13,309	535	(790)	-	(255)	(1.9%)	13,054

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 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	8	-	-	-	-	-	8
2008	2	-	-	-	-	-	2
2009	47	-	-	-	-	-	47
2010	14	-	-	-	-	-	14
2011	201	(2)	2	-	-	-	201
2012	545	(5)	61	-	56	10.3%	601
2013	(79)	1	58	-	59	(74.7%)	(20)
2014	343	(21)	83	-	62	18.1%	405
2015	2,110	(21)	8	-	(13)	(0.6%)	2,097
2016	2,194	(22)	(633)	-	(655)	(29.9%)	1,539
2017	5,370	(269)	(534)	-	(803)	(15.0%)	4,567
2018	-	658	174	-	832	100.0%	832
Grand Total	10,755	319	(781)	-	(462)	(4.3%)	10,293