TEXAS WINDSTORM INSURANCE ASSOCIATION
COMMERCIAL PROPERTY RATE LEVEL REVIEW
July 2, 2021

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INTRODUCTION

The Texas Windstorm Insurance Association (TWIA) has completed studies sufficient to support rate level indications for its commercial coverages. This report documents the procedures, methods, assumptions, data and results of this analysis.

DISTRIBUTION AND USE

This report was prepared for internal use by the management of TWIA and for the Board of Directors of TWIA. A complete copy of the report may be submitted to the Texas Department of Insurance (TDI or Department) for use in the approval of a rate change. Use of this report for other than the stated purpose may not be proper and must be preceded by written authorization.

RELIANCE UPON DATA

The following data and information used in this analysis were prepared by TWIA and are the responsibility of TWIA's management:

- TWIA losses and loss adjustment expenses
- TWIA written and earned premiums
- History of rate changes impacting TWIA commercial premium
- TWIA's statutory annual statements and insurance expense exhibits.

At the time of this analysis, some of the data was unaudited. The data was reviewed for reasonableness and consistency, and the TWIA written premium and paid loss data provided for this analysis were reconciled to TWIA's annual statements.

In addition to TWIA's own data, we utilized insurance industry premium and loss data supplied by the TDI.

We also used the results of two different hurricane simulation models -- one model developed by Applied Insurance Research (AIR) and the other model developed by Risk Management Solutions (RMS). Both models utilized TWIA exposure data as of 11/30/2020. TWIA has not directly verified the accuracy of these simulation models, but has relied on documentation provided directly by the modeling firms and submission documentation provided to the Florida Commission on Hurricane Loss Projection Methodology to comply with Actuarial Standard of Practice #38, "Using Models Outside the Actuary's Area of Expertise."

LIMITATIONS

The indicated rate level change as shown in this report represents a reasonable estimate of the rate level necessary to cover the TWIA's expected costs of providing commercial wind/hail coverage. The actual costs of providing commercial property coverage for a specific year may differ substantially from the indicated rate level range shown in this report. The possibility of this variability arises from the fact that the events covered by TWIA are inherently unpredictable from year to year. The indicated rate level is, however, our best estimate of the expected average annual cost of providing commercial wind/hail coverage.

This actuarial report provides professional insights and guidance to TWIA regarding TWIA's rate levels; however, the final decision regarding implementation and actual rate level change is a Board decision subject to the approval requirements of the Texas Department of Insurance.

The attached exhibits should be considered an integral part of this report.

EXECUTIVE SUMMARY

This section provides a brief summary of the key findings contained in our study.

1. We have estimated the indicated total rate level change using a combination of two different methodologies for projecting the expected average annual hurricane loss portion of the indicated rate level. The indicated total rate level changes are shown in Exhibit 1 and the following table:

Indicated Rate Change: Long Term Hurricane Methodologies

Hurricane Projection Methodology	Indicated Rate Change
Actual Experience and Models Combined	+46%
Actual Industry Experience	+38%
AIR Hurricane Simulation Models	+60%
RMS Hurricane Simulation Models	+48%

The indicated rate change shown is based on a combination of actual industry experience and hurricane simulation models. The indications based on each of these methodologies alone are also shown for reference. All methodologies rely on a long-term view of event frequency to develop the hurricane portion of the indicated rate level.

The hurricane simulation models utilized are widely used for catastrophe risk management and insurance ratemaking by the insurance industry. Versions of these simulation models have undergone verification and been approved by the Florida Commission on Hurricane Loss Projection Methodology.

2. The differences in indicated rate level changes reflect different hurricane loss projection methodologies. The different methods were used because the actuarial methods used to project hurricane losses in rate indications are still evolving. Traditionally, actuarial methods had been based on insurance industry hurricane loss experience. This traditional method is well recognized as having its limits. For instance, historical results are not representative of future events in many areas, given that exposures change over time (i.e. property values, population movement, building codes and construction techniques,

topography, etc.). Furthermore, on-leveling historical hurricane losses and premiums is very challenging due to lack of historical data. In recent decades after Hurricane Andrew, actuarial methods have incorporated the results of hurricane simulation models to minimize the weaknesses of the traditional approaches.

The method relying on actual industry hurricane experience is more of a traditional approach. Specifically, hurricane severity is calculated from 55 years of actual insurance industry premium and loss data, and hurricane frequency is based on 169 years of actual hurricane experience along Texas coastal lines. Severe hurricanes are so relatively infrequent that this limited number of years of actual industry experience may not represent the scope of potential occurrences. Also, the distribution of insured properties has changed dramatically over time with the increased population and building values along the Gulf Coast. The alternative method incorporates the results of hurricane simulation models and has the advantage of minimizing many of the theoretical weaknesses of the traditional actuarial methodologies. The overall indication assigns equal weight to both traditional hurricane projection methodology and simulation model-based hurricane projection methodology.

3. The current rate indication is 3% less than the corresponding indication from the prior TWIA commercial rate study.

   Details on the key differences between the current and prior rate indications are described in the Analysis section of this report.

4. The indicated rate changes presented in this report reflect a separate provision for contributions to funding and uncertainties in pricing hurricanes. The total funding and contingency provision is assumed to be equal to 5% of TWIA premium.

   The provision for debt service of 18.6% represents the projected cost of debt service on the Series 2014 Class 1 Pre-Event Bonds. As of June 30, 2018, the available proceeds of the Series 2014 Pre-event Class 1 securities were used to pay claims associated with Hurricanes Harvey.

The provision for reinsurance expense is 19.7% of TWIA premium. The provision for reinsurance expense reflects the estimated actual net cost of purchasing catastrophe reinsurance (reinsurance premiums paid net of the expected reduction in TWIA retained losses). Catastrophe reinsurance provides TWIA with annually renewable protection against large storm losses.

ACTUARIAL ANALYSIS

Overview of Analysis

The goal of the rate level adequacy review is to compare the current rate level to TWIA's expected costs for providing commercial property insurance coverage. This comparison is achieved by estimating the projected loss, loss adjustment expense (LAE), and fixed expense ratio for a prospective accident year and then comparing this ratio to the "permissible" loss, LAE, and fixed expense ratio. The permissible ratio is the portion of premium remaining to pay loss, LAE, and fixed expenses after payment of TWIA variable expenses. If the projected ratio is higher than the permissible ratio, then a rate increase is indicated. If the projected ratio is lower than the permissible, then a rate decrease is indicated.

The steps employed to estimate the projected loss, LAE, and fixed expense ratio are as follows:

1. Adjust historical premium to the current rate level (to facilitate calculation of historical loss ratios at current rates).
2. Determine LAE factors to add projected LAE to projected loss.
3. Estimate the projected non-hurricane loss and LAE ratio.
4. Estimate the projected hurricane loss and LAE ratio.
5. Estimate the projected fixed expense ratio.
6. Sum the projected non-hurricane and hurricane loss ratios and the projected fixed expense ratio to obtain the projected total loss, LAE, and fixed expense ratio.

The steps employed to determine the permissible loss and LAE ratio are as follows:

(a) Analyze historical variable expense to premium ratios to estimate the projected total variable expense ratio.
(b) Subtract the projected total variable expense ratio from 1.00 to derive the permissible loss, LAE and fixed expense ratio.

Steps 1-5 and (a)-(b) are described in more detail in the remainder of this report.

Earned Premium at Current Rates

Historical TWIA written premium is adjusted to the current rate level and adjusted to an earned basis based on a uniform monthly earning assumption. Earned premium at current rates for prior years permits the calculation of historical loss ratios at the current rate level. Exhibit 10 shows the calculation of earned premium at current rates.

Loss Adjustment Expense Factors

In Exhibit 4, the historical ratio of LAE to loss is analyzed to develop LAE factors. Separate LAE factors are developed for hurricane and non-hurricane losses. The hurricane LAE factors are developed based on the LAE to loss ratio for years with hurricanes. The non-hurricane LAE factors are developed based on the ratio for years without hurricanes. TWIA statutory annual statement incurred loss and LAE data is utilized to derive these ratios.

The indicated LAE to loss ratios are shown in Exhibit 4, Sheet 1. For hurricane losses, the indicated LAE ratio of 0.154 is equal to the weighted average of the 10 hurricane years included in the analysis. For non-hurricane losses, the indicated ratio of 0.278 is equal to the weighted average of the most recent 10 non-hurricane years included in the analysis.

The development of these LAE factors is necessary to add LAE to the projected hurricane and non-hurricane loss ratios. The development of loss ratios is described in the following sections.

Projected Non-Hurricane Loss and LAE Ratio

Exhibit 2 shows the development of the projected non-hurricane loss and LAE ratio. The loss portion of this ratio is estimated by comparing the indicated ultimate non-hurricane loss for accident years 2011 - 2020 to the earned premium at current rates for the same ten years. The indicated ultimate non-hurricane loss for each year is based on actual paid loss as of 12/31/2020 and the paid loss development method. LAE is then added to each year's ultimate loss through the non-hurricane LAE factor developed in Exhibit 4.

Paid loss development factors are selected based on both the average of all available years and the prior selection. Given the positive skewness of the observed age-to-age development factors, a straight average is more appropriate than an average that excludes the highest and lowest observation to avoid understating the expected development.

Each year's estimated ultimate loss and LAE is compared to the earned premium at present rates.

The resulting loss and LAE ratios are then trended forward based on the expected prospective inflation level. The net trend factor is equal to a loss trend offset by a premium trend. The loss trend is calculated using industry-wide construction cost and consumer price indices. The premium trend is derived from historical changes in average written premium at present rates. Both premiums and losses are trended to current levels by applying the actual historical changes in the appropriate data. Future premium and loss trends are selected based on all available and relevant data. The selected trends are estimates of the future trend between the current and prospective earned and accident dates, and they are not used to trend historical experience to current premium and loss levels.

The indicated loss and LAE ratio is the premium-weighted average loss ratio from the 2011 - 2020 accident period. Given the great variability among individual accident years, a premium weighted average across the most recent 10 years has been selected to achieve both high stability and credibility.

Projected Hurricane Loss and LAE Ratio

Two different methods are used to develop the projected hurricane loss and LAE ratios. The first method is based on insurance industry experience from the recent 51 years and meteorological hurricane experience from the recent 170 years. The other method is based on hurricane simulation models. The "51/170-year" method is utilized because the Texas Insurance Code requires the consideration of a 30-year minimum experience period. The simulation method is utilized because it minimizes many of the weaknesses of the traditional method. These weaknesses include:

- A 51-year period is insufficient to measure long-term hurricane frequency.
- A 51-year period of insurance industry experience includes years where land use, population densities, construction techniques and materials, engineering techniques and building codes were different than today. These differences diminish the relevance of insurance data from several decades ago in evaluating today's commercial property rates.

Differences between the two methods are the result of expected variances in the frequency and severity of hurricanes, and fundamental differences between the historical industry exposures and current TWIA exposures. Because of the readily identifiable nature of hurricanes, there should be no double-counting or understatement of expected future losses resulting from the use of either method.

For each of the two methods mentioned above, the projected hurricane loss ratio is estimated first. LAE is added to loss ratio using the hurricane LAE factor developed in Exhibit 4. Development of the projected hurricane loss ratio for the two methods is described as follows:

Actual 51/170-Year Industry Hurricane Experience

In Exhibit 6, the reported Texas insurance industry seacoast dwelling extended coverage premium and loss experience for the period 1966 through 2020 is used in the development of a projected hurricane loss ratio. Insurance industry loss ratios at current rates are calculated using information provided by the TDI. For the years where sufficient detail is available (1983 - 2020), these loss ratios are adjusted to TWIA's rate level.

A projected hurricane loss ratio is developed from these 51 years of loss ratios by separating the 51 years into the 13 hurricane years and 38 non-hurricane years. The 38 non-hurricane years are used to develop an estimated non-hurricane loss ratio.

Hurricane loss ratios are then estimated by subtracting the non-hurricane loss ratio from the total loss ratio in each of the thirteen hurricane years. An average per-hurricane loss ratio for hurricane years is calculated as the average of the 15 hurricane loss ratios: 113.7%.

The 51-year period that underlies the selected hurricane loss ratio has experienced significantly fewer hurricanes than the long-term average. As shown in Exhibit 9, the annual hurricane frequency during this 51-year period is 0.333, while the annual frequency during the most recent 170-year period is 0.394. The 51-year period represents all years for which TWIA has been provided industry data by TDI. Because the expected frequency of hurricanes is unrelated to the availability of insurance industry data, there is no reason to use only the most recent 51-year period to estimate the expected frequency of hurricane activity. Given the relatively infrequent occurrence of hurricanes, the largest possible experience period should be considered for hurricane frequency in order to obtain the most credible result. The selected hurricane frequency is therefore set equal to the 170-year historical hurricane frequency. As shown in Exhibit 6, Sheet 1, multiplying the selected loss ratio for hurricane years by the selected hurricane frequency yields a projected hurricane loss ratio of 44.8%.

Hurricane Simulation Models

The projected hurricane loss ratio is determined by averaging two different hurricane simulation

models. The model versions utilized are AIR Touchstone v8 and RMS RiskLink v18.1. Both models were run using exposure data provided by TWIA as of 11/30/2020. This exposure data included location-level detail, with physical characteristics of each risk, and all relevant coverages. Both models were run using historical (long-term) event rates and both results include loss amplification (demand surge) and exclude storm surge and loss adjustment expenses. The AIR and RMS models generated 4,751 and 9,774 unique events, respectively, with the following distribution of intensity ratings:

Saffir-Simpson Category	AIR	RMS
Category 0	12.8%	45.2%
Category 1	36.3%	17.0%
Category 2	22.9%	13.1%
Category 3	19.0%	13.9%
Category 4	8.3%	9.9%
Category 5	0.8%	0.8%

Events shown as Category 0 include events with no U.S. landfall, Category 0 events making landfall or bypass in TX, and events making landfall or bypass in neighboring states or Mexico.

As shown in Exhibits 7 and 8, these models yield projected hurricane loss ratios of 60.1% and 52.8%. The average of these loss ratios is 56.5%.

Fixed Expenses and Variable Permissible Loss and LAE Ratio

Exhibit 11 shows the expense assumptions used to develop the projected fixed expense ratio and the variable permissible loss and LAE ratio. Fixed expenses include general expenses, Class 1 public security interest and principal repayment and the net cost of reinsurance (after modeled recoveries). The sum of these projected expenses provides for a 46.4% fixed expense ratio. Variable expenses include commission, taxes, and projected contributions to the Catastrophe Reserve Trust Fund (CRTF). Subtracting these expenses from 100% yields a permissible loss and LAE ratio of 77.1%.

As stated above, the expenses include a provision for an annual contribution to the CRTF,

repayment of Class 1 public securities, and the projected net cost of TWIA's purchasing of reinsurance. The 19.7% provision for reinsurance expense reflects the estimated net actual cost of purchasing reinsurance (reinsurance premiums net of the expected reduction in TWIA retained losses). TWIA's purchasing of reinsurance provides additional current year protection to TWIA, coastal policyholders and TWIA insurance members. Furthermore, TWIA's purchasing of reinsurance helps TWIA fulfills its statutory funding obligations.

Indicated Rate Change

Exhibit 1 summarizes the indicated rate change using a combination of the two hurricane loss ratio projection methods. The individual indications resulting from the use of each methodology are also shown for reference. The indicated rate change for each method is calculated by dividing the total projected loss, LAE, and fixed expense ratio by the variable permissible loss and LAE ratio. This method of calculating the indicated rate change assumes that TWIA's variable expenses vary proportionally with premium while the fixed expenses do not.

Data Issues

Reconciliation of Data to TWIA's Annual Statements

Exhibit 12, Sheets 1 and 2 show a reconciliation of the TWIA premium and loss data used in this report (ratemaking data) to TWIA's annual statements. Sheet 1 reconciles paid loss data by accident year; Sheet 2 reconciles written premium data by calendar year.

Differences between the ratemaking paid loss data and the annual statement data for all accident years were reviewed, considered explainable and therefore deemed not significant.

The written premium reconciliation shows the differences between the ratemaking written premium data and the annual statement data for calendar years 1994 - 2020. Differences of less than 1% exist for all recent years except 2010.

Key Differences Versus Prior Indications

The indicated rate change shown in this report is 3% less than the comparable indication based on the prior (July 2020) study. The reasons for lower indications are summarized in the following table.

Reconciliation of Current vs. Prior Indications

Rate Indication/Reason for Change	Impact of Change	Rate Indication
Previous Rate Indication (Combined Method)		**+49%**
Change in modeled loss ratio	+2%	
Change in class I bond repayment	-2%	
Change in industry hurricane loss ratio	-2%	
Change in all other factors	-1%	
Current Rate Indication (Combined Method)		**+46%**

Noteworthy changes compared to prior analysis are discussed below:

Changes in modeled hurricane loss ratios and industry experience hurricane loss ratios
The average of the two modeled hurricane loss ratios increased by 3.1%, which is largely offset by a decrease of 2.6% in industry experience hurricane loss ratio.

The increase of 3.1% in modeled hurricane loss ratios reflects both hurricane model version changes and TWIA exposure changes observed in the coastal area. Since December 2016, TWIA commercial policies decreased to 6,405 from 10,285 in March 2021. By its statutory design, as a residual market insurer, TWIA is unavoidably subject to adverse selections. The cumulative impact (+10%, commercial and residential combined) of the adverse selection starting from 2015 is expected to be fully reflected in TWIA modeled hurricane loss ratios, but not in industry experience-based loss ratios.

Changes in outstanding bond repayment provision, reinsurance provision and general expense provision
The outstanding class 1 public securities were issued in 2014 and had been depleted from paying for claims associated with Hurricane Harvey. Due to a recent bond redemption in 2020, TWIA's revised annual principal and interest payment is about $69 million, resulting in a provision of 18.6%. Meanwhile, reinsurance provision increased slightly to 19.7% from 19.5%, and general expense provision decreased to 8.1% from 8.5%. Collectively those three provisions add up to a fixed expense provision of 46.4%, which is 1.4% less compared to 2020 rate analysis.

SUMMARY OF EXHIBITS

Exhibit Number	Exhibit Title or Purpose
1	Summary of Indicated Rate Change
2	Projected Ultimate Non-Hurricane Loss & LAE Ratio
3	Paid Loss Development Factors and Premium and Loss Trend Analysis
4	Development of LAE Factor
5	Summary of Indicated Hurricane Loss & LAE Ratios
6	Development of Hurricane Loss Ratio – 51/170-Year Method
7	Hurricane Loss Ratio – AIR Model
8	Hurricane Loss Ratio – RMS Model
9	Texas Hurricanes 1850 - 2020
10	Earned Premium at Present Rates
11	Fixed Expenses and Variable Permissible Loss & LAE Ratios
12	Reconciliation of Premium Data to Annual Statement

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
2021 Rate Level Review

Texas Windstorm Insurance Association
Commerial Property - Wind & Hail
Rate Level Review

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Texas Windstorm Insurance Association Exhibit 1
Commercial Property - Wind & Hail
Rate Level Review
Summary of Indicated Rate Change
By Method for Projecting Hurricane Loss & LAE

	Indicated Loss & LAE Ratio					
Hurricane Projection Method	Hurricane	Non-Hurricane	Fixed Expenses	Total	Permissible LLAE Ratio	Indicated Rate Change
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Using Experience and Models	58.1%	8.1%	46.4%	112.5%	77.1%	46.0%
Using Actual Industry Experience	51.7%	8.1%	46.4%	106.2%	77.1%	+38%
Using AIR Models	69.0%	8.1%	46.4%	123.5%	77.1%	+60%
Using RMS Models	59.8%	8.1%	46.4%	114.3%	77.1%	+48%
Average of AIR and RMS Models	64.4%	8.1%	46.4%	118.9%	77.1%	54%

Notes:
(2) Exhibit 5
(3) Exhibit 2, Sheet 1
(4) Exhibit 11
(5) = (2) + (3) + (4)
(6) Exhibit 11
(7) = (5) / (6) - 1
Selected

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Projected Ultimate Non-Hurricane Loss & LAE Ratio

Accident Year	Ultimate Non-Hurricane Loss	LAE Factor	Net Trend Factor	Projected Non-Hurricane Loss & LAE	Earned Premium at Current Rate Level	Indicated Non-Hurricane Loss & LAE Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2011	19,217,587	0.278	0.996	24,461,836	138,891,291	17.6%
2012	14,459,642	0.278	0.982	18,146,793	137,525,969	13.2%
2013	7,351,329	0.278	1.001	9,404,393	139,160,577	6.8%
2014	1,056,281	0.278	0.979	1,321,579	129,234,128	1.0%
2015	18,728,914	0.278	0.961	23,002,066	114,980,596	20.0%
2016	2,651,031	0.278	0.957	3,242,333	100,738,792	3.2%
2017	2,049,203	0.278	0.935	2,448,654	83,489,580	2.9%
2018	249,610	0.278	0.897	286,144	69,991,684	0.4%
2019	1,000,525	0.278	0.923	1,180,213	62,410,281	1.9%
2020	540,154	0.278	0.984	679,272	59,725,391	1.1%
Total	67,304,276			84,173,283	1,036,148,289	8.1%

Notes:

(2) Exhibit 2, Sheet 2
(3) Exhibit 4, Sheet 1
(4) = Exhibit 2, Sheet 4
(5) = (2) * [1 + (3)] * (4)
(6) Exhibit 10, Sheet 1
(7) = (5) / (6)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Projected Ultimate Non-Hurricane Loss

Accident Year	TWIA Non-Hurricane Paid Loss	Development Factor	Ultimate Non-Hurricane Loss
(1)	(2)	(3)	(4)
2011	19,217,587	1.000	19,217,587
2012	14,459,642	1.000	14,459,642
2013	7,351,329	1.000	7,351,329
2014	1,056,281	1.000	1,056,281
2015	18,672,896	1.003	18,728,914
2016	2,596,505	1.021	2,651,031
2017	1,999,222	1.025	2,049,203
2018	237,951	1.049	249,610
2019	874,585	1.144	1,000,525
2020	393,411	1.373	540,154
Total	66,859,407		67,304,276

Notes:
(2) Exhibit 2, Sheet 3, as of 12/31/20
(3) Exhibit 3, Sheet 1
(4) = (2) * (3)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Summary of TWIA Historical Paid Loss as of 12/31/20

Accident Year	Paid Loss Excluding Expense Non-Hurricane	Hurricane	Total
(1)	(2)	(3)	(4)
2011	19,217,587	0	19,217,587
2012	14,459,642	0	14,459,642
2013	7,351,329	0	7,351,329
2014	1,056,281	0	1,056,281
2015	18,672,896	0	18,672,896
2016	2,596,505	0	2,596,505
2017	1,999,222	455,096,643	457,095,865
2018	237,951	0	237,951
2019	874,585	0	874,585
2020	393,411	4,314,869	4,708,280
Total	66,859,407	459,411,513	526,270,920

Notes:
(2), (3) Provided by TWIA, includes commercial and farm
(4) = (2) + (3)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Calculation of Net Trend Factors

Year / Quarter	Average Writen premium Per house year At present rates
(1)	(2)
2011 / 4	4,002.39
2012 / 4	4,097.53
2013 / 4	4,252.75
2014 / 4	4,282.15
2015 / 4	4,264.40
2016 / 4	4,252.60
2017 / 4	4,215.24
2018 / 4	4,176.71
2019 / 4	4,382.63
2020 / 4	4,696.04

(3)	Current Average Earned Date	7/1/2020
(4)	Current Average Accident Date	7/1/2020
(5)	Prospective Average Earned / Accident Date	1/1/2023
(6)	Premium Trend Length	2.500
(7)	Loss Trend Length	2.500
(8)	Selected Premium Trend	2.5%
(9)	Selected Loss Trend	1.9%

Accident Year	Current Premium Trend	Current Loss Trend	Prospective Premium Trend	Prospective Loss Trend	Net Trend Factor
(10)	(11)	(12)	(13)	(14)	(15)
2011	1.173	1.187	1.065	1.048	0.996
2012	1.146	1.143	1.065	1.048	0.982
2013	1.104	1.123	1.065	1.048	1.001
2014	1.097	1.091	1.065	1.048	0.979
2015	1.101	1.075	1.065	1.048	0.961
2016	1.104	1.074	1.065	1.048	0.957
2017	1.114	1.058	1.065	1.048	0.935
2018	1.124	1.024	1.065	1.048	0.897
2019	1.072	1.005	1.065	1.048	0.923
2020	1.000	1.000	1.065	1.048	0.984

Notes:

(2) Exhibit 3, Sheet 2 (7)
(3) Latest Year / Quarter Ending Date - 6 Months
(4) Latest Accident Year Ending Date - 6 Months
(5) Rate Effective Date + 12 Months
(6) = (5) - (3)
(7) = (5) - (4)
(8) Exhibit 3, Sheet 2
(9) Exhibit 3, Sheet 3a
(11) = (2) Indexed to 2020 / 4
(12) Exhibit 3, Sheet 3a
(13) = [1 + (8)] ^ (6)
(14) = [1 + (9)] ^ (7)
(15) = [(12) * (14)] / [(11) * (13)]

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Paid Loss Development Factors
TWIA Commercial Property Paid Loss

Months of Development

Accident Year	12	24	36	48	60	72	84
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2011	13,360	16,138	18,435	18,758	19,119	19,200	19,218
2012	8,512	11,404	13,135	13,284	13,309	14,460	14,460
2013	6,886	7,243	7,338	7,351	7,351	7,351	7,351
2014	641	875	1,015	1,056	1,056	1,056	1,056
2015	15,923	17,690	17,780	18,644	18,644	18,673	
2016	2,055	2,479	2,584	2,597	2,597		
2017	1,599	1,963	1,979	1,999			
2018	165	187	238				
2019	807	875					
2020	393						

Development Factors

Accident Year	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - Ult
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2011	1.208	1.142	1.018	1.019	1.004	1.001	
2012	1.340	1.152	1.011	1.002	1.086	1.000	
2013	1.052	1.013	1.002	1.000	1.000	1.000	
2014	1.365	1.160	1.040	1.000	1.000	1.000	
2015	1.111	1.005	1.049	1.000	1.002		
2016	1.206	1.042	1.005	1.000			
2017	1.228	1.008	1.010				
2018	1.133	1.273					
2019	1.084						
Average	1.192	1.099	1.019	1.004	1.018	1.000	
Avg x hi / lo	1.187	1.086	1.017	1.000	1.002	1.000	
Avg 3 Year	1.148	1.108	1.021	1.000	1.001	1.000	
Avg 5 Year	1.153	1.098	1.021	1.000	1.018	1.000	
Prior	1.200	1.082	1.028	1.003	1.017	1.006	1.000
Selected	1.200	1.091	1.024	1.004	1.018	1.003	1.000
Cumulative	1.373	1.144	1.049	1.025	1.021	1.003	1.000

Notes:
Provided by TWIA, includes commercial and farm,
excludes hurricanes Brett (1999), Claudette (2003), Rita (2005), Humberto (2007), Dolly (2008),
and Ike (2008), Harvey (2017), Hanna (2020), Laura (2020), Delta (2020)

Texas Windstorm Insurance Association Exhibit 3
Commercial Property - Wind & Hail Sheet 2
Rate Level Review
Premium Trend Analysis
TWIA Commercial Earned Premium at Present Rates

Year / Quarter	Exposure Written	Written Premium	On-Level Factors	Written Premium at Present Rates Written	Average Written Premium at Present Rates Quarterly	Average Written Premium at Present Rates Four Quarter Ending	Exponential Fitted Trends All-Year	5-Year	4-Year	3-Year
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
2011 / 1	6,214	19,850,492	1.340	26,601,558	4,281					
2011 / 2	9,658	29,228,333	1.340	39,168,762	4,056					
2011 / 3	10,928	31,567,447	1.340	42,303,398	3,871					
2011 / 4	7,912	23,026,165	1.340	30,857,263	3,900	4,002				
2012 / 1	7,909	24,771,378	1.276	31,615,253	3,997	3,954	4,103			
2012 / 2	9,232	32,088,566	1.276	40,954,045	4,436	4,050	4,112			
2012 / 3	10,836	32,876,434	1.276	41,959,587	3,872	4,051	4,121			
2012 / 4	7,698	24,799,106	1.276	31,650,642	4,112	4,098	4,129			
2013 / 1	7,144	24,974,712	1.216	30,356,919	4,249	4,151	4,138			
2013 / 2	9,194	32,706,056	1.216	39,754,415	4,324	4,121	4,147			
2013 / 3	10,002	35,220,808	1.216	42,811,112	4,280	4,247	4,155			
2013 / 4	7,133	24,211,988	1.216	29,429,823	4,126	4,253	4,164			
2014 / 1	6,329	23,028,882	1.158	26,658,810	4,212	4,246	4,173			
2014 / 2	8,964	35,219,745	1.158	40,771,257	4,548	4,307	4,181			
2014 / 3	8,292	29,887,118	1.158	34,598,075	4,172	4,280	4,190			
2014 / 4	6,088	21,627,063	1.158	25,036,029	4,112	4,282	4,199			
2015 / 1	6,464	24,808,373	1.103	27,351,231	4,231	4,286	4,208			
2015 / 2	7,870	33,339,199	1.103	36,756,467	4,670	4,309	4,216			
2015 / 3	7,657	28,055,666	1.103	30,931,372	4,040	4,276	4,225			
2015 / 4	4,802	17,430,504	1.103	19,217,131	4,002	4,264	4,234			
2016 / 1	5,512	22,487,925	1.050	23,612,321	4,284	4,277	4,243	4,159.32		
2016 / 2	6,522	28,623,450	1.050	30,054,623	4,608	4,239	4,252	4,174.35		
2016 / 3	6,507	25,417,054	1.050	26,687,907	4,101	4,266	4,261	4,189.43		
2016 / 4	4,047	14,955,154	1.050	15,702,912	3,880	4,253	4,270	4,204.57		
2017 / 1	4,263	17,482,209	1.050	18,356,319	4,306	4,255	4,279	4,219.76	4,131.90	
2017 / 2	5,717	25,224,489	1.050	26,485,713	4,633	4,248	4,288	4,235.01	4,155.97	
2017 / 3	5,172	19,050,031	1.050	20,002,533	3,867	4,195	4,297	4,250.32	4,180.18	
2017 / 4	3,489	13,077,837	1.050	13,731,729	3,936	4,215	4,306	4,265.68	4,204.53	
2018 / 1	3,663	15,807,970	1.000	15,807,970	4,316	4,214	4,315	4,281.09	4,229.03	4,127.09
2018 / 2	5,108	22,862,777	1.000	22,862,777	4,476	4,154	4,324	4,296.56	4,253.66	4,165.95
2018 / 3	4,612	17,927,115	1.000	17,927,115	3,887	4,168	4,333	4,312.09	4,278.44	4,205.18
2018 / 4	3,109	12,284,401	1.000	12,284,401	3,951	4,177	4,342	4,327.67	4,303.36	4,244.78
2019 / 1	2,933	14,759,154	1.000	14,759,154	5,032	4,304	4,351	4,343.31	4,328.43	4,284.76
2019 / 2	4,431	20,959,587	1.000	20,959,587	4,730	4,371	4,360	4,359.00	4,353.64	4,325.11
2019 / 3	3,993	14,943,999	1.000	14,943,999	3,743	4,351	4,369	4,374.75	4,379.01	4,365.83
2019 / 4	2,966	12,109,737	1.000	12,109,737	4,083	4,383	4,378	4,390.56	4,404.51	4,406.95
2020 / 1	2,719	14,566,185	1.000	14,566,185	5,357	4,435	4,387	4,406.43	4,430.17	4,448.45
2020 / 2	3,982	18,776,705	1.000	18,776,705	4,715	4,421	4,396	4,422.35	4,455.98	4,490.34
2020 / 3	3,970	15,951,658	1.000	15,951,658	4,018	4,503	4,406	4,438.33	4,481.94	4,532.62
2020 / 4	2,710	13,543,203	1.000	13,543,203	4,997	4,696	4,415	4,454.37	4,508.04	4,575.31

(14)	Average Annual Change	0.8%	1.5%	2.4%	3.8%
(15)	Correlation Coefficient	29.1%	49.5%	68.1%	86.7%
(16)	Selected Premium Trend				2.5%

Notes:
(2) Provided by TWIA
(3) Provided by TWIA
(4) Factor to bring written premium to current rate level
(5) = (3) * (4)
(6) = (5) / (2)
(7) annualized average written premium
(8) - (11) fitted to an exponential distribution
(14) Fitted average annual change
(15) Evaluates the predictability of the fitted curve
(16) Selected based on judgment

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Loss Trend Analysis
Summary of Indices and Calculation of Prospective Loss Costs

Calendar Year Ending 12/31/xx	Commercial Statewide Boeckh	Commercial Coastal Boeckh	Residential Statewide Boeckh	Residential Coastal Boeckh	Modified CPI	Weighted Average
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2011	1.212	1.225	1.211	1.219	1.073	1.187
2012	1.167	1.173	1.179	1.187	1.053	1.143
2013	1.145	1.148	1.145	1.152	1.047	1.123
2014	1.113	1.110	1.108	1.106	1.033	1.091
2015	1.094	1.092	1.087	1.088	1.023	1.075
2016	1.099	1.096	1.098	1.100	1.007	1.074
2017	1.074	1.076	1.076	1.076	1.003	1.058
2018	1.031	1.034	1.033	1.029	0.993	1.024
2019	1.016	1.015	1.022	1.014	0.973	1.005
2020	1.000	1.000	1.000	1.000	1.000	1.000
Factors to Adjust For Prospective Loss Costs						
(8) Fitted Trend	2.3%	2.3%	1.7%	1.9%	0.7%	1.9%
(9) Cost Factor	1.059	1.058	1.044	1.049	1.018	1.048

Notes:
(2) = Exhibit 3, Sheet 3b trended forward to 12/31/2020
(3) = Exhibit 3, Sheet 3c trended forward to 12/31/2020
(4) = Residential Exhibit 3, Sheet 3b trended forward to 12/31/2020
(5) = Residential Exhibit 3, Sheet 3c trended forward to 12/31/2020
(6) = Exhibit 3, Sheet 3d
(7) = 25% CPI and 75% Boeckh (most appropriate available by year)
(8) = (2) - (7) fitted to an exponential curve using 5 years' data (where available)
(9) = [1 + (8)] ^ 2.5 (trended from 7/1/2020 to 1/1/2023)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Loss Trend Analysis
Boeckh Commercial Construction Index Trend (Statewide)

Calendar Year Ending	Texas Statewide Index	Fitted Trends All Years Linear	Exponential
(1)	(2)	(3)	(4)
3/31/2011	2144.86		
6/30/2011	2159.12		
9/30/2011	2182.25		
12/31/2011	2212.90		
3/31/2012	2240.48		
6/30/2012	2263.10		
9/30/2012	2282.01		
12/31/2012	2298.24	2295.47	2300.33
3/31/2013	2310.88	2307.20	2311.20
6/30/2013	2321.18	2318.94	2322.13
9/30/2013	2332.17	2330.68	2333.11
12/31/2013	2342.58	2342.41	2344.14
3/31/2014	2355.26	2354.15	2355.22
6/30/2014	2373.47	2365.89	2366.35
9/30/2014	2390.56	2377.62	2377.54
12/31/2014	2409.00	2389.36	2388.78
3/31/2015	2427.52	2401.09	2400.07
6/30/2015	2439.22	2412.83	2411.42
9/30/2015	2447.29	2424.57	2422.82
12/31/2015	2450.95	2436.30	2434.27
3/31/2016	2448.94	2448.04	2445.78
6/30/2016	2444.56	2459.78	2457.34
9/30/2016	2440.90	2471.51	2468.96
12/31/2016	2440.56	2483.25	2480.63
3/31/2017	2446.89	2494.98	2492.36
6/30/2017	2460.32	2506.72	2504.14
9/30/2017	2478.57	2518.46	2515.98
12/31/2017	2496.25	2530.19	2527.88
3/31/2018	2515.35	2541.93	2539.83
6/30/2018	2538.61	2553.66	2551.84
9/30/2018	2566.72	2565.40	2563.90
12/31/2018	2599.91	2577.14	2576.02
3/31/2019	2625.41	2588.87	2588.20
6/30/2019	2639.39	2600.61	2600.43
9/30/2019	2642.43	2612.35	2612.73
12/31/2019	2639.56	2624.08	2625.08
3/31/2020	2640.29	2635.82	2637.49
6/30/2020	2644.98	2647.55	2649.96
9/30/2020	2657.87	2659.29	2662.49
12/31/2020	2681.33	2671.03	2675.07
Annual Trend		1.8%	2.3%
R-Squared		0.957	0.960

Notes:
(2) = Average Index for Austin, Corpus Christi, Dallas, El Paso, Fort Worth, Houston, Odessa, and San Antonio
(3) - (4) = (2) fitted to linear and exponential distributions

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Loss Trend Analysis
Boeckh Commercial Construction Index Trend (Coastal)

Calendar Year Ending	Texas Coastal Index	Fitted Trends All Years Linear	Exponential
(1)	(2)	(3)	(4)
3/31/2009			
6/30/2009			
9/30/2009			
12/31/2009			
3/31/2010			
6/30/2010			
9/30/2010			
12/31/2010	2144.34	2188.11	2195.43
3/31/2011	2143.28	2201.65	2207.65
6/30/2011	2155.06	2215.19	2219.95
9/30/2011	2181.54	2228.73	2232.32
12/31/2011	2220.60	2242.27	2244.75
3/31/2012	2252.16	2255.81	2257.26
6/30/2012	2277.36	2269.35	2269.83
9/30/2012	2299.43	2282.89	2282.47
12/31/2012	2320.37	2296.43	2295.19
3/31/2013	2337.98	2309.97	2307.97
6/30/2013	2349.49	2323.51	2320.83
9/30/2013	2359.78	2337.05	2333.76
12/31/2013	2370.49	2350.59	2346.76
3/31/2014	2388.19	2364.13	2359.83
6/30/2014	2411.34	2377.67	2372.97
9/30/2014	2431.12	2391.21	2386.19
12/31/2014	2450.88	2404.75	2399.48
3/31/2015	2465.88	2418.29	2412.85
6/30/2015	2477.55	2431.83	2426.29
9/30/2015	2486.84	2445.37	2439.80
12/31/2015	2492.85	2458.90	2453.39
3/31/2016	2493.63	2472.44	2467.06
6/30/2016	2490.89	2485.98	2480.80
9/30/2016	2485.91	2499.52	2494.62
12/31/2016	2482.14	2513.06	2508.52
3/31/2017	2484.26	2526.60	2522.49
6/30/2017	2494.82	2540.14	2536.54
9/30/2017	2509.93	2553.68	2550.67
12/31/2017	2528.31	2567.22	2564.88
3/31/2018	2547.16	2580.76	2579.17
6/30/2018	2569.79	2594.30	2593.53
9/30/2018	2597.57	2607.84	2607.98
12/31/2018	2632.34	2621.38	2622.51
3/31/2019	2661.80	2634.92	2637.12
6/30/2019	2677.57	2648.46	2651.80
9/30/2019	2684.16	2662.00	2666.58
12/31/2019	2679.79	2675.54	2681.43
3/31/2020	2678.67	2689.08	2696.37
6/30/2020	2681.66	2702.62	2711.39
9/30/2020	2697.05	2716.16	2726.49
12/31/2020	2721.13	2729.69	2741.68
Annual Trend		2.0%	2.3%
R-Squared		0.962	0.954

Notes:
(2) = Average Index for Corpus Christi and Houston
(3) - (4) = (2) fitted to linear and exponential distributions

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Loss Trend Analysis
Modified Consumer Price Index - External Trend

Exhibit 3
Sheet 3d

		Fitted Trends							
Calendar Year	Modified	All Years		5 Years		4 Years		3 Years	
Ending	CPI	Linear	Exponential	Linear	Exponential	Linear	Exponential	Linear	Exponential
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
9/30/2010	178.59	179.59	179.74						
12/31/2010	178.72	180.10	180.22						
3/31/2011	178.97	180.60	180.70						
6/30/2011	179.61	181.11	181.18						
9/30/2011	180.52	181.61	181.66						
12/31/2011	181.55	182.12	182.15						
3/31/2012	182.78	182.62	182.64						
6/30/2012	183.87	183.13	183.12						
9/30/2012	184.57	183.63	183.61						
12/31/2012	185.03	184.14	184.10						
3/31/2013	185.38	184.64	184.59						
6/30/2013	185.51	185.15	185.09						
9/30/2013	185.82	185.65	185.58						
12/31/2013	186.03	186.16	186.08						
3/31/2014	186.43	186.66	186.57						
6/30/2014	186.87	187.16	187.07						
9/30/2014	187.59	187.67	187.57						
12/31/2014	188.62	188.17	188.07						
3/31/2015	189.46	188.68	188.58						
6/30/2015	189.59	189.18	189.08						
9/30/2015	190.03	189.69	189.58						
12/31/2015	190.50	190.19	190.09						
3/31/2016	190.95	190.70	190.60	192.23	192.24				
6/30/2016	192.03	191.20	191.11	192.59	192.59				
9/30/2016	192.82	191.71	191.62	192.94	192.94				
12/31/2016	193.56	192.21	192.13	193.29	193.28				
3/31/2017	193.86	192.72	192.64	193.64	193.63	194.17	194.18		
6/30/2017	194.07	193.22	193.16	193.99	193.98	194.47	194.47		
9/30/2017	194.20	193.73	193.67	194.34	194.33	194.76	194.76		
12/31/2017	194.18	194.23	194.19	194.70	194.68	195.06	195.05		
3/31/2018	194.71	194.74	194.71	195.05	195.03	195.35	195.34	196.16	196.15
6/30/2018	195.24	195.24	195.23	195.40	195.38	195.65	195.64	196.34	196.33
9/30/2018	195.63	195.75	195.75	195.75	195.73	195.94	195.93	196.52	196.51
12/31/2018	196.26	196.25	196.27	196.10	196.09	196.24	196.22	196.70	196.69
3/31/2019	197.08	196.75	196.80	196.45	196.44	196.53	196.52	196.88	196.87
6/30/2019	198.40	197.26	197.32	196.80	196.79	196.82	196.81	197.06	197.05
9/30/2019	199.83	197.76	197.85	197.16	197.15	197.12	197.11	197.24	197.23
12/31/2019	200.34	198.27	198.38	197.51	197.50	197.41	197.40	197.42	197.41
3/31/2020	199.75	198.77	198.91	197.86	197.86	197.71	197.70	197.60	197.59
6/30/2020	197.76	199.28	199.44	198.21	198.21	198.00	198.00	197.78	197.77
9/30/2020	195.97	199.78	199.97	198.56	198.57	198.30	198.29	197.96	197.95
12/31/2020	194.84	200.29	200.50	198.91	198.93	198.59	198.59	198.14	198.13
Annual Trend		1.0%	1.1%	0.7%	0.7%	0.6%	0.6%	0.4%	0.4%
R-Squared		0.953	0.952	0.632	0.636	0.399	0.401	0.102	0.102

Notes:

(2) = Weighted average of CPI for Lodging, Apparel, Furnishings, and Medical Care

(3) - (10) = (2) fitted to linear and exponential distributions

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Development of LAE factor Using TWIA Commercial + Residential Experience

Accident Year	Projected Ultimate Loss	Projected Ultimate LAE	Ultimate LAE to Loss Ratio	Hurricane Indicator
(1)	(2)	(3)	(4)	(5)
1980	12,911	1,318	0.102	H
1981	2,512	543	0.216	
1982	796	565	0.710	
1983	148,999	9,127	0.061	H
1984	999	324	0.324	
1985	512	297	0.580	
1986	881	505	0.573	H
1987	1,897	1,056	0.557	
1988	1,160	357	0.308	
1989	12,296	3,528	0.287	H
1990	335	225	0.672	
1991	1,217	729	0.599	
1992	489	554	1.133	
1993	3,375	1,375	0.407	
1994	679	507	0.747	
1995	2,977	903	0.303	
1996	1,166	582	0.499	
1997	2,964	1,343	0.453	
1998	22,401	4,732	0.211	
1999	8,773	2,388	0.272	H
2000	6,227	1,885	0.303	
2001	24,605	1,880	0.076	
2002	5,167	5,226	1.011	
2003	155,001	5,122	0.033	H
2004	5,167	1,471	0.285	
2005	154,981	20,235	0.131	H
2006	4,276	1,110	0.260	
2007	15,745	4,941	0.314	H
2008	2,583,017	346,615	0.134	H
2009	10,407	2,219	0.213	
2010	18,005	4,274	0.237	
2011	96,073	15,108	0.157	
2012	67,488	15,831	0.235	
2013	70,813	13,824	0.195	
2014	7,007	6,822	0.974	
2015	138,456	39,911	0.288	
2016	28,372	15,404	0.543	
2017	1,431,367	286,243	0.200	H
2018	11,949	6,729	0.563	
2019	17,428	9,193	0.527	
2020	85,005	31,704	0.373	H
All Years Total	5,163,895	866,705	0.168	
Hurricane Years Total	4,608,976	711,726	0.154	
Non-Hurricane Years				
Total	554,919	154,979	0.279	
10 Year	465,998	129,315	0.278	

Notes:
(2) Exhibit 4, Sheet 2
(3) Exhibit 4, Sheet 4
(4) = (3) / (2)
(5) "H" indicates hurricane year

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Ultimate Loss (TWIA All Lines)
$000 Omitted

Accident Year	Incurred Loss at 12/31/20	Development Factor	Indicated Ultimate Loss
(1)	(2)	(3)	(4)
1980			12911
1981			2,512
1982			796
1983			148,999
1984			999
1985			512
1986			881
1987			1,897
1988			1,160
1989			12,296
1990			335
1991			1,217
1992			489
1993			3,375
1994			679
1995			2,977
1996			1,166
1997			2,964
1998			22,401
1999			8,773
2000			6,227
2001			24,605
2002			5,167
2003			155,001
2004			5,167
2005			154,981
2006			4,276
2007			15,745
2008			2,583,017
2009			10,407
2010			18,005
2011			96,073
2012	67,488	1.000	67,488
2013	70,813	1.000	70,813
2014	7,007	1.000	7,007
2015	138,733	0.998	138,456
2016	28,457	0.997	28,372
2017	1,447,150	0.989	1,431,367
2018	12,193	0.980	11,949
2019	17,949	0.971	17,428
2020	87,095	0.976	85,005

Notes:

(2) Exhibit 4, Sheet 3

(3) Exhibit 4, Sheet 3

(4) 2012 - 2020: (2) * (3); 1980 - 2011: from prior TWIA annual statements

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Incurred Loss Development Factors
TWIA Schedule P Incurred Loss (Including IBNR)

Months of Development

Accident Year	12	24	36	48	60	72	84
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2011	94,870	96,967	97,503	96,828	96,263	95,964	96,073
2012	62,722	69,764	67,287	66,724	66,328	67,658	67,488
2013	77,204	75,204	72,860	71,823	71,286	71,068	70,813
2014	6,739	7,854	7,298	7,261	7,068	7,012	7,007
2015	147,927	139,955	140,459	139,777	138,801	138,733	
2016	31,292	29,612	28,908	28,523	28,457		
2017	1,278,467	1,373,877	1,445,588	1,447,150			
2018	13,197	12,326	12,193				
2019	18,155	17,949					
2020	87,095						

Development Factors

Accident Year	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - Ult
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2011	1.022	1.006	0.993	0.994	0.997	1.001	
2012	1.112	0.964	0.992	0.994	1.020	0.997	
2013	0.974	0.969	0.986	0.993	0.997	0.996	
2014	1.165	0.929	0.995	0.973	0.992	0.999	
2015	0.946	1.004	0.995	0.993	1.000		
2016	0.946	0.976	0.987	0.998			
2017	1.075	1.052	1.001				
2018	0.934	0.989					
2019	0.989						
Average	1.018	0.986	0.993	0.991	1.001	0.999	
Avg x hi / lo	1.009	0.985	0.992	0.993	0.998	0.998	
Avg 3 Year	0.999	1.006	0.994	0.988	0.996	0.998	
Avg 5 Year	0.978	0.990	0.993	0.990	1.001	0.999	
Prior	1.023	0.990	0.993	0.990	1.000	0.997	1.000
Selected	1.005	0.991	0.993	0.990	0.999	0.998	1.000
Cumulative	0.976	0.971	0.980	0.987	0.997	0.998	1.000

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Ultimate LAE (TWIA All Lines)

Accident Year	Incurred ALAE at 12/31/20	Development Factor	Indicated Ultimate DCC	Incurred AAO	Incurred LAE
(1)	(2)	(3)	(4)	(5)	(6)
1980					1318
1981					543
1982					565
1983					9,127
1984					324
1985					297
1986				270	235	505
1987				652	404	1,056
1988				235	122	357
1989				2,727	801	3,528
1990				119	106	225
1991				403	326	729
1992				270	284	554
1993				806	569	1,375
1994				192	315	507
1995				698	205	903
1996				355	227	582
1997				892	451	1,343
1998				3,920	812	4,732
1999				1,757	631	2,388
2000				1,209	676	1,885
2001				1,207	673	1,880
2002				3,643	1,583	5,226
2003				3,239	1,883	5,122
2004				844	627	1,471
2005				15,229	5,006	20,235
2006				860	250	1,110
2007				2,489	2,452	4,941
2008	99,668	1.000	99,668	246,947	346,615
2009	223	1.000	223	1,996	2,219
2010	323	1.000	323	3,951	4,274
2011	725	1.000	725	14,383	15,108
2012	868	1.000	868	14,963	15,831
2013	901	1.000	901	12,923	13,824
2014	1,026	1.000	1,026	5,796	6,822
2015	2,838	0.977	2,773	37,138	39,911
2016	542	0.964	522	14,882	15,404
2017	21,700	0.969	21,027	265,216	286,243
2018	352	1.029	362	6,367	6,729
2019	471	1.222	576	8,617	9,193
2020	295	1.833	541	31,163	31,704

Notes:

(2) Exhibit 4, Sheet 5
(3) Exhibit 4, Sheet 5
(4) 2008 - 2020: (2) * (3); 1986 - 2007: from TWIA's annual statements
(5) From TWIA's annual statements
(6) 1986 - 2020: (4) + (5); prior years from prior TWIA annual statements

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Incurred ALAE Development Factors
TWIA Schedule P Incurred DCC (Including IBNR)

Months of Development

Accident Year	12	24	36	48	60	72	84
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2010	391	312	322	316	335	324	323
2011	515	592	609	682	629	745	725
2012	516	679	719	632	917	880	868
2013	802	806	715	1,089	991	971	901
2014	516	493	1,085	1,266	1,077	1,028	1,026
2015	973	1,818	2,355	2,749	2,944	2,838	
2016	412	678	746	571	542		
2017	891	16,490	21,865	21,700			
2018	301	361	352				
2019	48	471					
2020	295						

Development Factors

Accident Year	12 - 24	24 - 36	36 - 48	48 - 60	60 - 72	72 - 84	84 - Ult
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2010	0.798	1.032	0.981	1.060	0.967	0.997	
2011	1.150	1.029	1.120	0.922	1.184	0.973	
2012	1.316	1.059	0.879	1.451	0.960	0.986	
2013	1.005	0.887	1.523	0.910	0.980	0.928	
2014	0.955	2.201	1.167	0.851	0.955	0.998	
2015	1.868	1.295	1.167	1.071	0.964		
2016	1.646	1.100	0.765	0.949			
2017	18.507	1.326	0.992				
2018	1.199	0.975					
2019	9.813						
Average	3.83	1.21	1.07	1.03	1.00	0.98	
Avg x hi / lo	2.37	1.12	1.05	0.98	0.97	0.99	
Avg 3 Year	9.84	1.13	0.98	0.96	0.97	0.97	
Avg 5 Year	6.61	1.38	1.12	1.05	1.01	0.97	
Prior	1.20	1.10	1.08	1.01	0.99	0.98	1.00
Selected	1.50	1.19	1.06	1.01	0.99	0.98	1.00
Cumulative	1.83	1.22	1.03	0.97	0.96	0.98	1.00

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Summary of Indicated Hurricane Loss & LAE Ratios

Exhibit 5

Basis for Hurricane Loss Ratio	Indicated Loss Ratio	LAE Factor	Indicated Loss & LAE Ratio
(1)	(2)	(3)	(4)
Industry Experience	44.8%	0.154	51.7%
Hurricane Models			
AIR Model	59.8%	0.154	69.0%
RMS Model	51.8%	0.154	59.8%
Average of Models	55.8%	0.154	64.4%

Notes:
(2) Exhibit 6 - Exhibit 8, Sheet 1
(3) Exhibit 4, Sheet 1
(4) = (2) * [1 + (3)]

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Industry Experience -- Commercial Extended Coverage
1970 - 2020 -- Hurricane Years Only

Accident Year	Earned Premium at Current TWIA Rate Level	Number of Hurricanes During the Year	Hurricane Year Incurred Loss Ratio	Per Hurricane Loss Ratio
	(1)	(2)	(3)	(4)
1970	50,792,436	1	45.5%	35.1%
1971	54,869,287	1	101.9%	91.5%
1980	60,963,960	1	63.0%	52.6%
1983	35,764,935	1	428.8%	418.4%
1986	46,088,241	1	8.4%	0.0%
1989	73,039,734	2	7.5%	0.0%
1999	167,481,109	1	8.2%	0.0%
2003	191,179,435	1	21.9%	11.5%
2005	253,206,423	1	165.6%	155.2%
2007	329,330,446	1	15.4%	5.0%
2008	298,516,833	2	471.0%	230.3%
2017	200,166,465	1	488.8%	478.4%
2020	192,123,007	3	11.3%	0.3%
Simple Average Loss Ratio Per Hurricane Year			141.3%	113.7%

(5)	Selected Non-Hurricane Loss Ratio	10.4%	
(6) a	Average Hurricane Loss Ratio Per Hurricane	113.7%	
(6) b	Selected Avg Hurricane Loss Ratio Per Hurricane	113.7%	
(7)	Historical Hurricane Frequency		
	(a) 51.0-Year (1/1/1970 - 12/31/2020)	0.333	(1 Hurricane Every 3.0 years)
	(b) 170-Year (1/1/1851 - 12/31/2020)	0.394	(1 Hurricane Every 2.5 years)
	Selected Frequency	0.394	(1 Hurricane Every 2.5 years)
(8)	Indicated Hurricane Loss Ratio	44.8%	

Notes:
(1) Exhibit 6, Sheet 2. 1999 year ending 12/31/99; all other accident years ending 9/30/xx
(3) Exhibit 6, Sheet 2. 1999 year ending 12/31/99; all other accident years ending 9/30/xx
(4) = MAX((3)-(5),0)/(2)
(5) Exhibit 6, Sheet 2
(6) a = Average of (4)
(6) b = Selected
(7) Exhibit 9
(8) = (6) b * (7) Selected

Texas Windstorm Insurance Association Exhibit 6
Commercial Property - Wind & Hail Sheet 2
Rate Level Review
Industry Experience -- Commercial Extended Coverage
1970 - 2020

Accident Year	Earned Premium	Earned Premium at 1992 CMR	Earned Premium at Current Rates	Incurred Losses	Incurred Loss Ratio	Hurricane Indicator
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1970	10,874,210	18,835,352	50,792,436	23,092,142	45.5%	H
1971	13,340,143	20,347,170	54,869,287	55,893,676	101.9%	H
1972	18,906,678	24,314,307	65,567,284	8,704,522	13.3%	
1973	21,737,541	23,257,532	62,717,527	3,837,493	6.1%	
1974	22,348,193	22,844,661	61,604,157	2,193,087	3.6%	
1975	24,396,629	24,958,305	67,303,925	3,943,412	5.9%	
1976	26,795,934	24,109,943	65,016,185	2,218,115	3.4%	
1977	30,910,821	27,119,226	73,131,182	1,898,346	2.6%	
1978	32,709,599	26,415,338	71,233,039	2,535,872	3.6%	
1979	31,306,685	24,514,306	66,106,613	4,535,147	6.9%	
1980	28,751,765	22,607,257	60,963,960	38,431,071	63.0%	H
1981	24,129,384	21,398,588	57,704,598	4,272,728	7.4%	
1982	18,505,004	17,523,231	47,254,099		3.4%	
1983	12,680,397	13,262,706	35,764,935		428.8%	H
1984	12,736,031	14,992,627	40,429,934		8.6%	
1985	15,169,575	16,422,895	44,286,873		4.2%	
1986	21,130,682	17,090,896	46,088,241		8.4%	H
1987	31,114,529	26,771,157	72,192,559		1.5%	
1988	25,065,531	24,117,319	65,036,076		9.7%	
1989	24,167,085	27,085,314	73,039,734		7.5%	H
1990	19,677,404	23,041,233	62,134,244		114.1%	
1991	21,794,680	25,534,881	68,858,751		57.2%	
1992	23,737,753	26,950,473	72,676,113		1.5%	
1993	21,990,182		68,130,740		6.5%	
1994	16,604,950		51,446,028		8.2%	
1995	32,374,229		100,302,951		19.3%	
1996	55,367,089		171,540,222		2.4%	
1997	53,196,024		164,813,754		3.9%	
1998	53,986,058		169,808,593		15.7%	
1999	52,435,243		167,481,109		8.2%	H
2000	41,739,697		127,577,928		6.8%	
2001	42,330,042		121,608,678		5.8%	
2002	69,156,402		190,103,989		14.4%	
2003	78,368,305		191,179,435		21.9%	H
2004	112,957,791		263,371,782		2.1%	
2005	119,598,806		253,206,423		165.6%	H
2006	148,019,940		285,101,407		2.2%	
2007	186,207,969		329,330,446		15.4%	H
2008	177,673,659		298,516,833		471.0%	H
2009	185,204,697		282,175,185		2.7%	
2010	193,721,394		272,686,040		3.9%	
2011	192,278,480		264,251,356		15.2%	
2012	209,380,185		273,658,568		19.0%	
2013	229,937,556		286,344,460		7.2%	
2014	240,200,938		285,205,614		1.5%	
2015	232,763,329		262,983,853		14.2%	
2016	216,197,758		232,605,381		3.9%	
2017	190,634,728		200,166,465		488.8%	H
2018	191,624,172		196,287,252		1.8%	
2019	189,154,663		189,154,663		6.9%	
2020	192,123,007		192,123,007		11.3%	H
Total / Average	4,237,213,546		7,275,933,913		44.2%	
Average of Non-Hurricane Years					11.0%	
Average of Non-Hurricane Years Excluding 1991					9.7%	
Selected					10.4%	

Notes: (2) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2020 are year ending 12/31/xx as of 12/31/20
(3) Provided by TDI (1992 MR = 1992 manual rates)
(4) 1993 - 2020: Sum of Exhibit 6, Sheet 4 - 7, (5); 1970 - 1992: (3) * 2.697,1992 on-level factor to bring industry premium to TWIA curr't rate lvl
(5) Provided by TDI. 1970 - 1982 are year ending 9/30/xx as of 12/31/99; 1983 - 2020 are year ending 12/31/xx as of 12/31/20
(6) 1983 - 2020: Exhibit 6, Sheet 3; 1970 - 1982: (5) / (4)
(7) "H" indicates occurrence of hurricane(s) during the time period (years ending 12/31/xx)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Industry Experience -- Commercial Extended Coverage

Loss Ratios by Territory / Tier

Accident Year	Territory 8	Territory 9	Territory 10	Tier 2	Weighted Loss Ratio	Devel't Wtd Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1983	1009.5%	4.3%	47.0%	169.1%	428.8%	428.8%
1984	8.6%	4.3%	11.1%	16.2%	8.6%	8.6%
1985	4.2%	2.8%	5.0%	9.1%	4.2%	4.2%
1986	3.3%	1.1%	18.3%	14.3%	8.4%	8.4%
1987	0.5%	1.9%	2.3%	3.4%	1.5%	1.5%
1988	13.2%	3.9%	9.3%	5.4%	9.7%	9.7%
1989	15.3%	2.0%	2.2%	6.2%	7.5%	7.5%
1990	270.6%	2.8%	10.1%	7.8%	114.1%	114.1%
1991	24.4%	24.2%	114.8%	5.3%	57.2%	57.2%
1992	0.9%	1.1%	2.4%	4.3%	1.5%	1.5%
1993	13.5%	1.7%	1.7%	5.7%	6.5%	6.5%
1994	0.3%	3.7%	19.6%	7.9%	8.2%	8.2%
1995	7.8%	10.3%	37.6%	20.6%	19.3%	19.3%
1996	1.5%	2.9%	3.1%	6.6%	2.4%	2.4%
1997	5.2%	2.0%	3.6%	9.0%	3.9%	3.9%
1998	20.7%	13.7%	11.4%	9.0%	15.7%	15.7%
1999	2.7%	12.6%	11.7%	8.9%	8.2%	8.2%
2000	2.1%	2.0%	13.8%	58.9%	6.8%	6.8%
2001	7.0%	3.2%	5.7%	28.7%	5.8%	5.8%
2002	11.7%	31.3%	7.2%	9.6%	14.4%	14.4%
2003	2.5%	8.8%	51.3%	32.6%	21.9%	21.9%
2004	2.9%	0.6%	2.0%	3.1%	2.1%	2.1%
2005	66.6%	1.7%	377.9%	50.8%	165.6%	165.6%
2006	2.3%	1.1%	2.6%	5.9%	2.2%	2.2%
2007	1.6%	56.5%	5.9%	9.9%	15.4%	15.4%
2008	699.1%	36.4%	481.8%	489.0%	471.0%	471.0%
2009	2.5%	4.7%	1.6%	9.6%	2.7%	2.7%
2010	1.5%	4.6%	6.1%	3.4%	3.9%	3.9%
2011	3.9%	30.2%	18.6%	19.3%	15.2%	15.2%
2012	19.0%	24.0%	16.0%	10.9%	19.0%	19.0%
2013	14.2%	4.2%	1.3%	7.4%	7.2%	7.2%
2014	0.6%	3.4%	1.3%	4.6%	1.5%	1.5%
2015	12.1%	4.4%	22.6%	14.2%	14.2%	14.2%
2016	0.9%	8.0%	3.8%	32.2%	3.8%	3.9%
2017	79.8%	1230.3%	466.0%	132.4%	476.9%	488.8%
2018	0.6%	2.6%	2.2%	14.3%	1.7%	1.8%
2019	1.1%	1.5%	13.9%	17.2%	6.0%	6.9%
2020	2.8%	6.1%	15.0%	28.5%	8.2%	11.3%
Average	61.5%	41.1%	48.1%	34.0%	51.9%	52.3%

TWIA 2020 Written Premium by Territory / Tier

		Territory 8	Territory 9	Territory 10	Tier 2	Total
(8)	Amount	23,600,606	12,937,187	21,233,021	418,777	58,189,591
(9)	% Share	40.56%	22.23%	36.49%	0.72%	100.00%

Notes:

(2) Exhibit 6, Sheet 4
(3) Exhibit 6, Sheet 5
(4) Exhibit 6, Sheet 6
(5) Exhibit 6, Sheet 7
(6) = Weighted average of (2) to (5), using (9)
(7) = (6) * loss development factors from Exhibit 2.2
(8) Provided by TWIA

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Industry Experience -- Commercial Extended Coverage
Tier 1 -- Territory 8 (Galveston County)

Accident Year	Earned Premium	Earned Premium at 1992 MR	TWIA Factor to Current Rate Level	Earned Premium at Current Rates	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1983	913,865	968,224	3.647	2,610,966	26,357,425	1009.5%
1984	1,195,339	1,366,667	3.344	3,685,429	318,455	8.6%
1985	2,581,481	2,777,593	2.742	7,490,209	314,878	4.2%
1986	3,013,362	2,349,181	1.952	6,334,929	211,282	3.3%
1987	3,004,153	2,585,122	1.899	6,971,181	37,480	0.5%
1988	2,905,355	2,728,206	2.045	7,357,029	969,836	13.2%
1989	2,825,114	3,015,974	2.272	8,133,040	1,244,199	15.3%
1990	2,303,321	2,474,141	2.386	6,671,903	18,053,460	270.6%
1991	2,203,500	2,080,579	2.372	5,610,603	1,371,244	24.4%
1992	2,352,391	2,012,473	2.697	5,426,944	46,331	0.9%
1993	2,406,016		3.098	7,454,402	1,005,945	13.5%
1994	2,807,090		3.098	8,697,023	28,034	0.3%
1995	2,645,757		3.098	8,197,175	635,625	7.8%
1996	5,519,716		3.098	17,101,374	249,644	1.5%
1997	5,461,636		3.098	16,921,429	886,485	5.2%
1998	6,133,105		3.145	19,291,165	3,994,564	20.7%
1999	6,706,028		3.194	21,419,430	575,316	2.7%
2000	4,997,201		3.057	15,274,010	320,131	2.1%
2001	4,785,262		2.873	13,747,432	962,576	7.0%
2002	8,206,069		2.749	22,557,658	2,632,325	11.7%
2003	8,793,047		2.439	21,450,633	529,845	2.5%
2004	12,425,339		2.332	28,970,854	830,387	2.9%
2005	13,839,253		2.114	29,255,465	19,469,845	66.6%
2006	18,414,310		1.940	35,721,811	812,370	2.3%
2007	24,924,710		1.769	44,082,248	710,669	1.6%
2008	24,970,117		1.680	41,953,322	293,310,706	699.1%
2009	29,363,002		1.524	44,737,043	1,140,669	2.5%
2010	31,708,901		1.408	44,634,072	669,882	1.5%
2011	31,323,614		1.374	43,048,538	1,675,264	3.9%
2012	35,160,065		1.307	45,953,981	8,709,842	19.0%
2013	37,701,656		1.245	46,950,400	6,670,061	14.2%
2014	38,317,853		1.187	45,497,186	258,179	0.6%
2015	36,840,517		1.130	41,623,658	5,027,267	12.1%
2016	36,237,812		1.076	38,987,962	331,694	0.9%
2017	32,650,010		1.050	34,282,511	27,362,175	79.8%
2018	33,232,388		1.024	34,041,082	220,785	0.6%
2019	33,676,571		1.000	33,676,571	369,052	1.1%
2020	34,373,655		1.000	34,373,655	959,900	2.8%
Total	586,918,581			900,194,322	429,273,827	47.7%

Notes:

(2) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2020 are year ending 12/31/xx as of 12/31/20

(3) Provided by TDI (1992 MR = 1992 manual rates)

(4) Represents 8/1/80 through 6/30/20 rate changes for TWIA; factors assume uniform earning of written premium and that TWIA premium represents 84.6% of industry data in Tier 1 -- Territory 8

(5) = (3) * 2.697 for 1983 - 1992; (2) * (4) for 1993 - 2020

(6) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2010 are year ending 12/31/xx as of 12/31/19 2011 - 2020 are year ending 12/31/xx as of 12/31/2020; 2008 IKE incurred loss was adjusted down by $99,433,917

(7) = (6) / (5)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Industry Experience -- Commercial Extended Coverage
Tier 1 -- Territory 9 (Nueces County)

Accident Year	Earned Premium	Earned Premium at 1992 MR	TWIA Factor to Current Rate Level	Earned Premium at Current Rates	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1983	745,985	820,826	3.647	2,213,484	96,051	4.3%
1984	558,639	652,809	3.344	1,760,400	76,481	4.3%
1985	1,235,059	1,383,103	2.742	3,729,751	106,148	2.8%
1986	2,228,911	1,849,840	1.952	4,988,379	56,387	1.1%
1987	2,381,538	2,086,940	1.899	5,627,756	105,275	1.9%
1988	1,796,653	1,719,227	2.045	4,636,161	181,414	3.9%
1989	1,632,453	1,826,430	2.272	4,925,251	98,116	2.0%
1990	1,429,526	1,769,972	2.386	4,773,003	135,678	2.8%
1991	1,390,109	1,555,310	2.372	4,194,134	1,013,636	24.2%
1992	1,571,433	1,629,721	2.697	4,394,794	49,512	1.1%
1993	1,587,772		3.098	4,919,290	86,000	1.7%
1994	2,203,514		3.098	6,827,003	254,088	3.7%
1995	2,669,951		3.098	8,272,134	854,753	10.3%
1996	5,639,923		3.098	17,473,804	502,177	2.9%
1997	3,183,758		3.098	9,864,029	199,390	2.0%
1998	3,613,310		3.145	11,365,362	1,561,275	13.7%
1999	6,808,428		3.194	21,746,501	2,735,082	12.6%
2000	5,167,158		3.057	15,793,486	317,804	2.0%
2001	4,763,324		2.873	13,684,407	431,244	3.2%
2002	8,479,915		2.749	23,310,433	7,300,265	31.3%
2003	9,934,549		2.439	24,235,327	2,122,879	8.8%
2004	14,597,450		2.332	34,035,336	212,644	0.6%
2005	16,137,249		2.114	34,113,310	566,758	1.7%
2006	21,249,313		1.940	41,221,416	434,362	1.1%
2007	27,752,523		1.769	49,083,564	27,752,523	56.5%
2008	27,990,909		1.680	47,028,679	17,103,924	36.4%
2009	29,085,395		1.524	44,314,085	2,074,340	4.7%
2010	27,439,364		1.408	38,624,188	1,768,194	4.6%
2011	25,580,489		1.374	35,155,671	10,619,019	30.2%
2012	26,831,417		1.307	35,068,491	8,414,788	24.0%
2013	28,334,583		1.245	35,285,453	1,477,307	4.2%
2014	28,267,107		1.187	33,563,306	1,132,676	3.4%
2015	26,812,777		1.130	30,293,979	1,325,668	4.4%
2016	22,912,415		1.076	24,651,278	1,974,664	8.0%
2017	19,484,319		1.050	20,458,535	251,706,752	1230.3%
2018	18,825,039		1.024	19,283,137	495,300	2.6%
2019	16,984,000		1.000	16,984,000	254,477	1.5%
2020	16,737,238		1.000	16,737,238	1,014,456	6.1%
Total	464,043,495			754,636,555	346,611,507	45.9%

Notes:

(2) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2020 are year ending 1/0/xx as of 12/31/20

(3) Provided by TDI (1992 MR = 1992 manual rates)

(4) Represents 8/1/80 through 6/30/20 rate changes for TWIA; factors assume uniform earning of written premium and that TWIA premium represents 85.0% of industry data in Tier 1 -- Territory 9

(5) = (3) * (4) for 1983 - 1992; (2) * (4) for 1993 - 2020

(6) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2010 are year ending 12/31/xx as of 12/31/19 2011 - 2020 are year ending 12/31/xx as of 12/31/2020

(7) = (6) / (5)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Industry Experience -- Commercial Extended Coverage
Tier 1 -- Territory 10 (Other Tier 1)

Accident Year	Earned Premium	Earned Premium at 1992 MR	TWIA Factor to Current Rate Level	Earned Premium at Current Rates	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1983	3,769,988	4,139,464	3.647	11,162,704	5,242,728	47.0%
1984	4,835,650	5,883,059	3.344	15,864,577	1,759,233	11.1%
1985	3,637,366	3,997,227	2.742	10,779,140	534,724	5.0%
1986	4,787,352	3,948,102	1.952	10,646,667	1,943,819	18.3%
1987	5,996,981	5,352,970	1.899	14,435,110	338,938	2.3%
1988	5,872,305	5,768,621	2.045	15,555,978	1,442,599	9.3%
1989	5,125,436	5,918,163	2.272	15,959,241	349,413	2.2%
1990	3,842,130	4,624,825	2.386	12,471,555	1,263,817	10.1%
1991	4,253,902	4,765,878	2.372	12,851,926	14,752,702	114.8%
1992	4,034,147	4,187,015	2.697	11,290,933	276,158	2.4%
1993	4,540,606		3.098	14,067,862	245,603	1.7%
1994	5,145,260		3.098	15,941,222	3,130,886	19.6%
1995	9,324,050		3.098	28,888,093	10,852,486	37.6%
1996	15,331,047		3.098	47,499,178	1,478,175	3.1%
1997	17,116,368		3.098	53,030,521	1,911,482	3.6%
1998	17,623,413		3.145	55,432,959	6,340,723	11.4%
1999	15,019,386		3.194	47,972,762	5,614,569	11.7%
2000	11,756,138		3.057	35,932,789	4,969,254	13.8%
2001	11,140,104		2.873	32,004,063	1,824,700	5.7%
2002	20,528,832		2.749	56,431,693	4,053,342	7.2%
2003	23,885,668		2.439	58,269,073	29,908,218	51.3%
2004	31,412,192		2.332	73,240,499	1,462,655	2.0%
2005	34,104,704		2.114	72,095,581	272,418,664	377.9%
2006	46,246,638		1.940	89,713,579	2,315,133	2.6%
2007	71,922,575		1.769	127,203,437	7,479,422	5.9%
2008	66,558,177		1.680	111,827,135	538,764,477	481.8%
2009	64,583,344		1.524	98,398,245	1,576,316	1.6%
2010	63,606,679		1.408	89,534,011	5,423,427	6.1%
2011	63,551,427		1.374	87,339,731	16,247,025	18.6%
2012	68,591,165		1.307	89,648,216	14,306,241	16.0%
2013	73,420,714		1.245	91,431,844	1,168,092	1.3%
2014	68,422,034		1.187	81,241,765	1,035,684	1.3%
2015	62,624,006		1.130	70,754,712	15,965,625	22.6%
2016	57,267,972		1.076	61,614,138	2,364,800	3.8%
2017	46,621,435		1.050	48,952,507	228,140,755	466.0%
2018	44,690,435		1.024	45,777,955	1,029,395	2.2%
2019	43,334,861		1.000	43,334,861	6,010,489	13.9%
2020	43,110,698		1.000	43,110,698	6,454,822	15.0%
Total	1,147,635,185			1,901,706,960	1,220,396,591	64.2%

Notes:

(2) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2020 are year ending 12/31/xx as of 12/31/20

(3) Provided by TDI (1992 MR = 1992 manual rates)

(4) Represents 8/1/80 through 6/30/20 rate changes for TWIA; factors assume uniform earning of written premium and that TWIA premium represents 67.7% of industry data in Tier 1 -- Territory 10

(5) = (3) * (4) for 1983 - 1992; (2) * (4) for 1993 - 2020

(6) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2010 are year ending 12/31/xx as of 12/31/19 2011 - 2020 are year ending 12/31/xx as of 12/31/2020

(7) = (6) / (5)

Industry experience is for EC, where wind and hail related loss is predominant

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Industry Experience -- Commercial Extended Coverage
Tier 2 (Territories 1 and 11)

AY Ending	Earned Premium	Earned Premium at 1992 MR	TWIA Factor to Current Rate Level	Earned Premium at Current Rates	Incurred Loss	Incurred Loss Ratio
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1983	7,250,559	7,334,192	3.647	19,777,782	33,451,768	169.1%
1984	6,146,403	7,090,092	3.344	19,119,528	3,096,573	16.2%
1985	7,715,669	8,264,972	2.742	22,287,774	2,019,280	9.1%
1986	11,101,057	8,943,773	1.952	24,118,265	3,439,343	14.3%
1987	19,731,857	16,746,125	1.899	45,158,513	1,552,595	3.4%
1988	14,491,218	13,901,265	2.045	37,486,908	2,041,063	5.4%
1989	14,584,082	16,324,747	2.272	44,022,202	2,746,147	6.2%
1990	12,102,427	14,172,295	2.386	38,217,783	2,967,816	7.8%
1991	13,947,169	17,133,114	2.372	46,202,088	2,440,246	5.3%
1992	15,779,782	19,121,264	2.697	51,563,442	2,232,412	4.3%
1993	13,455,788		3.098	41,689,186	2,357,383	5.7%
1994	6,449,086		3.098	19,980,780	1,579,205	7.9%
1995	17,734,471		3.098	54,945,549	11,314,057	20.6%
1996	28,876,403		3.098	89,465,866	5,938,855	6.6%
1997	27,434,262		3.098	84,997,775	7,691,121	9.0%
1998	26,616,230		3.145	83,719,107	7,574,576	9.0%
1999	23,901,401		3.194	76,342,416	6,821,707	8.9%
2000	19,819,200		3.057	60,577,643	35,670,537	58.9%
2001	21,641,352		2.873	62,172,776	17,852,673	28.7%
2002	31,941,586		2.749	87,804,205	8,461,924	9.6%
2003	35,755,041		2.439	87,224,402	28,411,179	32.6%
2004	54,522,810		2.332	127,125,093	3,982,223	3.1%
2005	55,697,704		2.114	117,742,067	59,821,556	50.8%
2006	61,057,252		1.940	118,444,601	6,946,289	5.9%
2007	61,608,161		1.769	108,961,197	10,794,322	9.9%
2008	58,154,456		1.680	97,707,697	477,796,637	489.0%
2009	62,172,956		1.524	94,725,812	9,127,735	9.6%
2010	70,966,450		1.408	99,893,769	3,378,802	3.4%
2011	71,822,950		1.374	98,707,416	19,035,462	19.3%
2012	78,797,538		1.307	102,987,880	11,222,175	10.9%
2013	90,480,603		1.245	112,676,763	8,356,375	7.4%
2014	105,193,944		1.187	124,903,357	5,759,536	4.6%
2015	106,486,029		1.130	120,311,504	17,052,994	14.2%
2016	99,779,559		1.076	107,352,003	34,559,360	32.2%
2017	91,878,964		1.050	96,472,912	127,757,654	132.4%
2018	94,876,310		1.024	97,185,078	13,905,654	14.3%
2019	95,159,231		1.000	95,159,231	16,352,147	17.2%
2020	97,901,416		1.000	97,901,416	27,909,039	28.5%
Total	1,733,031,376			2,915,131,784	1,043,418,420	35.8%

Notes:

(2) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2020 are year ending 12/31/xx as of 12/31/20

(3) Provided by TDI (1992 MR = 1992 manual rates)

(4) Represents 8/1/80 through 6/30/20 rate changes for TWIA; factors assume uniform earning of written premium and that TWIA premium represents 0.9% of industry data in Tier 2

(5) = (3) * (4) for 1983 - 1992; (2) * (4) for 1993 - 2020

(6) Provided by TDI. 1983 - 1995 are year ending 9/30/xx as of 12/31/99; 1996 - 2010 are year ending 12/31/xx as of 12/31/19 2011 - 2020 are year ending 12/31/xx as of 12/31/2020

(7) = (6) / (5)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Hurricane Loss Ratio -- AIR Model

County	TWIA Insured Values (000s) as of 11/30/20	Modeled Loss Cost	Expected Annual Hurricane Loss
(1)	(2)	(3)	(4)
Aransas	224,503	3.491	783,740
Brazoria	371,208	3.150	1,169,305
Calhoun	107,233	3.646	390,972
Cameron	921,918	3.808	3,510,664
Chambers	46,088	2.698	124,345
Galveston	2,345,875	8.885	20,843,099
Harris	33,370	5.200	173,524
Jefferson	299,591	2.704	810,094
Kenedy	694	1.194	829
Kleberg	12,889	1.112	14,333
Matagorda	74,150	3.205	237,651
Nueces	1,450,354	4.139	6,003,015
Refugio	18,370	1.623	29,815
San Patricio	109,065	2.334	254,558
Willacy	14,131	2.510	35,469
Total	6,029,439	5.702	34,381,413
(5) Inforce-Premium as of 11/30/20 at Present Rates			57,446,069
(6) Indicated Hurricane Loss Ratio			59.8%

Notes:
(2) Provided by TWIA
(3) Exhibit 7, Sheet 2
(4) = (2) * (3)
(5) Provided by TWIA
(6) = (4) Total / (5)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
AIR Simulated Hurricane Results

County	TWIA Insured Values (000s) as of 11/30/20	Average Annual Modeled Loss	Modeled Loss Cost
(1)	(2)	(3)	(4)
Aransas	224,503	783,751	3.491
Brazoria	371,208	1,169,444	3.150
Calhoun	107,233	390,927	3.646
Cameron	921,918	3,510,234	3.808
Chambers	46,088	124,355	2.698
Galveston	2,345,875	20,843,002	8.885
Harris	33,370	173,531	5.200
Jefferson	299,591	810,085	2.704
Kenedy	694	829	1.194
Kleberg	12,889	14,333	1.112
Matagorda	74,150	237,664	3.205
Nueces	1,450,354	6,002,489	4.139
Refugio	18,370	29,823	1.623
San Patricio	109,065	254,566	2.334
Willacy	14,131	35,470	2.510
Total	6,029,439	34,380,504	5.702

Notes:
(2) Provided by TWIA and Geo-coded by AIR
(3) Provided by AIR
(4) = (3) / (2)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Hurricane Loss Ratio -- RMS Model

County	TWIA Insured Values (000s) as of 11/30/20	Modeled Loss Cost	Expected Annual Hurricane Loss
(1)	(2)	(3)	(4)
Aransas	224,503	3.327	746,921
Brazoria	371,208	3.497	1,298,114
Calhoun	107,233	4.589	492,092
Cameron	921,918	5.003	4,612,356
Chambers	46,088	3.220	148,403
Galveston	2,345,875	6.423	15,067,555
Harris	33,370	5.048	168,452
Jefferson	299,591	2.718	814,288
Kenedy	694	2.323	1,612
Kleberg	12,889	1.933	24,914
Matagorda	74,150	4.016	297,786
Nueces	1,450,354	3.911	5,672,334
Refugio	18,370	2.614	48,019
San Patricio	109,065	3.040	331,558
Willacy	14,131	3.968	56,072
Total	6,029,439	4.939	29,780,476
(5) Inforce-Premium as of 11/30/20 at Present Rates			57,446,069
(6) Indicated Hurricane Loss Ratio			51.8%

Notes:
(2) Provided by TWIA
(3) Exhibit 8, Sheet 2
(4) = (2) * (3)
(5) Provided by TWIA
(6) = (4) Total / (5)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
RMS Simulated Hurricane Results

County	TWIA Insured Values (000s) as of 11/30/20	Average Annual Modeled Loss	Modeled Loss Cost
(1)	(2)	(3)	(4)
Aransas	224,503	747,029	3.327
Brazoria	371,208	1,297,940	3.497
Calhoun	107,233	492,106	4.589
Cameron	921,918	4,611,909	5.003
Chambers	46,088	148,423	3.220
Galveston	2,345,875	15,067,594	6.423
Harris	33,370	168,442	5.048
Jefferson	299,591	814,347	2.718
Kenedy	694	1,612	2.323
Kleberg	12,889	24,910	1.933
Matagorda	74,150	297,806	4.016
Nueces	1,450,354	5,672,257	3.911
Refugio	18,370	48,028	2.614
San Patricio	109,065	331,557	3.040
Willacy	14,131	56,074	3.968
Total	6,029,439	29,780,034	4.939

Notes:
(2) Provided by TWIA and Geo-coded by RMS
(3) Provided by RMS Excluding Storm Surge
(4) = (3) / (2)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Texas Hurricanes 1850 - 2020

Exhibit 9

Landfall Year	Month	Name	Landfall Year	Month	Name
	(1)	(2)		(1)	(2)
1851	Jun		1933	Sep	
1854	Jun		1934	Jul	
1854	Sep	“Matagorda”	1936	Jun	
1865	Sep	“Sabine River-Lake Calcasieu”	1940	Aug	
1866	Jul		1941	Sep	
1867	Oct	“Galveston”	1942	Aug	
1869	Aug	“Lower Texas Coast"	1942	Aug	
1875	Sep		1943	Jul	
1879	Aug		1945	Aug	
1880	Aug		1947	Aug	
1882	Sep		1949	Oct	
1886	Jun		1957	Jun	Audrey
1886	Aug	“Indianola”	1959	Jul	Debra
1886	Sep		1961	Sep	Carla
1886	Oct		1963	Sep	Cindy
1887	Sep		1967	Sep	Beulah
1888	Jun		1970	Aug	Celia
1891	Jul		1971	Sep	Fern
1895	Aug		1980	Aug	Allen
1897	Sep		1983	Aug	Alicia
1900	Sep	“Galveston”	1986	Jun	Bonnie
1909	Jun		1989	Aug	Chantal
1909	Jul	“Velasco”	1989	Oct	Jerry
1909	Aug		1999	Aug	Bret
1910	Sep		2003	Jul	Claudette
1912	Oct		2005	Sep	Rita
1913	Jun		2007	Sep	Humberto
1915	Aug	“Galveston”	2008	Jul	Dolly
1916	Aug		2008	Sep	Ike
1919	Sep		2017	Aug	Harvey
1921	Jun		2020	Jul	Hanna
1929	Jun		2020	Aug	Laura
1932	Aug	“Freeport”	2020	Oct	Delta
1933	Aug				

Frequency	Date Period	Hurricanes	Period	Annual Frequency
51.0-Year	1/1/1970 - 12/31/2020	17	51	0.333
170-Year	1/1/1851 - 12/31/2020	67	170	0.394

Notes:
(1), (2) from NOAA Technical Memorandum NWS-NHC-6, updated with actual experience through 2020

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Calculation of Earned Premium at Present Rate Level

Year	TWIA Written Premium	Factor to Current Rate Level	Written Premium at Current Rate Level	Earned Premium at Current Rate Level
(1)	(2)	(3)	(4)	(5)
1994	10,672,677	3.098	33,063,953	33,063,953
1995	12,865,905	3.098	39,858,574	36,461,264
1996	15,640,660	3.098	48,454,765	44,156,670
1997	16,536,186	3.098	51,229,104	49,841,935
1998	16,558,977	3.193	52,872,814	52,050,959
1999	17,394,142	3.193	55,539,496	54,206,155
2000	17,332,561	2.930	50,784,404	53,161,950
2001	17,544,251	2.817	49,422,155	50,103,280
2002	24,013,525	2.684	64,452,301	56,937,228
2003	29,220,514	2.440	71,298,054	67,875,178
2004	31,009,323	2.218	68,778,678	70,038,366
2005	35,740,174	2.016	72,052,191	70,415,435
2006	76,847,840	1.870	143,705,461	107,878,826
2007	110,951,718	1.714	190,171,245	166,938,353
2008	98,036,118	1.633	160,092,981	175,132,113
2009	111,269,573	1.423	158,336,602	159,214,792
2010	102,174,680	1.407	143,759,774	151,048,188
2011	100,017,021	1.340	134,022,808	138,891,291
2012	110,524,397	1.276	141,029,130	137,525,969
2013	112,904,624	1.216	137,292,023	139,160,577
2014	104,642,688	1.158	121,176,233	129,234,128
2015	98,715,934	1.102	108,784,959	114,980,596
2016	88,278,690	1.050	92,692,625	100,738,792
2017	70,749,081	1.050	74,286,535	83,489,580
2018	65,696,833	1.000	65,696,833	69,991,684
2019	59,123,729	1.000	59,123,729	62,410,281
2020	60,327,052	1.000	60,327,052	59,725,391
Total	1,614,788,872		2,448,304,479	2,434,672,934

Notes:

(2) Provided by TWIA

(3) Exhibit 10, Sheet 2

(4) = (2) * (3) (calculated on a monthly basis)

(5) Calculated from (4), using annual uniform earning assumption for 2002 and prior and monthly for 2003 and after

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Calculation of On-Level Premium Factors

Year	Rate Level in Effect Applicable Rates B.O.Y.			E.O.Y.	Cumulative Rate Level B.O.Y.			E.O.Y.	# Months B.O.Y.			E.O.Y.	Average Rate Level	Factor to Current Rate Level
(1)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1980	Prior			8/1/1980	1.000			1.175	7.0			5.0	1.073	4.637
1981	8/1/1980			9/1/1981	1.175			1.132	8.0			4.0	1.161	4.285
1982	9/1/1981			9/1/1982	1.132			1.428	8.0			4.0	1.231	4.042
1983	9/1/1982			10/10/1983	1.428			1.514	9.3			2.7	1.447	3.438
1984	10/10/1983			10/10/1983	1.514			1.514	12.0			0.0	1.514	3.286
1985	10/10/1983	3/1/1985	3/15/1985	11/15/1985	1.514	1.892	2.428	2.651	2.0	0.5	8.0	1.5	2.281	2.181
1986	11/15/1985			11/15/1985	2.651			2.651	12.0			0.0	2.651	1.877
1987	11/15/1985			7/1/1987	2.651			2.407	6.0			6.0	2.529	1.967
1988	7/1/1987			11/1/1988	2.407			2.075	10.0			2.0	2.352	2.115
1989	11/1/1988			11/1/1988	2.075			2.075	12.0			0.0	2.075	2.398
1990	11/1/1988			3/1/1990	2.075			2.104	2.0			10.0	2.099	2.370
1991	3/1/1990			4/1/1991	2.104			2.083	3.0			9.0	2.088	2.383
1992	1/1/1992			1/1/1992	1.606			1.606	12.0			0.0	1.606	3.098
1993	1/1/1992			10/1/1993	1.606			1.606	9.0			3.0	1.606	3.098
1994	10/1/1993			10/1/1993	1.606			1.606	12.0			0.0	1.606	3.098
1995	10/1/1993			10/1/1993	1.606			1.606	12.0			0.0	1.606	3.098
1996	10/1/1993			10/1/1993	1.606			1.606	12.0			0.0	1.606	3.098
1997	10/1/1993			10/1/1993	1.606			1.606	12.0			0.0	1.606	3.098
1998	1/1/1998			1/1/1998	1.558			1.558	12.0			0.0	1.558	3.193
1999	1/1/1998			1/1/1998	1.558			1.558	12.0			0.0	1.558	3.193
2000	1/1/2000			1/1/2000	1.698			1.698	12.0			0.0	1.698	2.930
2001	1/1/2001			1/1/2001	1.766			1.766	12.0			0.0	1.766	2.817
2002	1/1/2002			1/1/2002	1.854			1.854	12.0			0.0	1.854	2.684
2003	1/1/2003			1/1/2003	2.039			2.039	12.0			0.0	2.039	2.440
2004	1/1/2004			1/1/2004	2.243			2.243	12.0			0.0	2.243	2.218
2005	1/1/2005			1/1/2005	2.468			2.468	12.0			0.0	2.468	2.016
2006	1/1/2006			9/1/2006	2.591			2.798	8.0			4.0	2.660	1.870
2007	1/1/2007			1/1/2007	2.902			2.902	12.0			0.0	2.902	1.714
2008	1/1/2007			2/1/2008	2.902			3.059	1.0			11.0	3.046	1.633
2009	2/1/2008			2/1/2009	3.059			3.536	1.0			11.0	3.496	1.423
2010	2/1/2009			2/1/2009	3.536			3.536	12.0			0.0	3.536	1.407
2011	1/1/2011			1/1/2011	3.713			3.713	12.0			0.0	3.713	1.340
2012	1/1/2012			1/1/2012	3.898			3.898	12.0			0.0	3.898	1.276
2013	1/1/2013			1/1/2013	4.093			4.093	12.0			0.0	4.093	1.216
2014	1/1/2014			1/1/2014	4.298			4.298	12.0			0.0	4.298	1.158
2015	1/1/2015			1/1/2016	4.513			4.513	12.0			0.0	4.513	1.102
2016	1/1/2016			1/1/2017	4.738			4.738	12.0			0.0	4.738	1.050
2017	1/1/2017			1/1/2018	4.738			4.738	12.0			0.0	4.738	1.050
2018	1/1/2018			1/1/2019	4.975			4.975	12.0			0.0	4.975	1.000
2019	1/1/2019			1/1/2019	4.975			4.975	12.0			0.0	4.975	1.000
2020	1/1/2020			1/1/2020	4.975			4.975	12.0			0.0	4.975	1.000
Current								4.975					4.975	1.000

Notes:

(1) - (4) Rates in effect and beginning and end of year (B.O.Y. and E.O.Y.)
For each year except 1985, 2006, and 2008 the B.O.Y. and E.O.Y. rates are the only rates applicable
For 1985, there were two additional rate changes
For 2006, there was one additional rate change
For 2008, the rate change took effect mid-year

(5) - (8) Based on Exhibit 10, Sheet 3

(9) - (12) Number of months that each of the rates were effective

(13) = Weighted average of (5) - (8) using (9) - (12) as weights

(14) = Current (13) / (13)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
History of Rate Level Changes

Effective Date	Rate Change	Cumulative Rate Level
(1)	(2)	(3)
Prior		1.000
8/1/80	17.5%	1.175
9/1/81	-3.7%	1.132
9/1/82	26.2%	1.428
10/10/83	6.0%	1.514
3/1/85	25.0%	1.892
3/15/85	28.3%	2.428
11/15/85	9.2%	2.651
7/1/87	-9.2%	2.407
11/1/88	-13.8%	2.075
3/1/90	1.4%	2.104
4/1/91	-1.0%	2.083
1/1/92	-22.9%	1.606
10/1/93	0.0%	1.606
1/1/98	-3.0%	1.558
1/1/00	9.0%	1.698
1/1/01	4.0%	1.766
1/1/02	5.0%	1.854
1/1/03	10.0%	2.039
1/1/04	10.0%	2.243
1/1/05	10.0%	2.468
1/1/06	5.0%	2.591
9/1/06	8.0%	2.798
1/1/07	3.7%	2.902
2/1/08	5.4%	3.059
2/1/09	15.6%	3.536
1/1/11	5.0%	3.713
1/1/12	5.0%	3.898
1/1/13	5.0%	4.093
1/1/14	5.0%	4.298
1/1/15	5.0%	4.513
1/1/16	5.0%	4.738
1/1/17	0.0%	4.738
1/1/18	5.0%	4.975
1/1/19	0.0%	4.975
1/1/20	0.0%	4.975

Notes:

(2) Provided by TWIA, excludes 1/1/92 refund on in-force policies
(3) = Cumulation of (2)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Fixed Expenses and Permissible Loss & LAE Ratios

	Expense Category	2018	2019	2020	Selected
(1)	Direct Written Premium	$395,551,679	$372,016,601	$369,600,488	
(2)	Direct Earned Premium	$409,954,258	$381,571,182	$369,179,093	
(3)	Commission				
	$ Amount	63,280,811	59,474,929	59,103,153	
	% of DWP	16.0%	16.0%	16.0%	16.0%
(4)	Other Acquisition				
	$ Amount	$0	$0	$0	
	% of DWP	0.0%	0.0%	0.0%	0.0%
(5)	General Expense				
	Unadjusted $ Amount	$30,687,177	$31,461,936	$31,624,678	
	Adjustments				
	Contribution to Statutory Fund	0	0	0	
	Adjusted $ Amount	30,687,177	31,461,936	31,624,678	
	% of DEP	7.5%	8.2%	8.6%	8.1%
(6)	Taxes, Licenses & Fees				
	$ Amount	$7,590,295	$7,024,246	$6,904,349	
	% of DWP	1.9%	1.9%	1.9%	1.9%
(7)	Reinsurance Expense				19.7%
(8)	Outstanding Class 1 Public Security Repayment				18.6%
(9)	Total Fixed Expenses				46.4%
(10)	Total Variable Expenses				17.9%
(11)	CRTF Contribution & UW Contingency & Uncertainty				5.0%
(12)	Permissible Loss, LAE, and Fixed Expense Ratio				77.1%

Notes:
(1) - (6) From TWIA's Statutory Annual Statements and Insurance Expense Exhibits
(7) Exhibit 11, Sheet 2
(8) Outstanding Class 1 Public Security issued in 2014, Security depleted due to Hurricane Harvey;
0.186= Annual principal and interest payment $68.9M/Prospective written premium at present rate$373.3M
$373.3M = TWIA 2020 written premium $369.6M*(1+0.5%)^2; 0.5% from Exhibit 11, sheet 2, (3)
(9) = (5) + (7) + (8)
(10) = (3) + (4) + (6)
(11) CRTF contribution selected judgmentally
(12) = 100% - (10) - (11)

Texas Windstorm Insurance Association Exhibit 11
Commercial Property - Wind & Hail Sheet 2
Rate Level Review
Development of Reinsurer Expense
Using Average of AIR and RMS Hurricane Models

		Combined	Residential	Commercial
(1)	2021 - 2022 Reinsurance Premium	97,899,030	81,437,712	16,461,318
(2a)	Average Annual Loss by Reinsurance Layer (AIR)			
	100% of $1930M XS $2100M	31,044,471	25,927,581	5,116,890
	Total	31,044,471	25,927,581	5,116,890
(2b)	Average Annual Loss by Reinsurance Layer (RMS)			
	100% of $1930M XS $2100M	16,660,779	13,804,742	2,914,358
	Total	16,660,779	13,804,742	2,914,358
(2c)	Selected Total Average Annual Loss	23,852,625	19,866,162	4,015,624
(3)	Annual Exposure Growth	0.5%	0.5%	0.5%
(4)	Prospective Average Annual Loss	23,971,888	19,965,492	4,035,702
(5)	Net Cost of Reinsurance	70,331,359	58,477,396	11,820,261
(6)	TWIA 2020 Earned Premium at Present Rates	371,145,817	311,420,426	59,725,391
(7)	2021 - 2022 TWIA Prospective Earned Premium at Present Rates	373,778,124	313,629,138	60,148,986
(8)	Indicated Reinsurance Expense %	18.8%	18.6%	19.7%

Notes:
(1) From TWIA reinsurance contract effective 6/1/2021 through 5/31/2022
(2a) Provided by Guy Carpenter, based on AIR model using TWIA exposures as of 11/30/2020
(2b) Provided by Guy Carpenter, based on RMS model using TWIA exposures as of 11/30/2020
(2c) Selected equal to the average of the modeled average annual losses
(3) Selected based on projections communicated to reinsurers
(4) = (2c) * [(1+ (3)) ^ 1.000](projected exposure growth from 11/30/2020 to 12/1/2021)
(5) = (1) - (4)*1.15,1.15 is the loading for loss adjustment factor
(6) = Commercial Exhibit 10, Sheet 1 + Residential Exhibit 10, Sheet 2, calendar year ending 12/31/2020
(7) = (6) adjusted for exposure growth trend * [(1+ (3)) ^ 1.417] (projected exposure growth from 7/1/2020 to 12/1/2021)
(8) = (5) / (7)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Reconciliation of Paid Loss Data to Schedule P

Accident Year	TWIA Provided Paid Loss Commercial & Farm	Residential	Total	Schedule P Direct & Assumed Paid Loss	Difference
(1)	(2)	(3)	(4)	(5)	(6)
2008	857,250,899	1,709,217,229	2,566,468,128	2,562,744,000	3,724,128
2009	2,553,456	8,479,585	11,033,041	10,403,000	630,041
2010	7,478,289	10,958,718	18,437,007	18,005,000	432,007
2011	19,217,587	76,982,393	96,199,980	96,073,000	126,980
2012	14,459,642	52,336,910	66,796,552	66,741,000	55,552
2013	7,351,329	63,510,141	70,861,470	70,810,000	51,470
2014	1,056,281	6,114,259	7,170,540	7,002,000	168,540
2015	18,672,896	119,987,507	138,660,403	138,675,000	(14,597)
2016	2,596,505	25,912,370	28,508,875	28,417,000	91,875
2017	457,095,865	920,768,737	1,377,864,602	1,377,918,000	(53,398)
2018	237,951	11,893,933	12,131,884	11,996,000	135,884
2019	874,585	15,798,628	16,673,213	16,845,000	(171,787)
2020	4,708,280	41,647,751	46,356,031	45,888,000	468,031
Total	1,393,553,565	3,063,608,161	4,457,161,726	4,451,517,000	5,644,726

Notes:

(2), (3) Provided by TWIA, as of 12/31/2020
(4) = (2) + (3)
(5) Based on TWIA 2020 Annual Statement
(6) = (4) - (5)

Texas Windstorm Insurance Association
Commercial Property - Wind & Hail
Rate Level Review
Reconciliation of Premium Data to Annual Statement

Calendar Year	TWIA Provided Written Premium			Annual Statement Gross Written Premium	Difference
	Commercial	Residential	Total		
(1)	(2)	(3)	(4)	(5)	(6)
1994	10,672,677	15,758,330	26,431,007	26,510,501	(79,494)
1995	12,865,905	19,259,265	32,125,170	32,419,287	(294,117)
1996	15,640,660	24,504,127	40,144,787	40,358,575	(213,788)
1997	16,536,186	25,783,455	42,319,641	42,462,844	(143,203)
1998	16,558,977	27,833,800	44,392,777	44,410,914	(18,137)
1999	17,394,142	27,168,992	44,563,134	44,581,218	(18,084)
2000	17,332,561	29,762,296	47,094,857	48,012,426	(917,569)
2001	17,544,251	36,220,623	53,764,874	54,630,727	(865,853)
2002	24,013,525	48,856,422	72,869,947	72,967,831	(97,884)
2003	29,220,514	58,573,191	87,793,705	87,987,279	(193,574)
2004	31,009,323	71,292,702	102,302,025	102,384,351	(82,326)
2005	35,740,174	78,094,458	113,834,632	113,927,701	(93,069)
2006	76,847,840	119,658,576	196,506,416	196,833,235	(326,819)
2007	110,951,718	203,561,196	314,512,914	315,139,307	(626,393)
2008	98,036,118	232,925,990	330,962,108	331,057,645	(95,537)
2009	111,269,573	269,535,059	380,804,632	382,342,402	(1,537,770)
2010	102,174,680	278,116,922	380,291,602	385,549,582	(5,257,980)
2011	100,017,021	307,494,236	407,511,257	403,748,164	3,763,093
2012	110,524,397	335,795,725	446,320,122	443,479,701	2,840,421
2013	112,904,624	360,838,081	473,742,705	472,739,474	1,003,231
2014	104,642,688	389,333,918	493,976,606	494,036,010	(59,404)
2015	98,715,934	407,969,846	506,685,780	503,824,316	2,861,464
2016	88,278,690	399,074,847	487,353,537	487,353,537	-
2017	70,749,081	352,368,052	423,117,133	423,074,138	42,995
2018	65,696,833	331,676,957	397,373,790	395,551,679	1,822,111
2019	59,123,729	314,907,159	374,030,888	372,016,601	2,014,287
2020	60,327,052	310,312,753	370,639,805	369,600,488	1,039,317
Total	1,614,788,872	5,076,676,978	6,691,465,850	6,686,999,933	4,465,917

Notes:

(2), (3) Provided by TWIA, as of 12/31/2020

(4) = (2) + (3)

(5) Based on TWIA Annual Statements

(6) = (4) - (5)