

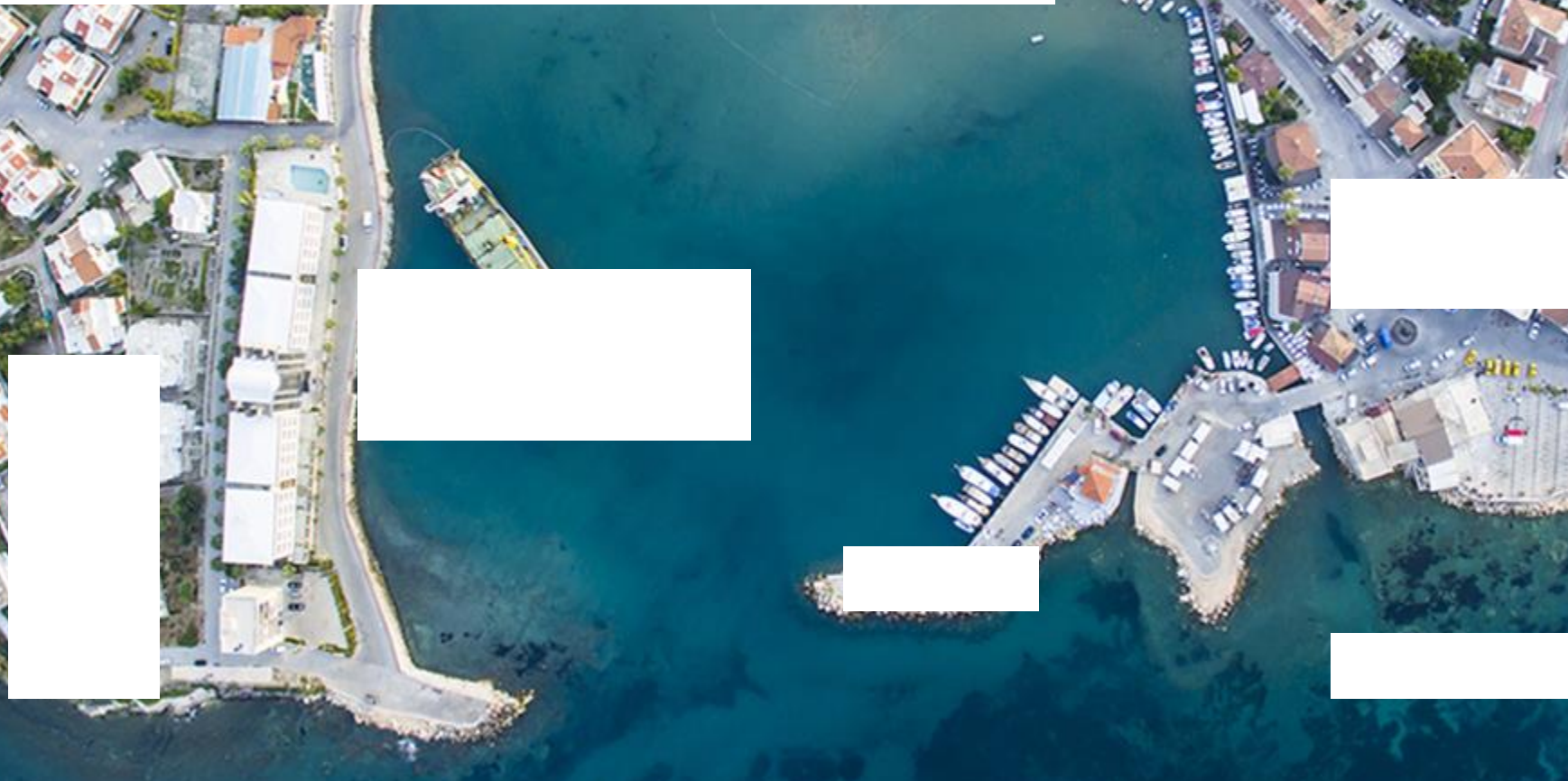
Rate Indications

Board of Directors Meeting

December 8, 2020



TEXAS WINDSTORM
INSURANCE ASSOCIATION



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Reminder on WTW Report dated September 4, 2020

- 67 page report delivered to the Committee on September 4, 2020

Recommendation Summary

	Current	Recommendation
RMS / AIR Blend	50% / 50%	75% / 25%
Hurricane LAE	15%	17.20%
Model View	Near Term	Long Term
Storm Surge	Included (<i>Hu Loss Ratio Only</i>)	Excluded
Reinsurance Cost	Not Allocated by LOB	Allocated to Residential & Commercial
Residential Indication		32%
Commercial Indication		42%

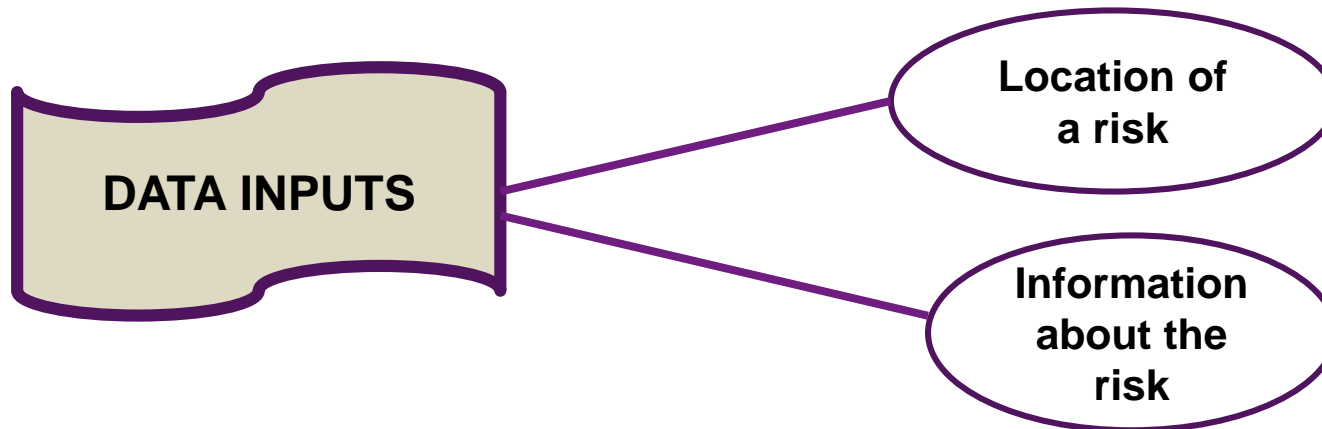
- Data quality initiative
 - WTW Sensitivity Analysis (pg 29-35)
- This engagement is not related to any analysis of the TWIA rating plan

Prompted follow up
WTW study

Preface

- What is *DATA QUALITY*?
- Why is data quality important in the reinsurance buying process?
- Define modeling terminology
 - Primary risk characteristics
 - Secondary modifiers

Why is data quality important?



- If you don't tell the catastrophe model about a risk, it will make assumptions based on industry data = "unknown"
- Example: For Opening Protection, RMS assumes 60% of homes built pre-2002 have "*no exterior openings have wind-borne debris protection.*"
 - TWIA underwriting guidelines for the Seaward & Inland 1 regions suggest this default assumption may not give enough recognition for homes built with opening protection
- Models are calibrated using industry data, so using TWIA-specific data will lead to results more reflective of TWIA underlying risk

Why is data quality important for TWIA's reinsurance purchase?

- In its simplest form, all reinsurers will follow the same process when reviewing TWIA's reinsurance program
 - Every reinsurer has a different approach or view of risk, but the process is the same
- Step 1: Receive exposure data from TWIA / Broker. No adjustments to the exposure data
- Step 2: Model in RMS and AIR using broker provided files; reinsurers can “plug” files from broker into RMS & AIR models
- Step 3: Make qualitative adjustments: view of risk, claims handling, model weights, historical claims, territorial adjustments, LAE, etc.
- Step 4: Develop a price for the TWIA reinsurance program

What Data Inputs Impact Catastrophe Models?

Primary Characteristics

Primary Characteristics	Residential		Commercial	
	RMS	AIR	RMS	AIR
Coverage Amount	Y	Y	Y	Y
Location	Y	Y	Y	Y
Construction	Y	Y	Y	Y
Year Built	Y	Y	Y	Y
Occupancy	Y	Y	N	N
Sq footage	Y	Y	Y	
Height / # stories	Y		Y	Y

Y = TWIA originally provided to WTW in Sept 2020

N = Not originally provided to WTW in Sept 2020

Secondary Risk Characteristics

RMS Modifiers for Wind-Only

Cladding Type
Commercial Appurtenant Structures
Construction Quality
Flashing and Coping Quality
Frame-Foundation Connection
Ground-Level Equipment
Opening Protection
Residential Appurtenant Structures
Roof Age and Condition
Roof Anchors
Roof Covering
Roof Equipment Hurricane Bracing
Roof Geometry
Roof Sheathing Attachment

AIR Modifiers for Wind-Only

Appurtenant Structures
Building Condition
Building Foundation Connection
Exterior Doors
Glass Percentage
Glass Type
Large Missile
Roof Anchorage
Roof Attached Structures
Roof Cover Attachment
Roof Covering
Roof Deck
Roof Deck Attachment
Roof Geometry
Roof Pitch
Roof Year Built
Seal of Approval
Small Debris
Terrain Roughness
Tree Exposure
Wall Attached Structures
Wall Type
Window Protection
Wall Siding

- TWIA has not been modeling with any “secondary” risk characteristics for rate making or reinsurance
- As you will see, TWIA’s 1-100 yr PML and reinsurance costs have been inflated

Output of Data Quality Project



Data Collection Process & Sources

TWIA's System (data warehouse)

TWIA Class Code
Structure Condition
Roof Year
Building Code Credits &
Standards Built

Eagle View Data

Roof Condition
Roof Material
Roof Style
Tree Overhang

WPI-8 Data

Type of Inspection
(Roof/Openings)
Certification Date
Location: Inland / Seaward
Building Code (IRC, IBC...)
Engineered (Y or N)

Highlights of Data Extraction

- Over 10,000 risks believed to be single family homes were actually condo / apartment risks (lower loss cost)
- Occupancy: approx. 23% of Commercial risk were re-categorized as other than General Commercial (Multi-Family Dwelling (Condos, Homeowners Association, Education, Religion & Non Profit)
- Hurricane rated roof covering: 50,595 locations that previously modeled as “unknown”
- Roof year: 60% is post 2008 (Hurricane Ike)
- Location credit for building code: 39,937 insureds obtained this credit yet TWIA didn't get a credit on reinsurance
- WPI-8 Roof – 21,927 locations have a WPI-8 certified roof; avg certification of Sept. 2009 (1 year after Hurricane Ike)
- WPI-8 Engineered: 17,463 locations are certified with engineered construction yet previously modeled as “normal”

Key Secondary Modifiers Captured by WTW Project

RMS Modifiers for Wind-Only

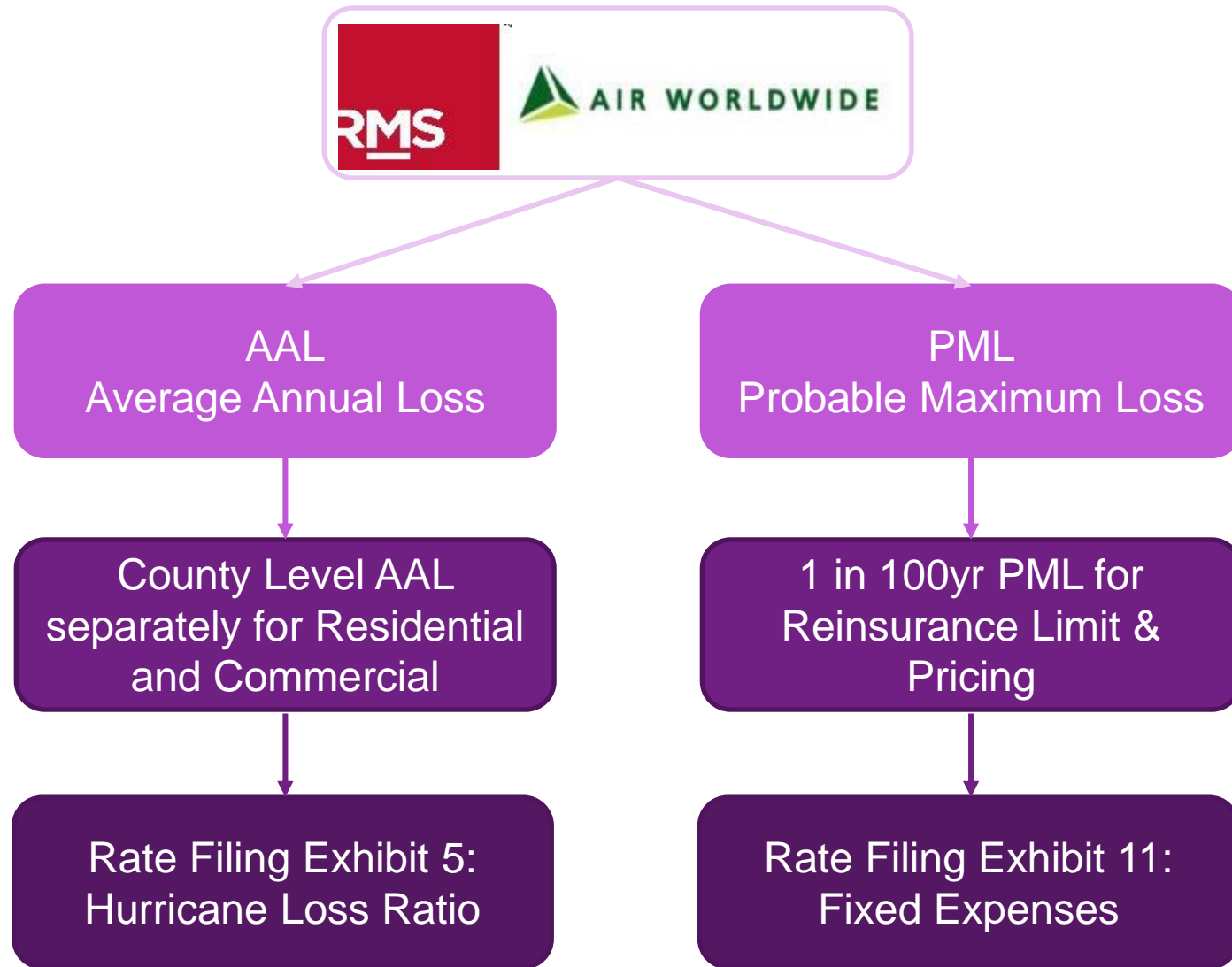
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- Secondary modifiers highlighted in **green** are newly captured through this WTW data quality project
- WTW reviewed information from the 3 data sources together with TWIA staff to determine appropriate mappings for modeling
- Outcome: 5 secondary modifiers in RMS and 6 in AIR
 - versus 0 before
- Additional work should serve to further reduce rate indication / reinsurance costs

Catastrophe Model uses in Rate Filing



Modeled Average Annual Loss

- Modeled hurricane loss ratio; 75% / 25% weighting with RMS / AIR
- WTW “Original” project in September 2020
 - Residential: 52.6% loss ratio
 - Commercial: 61.2% loss ratio
- WTW “Revised” project December 2020
 - Residential: 49% loss ratio
 - Commercial: 59.8% loss ratio

Hurricane only modeled loss, excluding LAE. See WTW rate indication for additional information

Impact of Data Quality on TWIA's Reinsurance Expense & 1-100 Year PML

	Column A	Column B	Column C	B - A	C - B	C - A
Cat models- reinsurance & rate indication						
Metric	TWIA's Current Approach ³	WTW Recommendation Pre-Data Quality "Original"	WTW Recommendation With Data Quality "Revised"	TWIA Current Approach vs WTW Recommendation Pre-Data Quality "Original"	Pre-Data Quality vs With Data Quality Original vs Revised	Pre-Data Quality vs With Data Quality Revised vs TWIA Current
Model Weight (RMS/AIR)	50% / 50%	75% / 25%	75% / 25%			
1-100 yr (11/30/19 data)	3,600,000,000	3,180,000,000	2,997,136,072	(420,000,000)	(182,863,928)	(602,863,928)
LAE Load	15.00%	17.20%	17.20%	2.20%	0.00%	2.20%
1-100 yr w/ LAE (rounded)	4,200,000,000	3,740,000,000	3,515,000,000	(460,000,000)	(225,000,000)	(685,000,000)
Assumed Reinsurance Limit (2020)	2,100,000,000	1,640,000,000	1,415,000,000	(460,000,000)	(225,000,000)	(685,000,000)
Assumed Reinsurance Retention (2020)	2,100,000,000	2,100,000,000	2,100,000,000			
2020 Net Reinsurance Spend \$ ⁴	102,066,436	85,227,815	76,000,000	(16,838,621)	(9,227,815)	(26,066,436)

³This figure represents the methodology TWIA is currently using and the actual limit purchased.

⁴ Current Net Spend = 107,500,000 gross spend less broker discount, depopulation policies and applicable commissions. See Indication Exhibit 11.2

- Willis Re data quality project has reduced the 1-100 yr PML by \$225M and reduced reinsurance expense by \$9.2M vs the original recommendation
- Based on WTW report and supplementary data, TWIA purchased \$685M excess reinsurance limit in 2020, which cost \$26M (assumptions approved by TWIA staff)

Impact of Data Quality on TWIA's Reinsurance Expense & 1-100 Year PML

50% / 50% Weight on catastrophe models (versus WTW recommendation)

	Column A	Column B	B - A
Cat models- reinsurance and rate filings			
Metric	TWIA's Current Approach ³	WTW Recommendation With Data Quality "Revised"	Pre-Data Quality vs With Data Quality Revised vs TWIA Current
Model Weight (RMS/AIR)	50% / 50%	50% / 50%	
1-100 yr (11/30/19 data)	3,600,000,000	3,312,170,236	(287,829,764)
LAE Load	15.00%	17.20%	2.20%
1-100 yr w/ LAE (rounded)	4,200,000,000	3,880,000,000	(320,000,000)
Assumed Reinsurance Limit (2020)	2,100,000,000	1,780,000,000	(320,000,000)
Assumed Reinsurance Retention (2020)	2,100,000,000	2,100,000,000	
2020 Net Reinsurance Spend \$ ⁴	102,066,436	89,874,436	(12,192,000)

³This figure represents the methodology TWIA is currently using and the actual limit purchased.

⁴ Current Net Spend = 107,500,000 gross spend less broker discount, depopulation policies and applicable commissions. See Indication Exhibit 11.2

- Even if TWIA didn't initiate WTW approach of 75% / 25% cat models, the data quality project would still provide a significant financial benefit to TWIA & its policyholders
 - 50% / 50% model weight scenario, Willis Re data quality project reduces the 1-100 yr PML by \$320M and reduces reinsurance expense by \$12.2M

WTW Summary of Rate Indications

	Current	WTW "Original" Output	WTW "Revised" Output w/ Data Quality
Delivery Date		22-Sep-20	1-Dec-20
Residential:		+32%	+26%
Commercial:		+42%	+44%
Reinsurance Expense \$*:	102,066,436	85,227,815	76,000,000

**Current Net Spend = 107,500,000 gross spend less broker discount, depopulation policies and applicable commissions. See Indication Exhibit 11.2*

- **WTW “Original”** Sept 2020 report with recommendations on model selections, LAE, storm surge
- **WTW “Revised”** “Original” + the addition of improved data quality
- All reinsurance cost assumptions approved by TWIA staff
- All detailed information can be found in the rate indication exhibits

Summary

- WTW initiated this data quality project which proved to be financially beneficial to TWIA, insureds, and all stakeholders
- All “new” data was previously available to TWIA and reinsurance advisors
- Over 43 business days, WTW has:
 - Worked with TWIA staff to gather risk elements from various existing sources
 - Improved accuracy of rate filing loss cost
 - Reduced 1-100 year PML by \$225M, which also reduces annual reinsurance cost by an additional \$9.2M, absent market conditions
 - Reinsurance cost reduction of “Current” vs “Revised” = \$26M, or 25.5%

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