

# AIR Worldwide

Prepared for Florida Commission Professional Team



# REVISED FORMS TO ADDRESS SECONDARY MODIFIERS MISMATCH

# Overview of Set process for 2011 and Creating Revised Forms

This is the process we used to prepare for the 2011 Submission

Since the 2011 Actuarial forms were revised, we decided to start fresh with our entire process

- For Forms A-2, A-3, A-4, A-5, A-8, we re-created input data files and re-created the Forms using v12.0.4 and matched them to the 2009 Submission
- For Forms A-1, A-6 and A-7, we created the new 2011 data input files and Forms using v12.0.4
- Finally, we created all Forms using v14.1

# List of Forms under 2011 ROA Standards

Please find the forms under 2011 ROA Standards listed on the following table:

Form	Source data	Notes
Form A-1: Zero Deductible Personal Residential Loss Costs by ZIP Code	NotionalInput11.xlsx (Notional Set 3)	
Form A-2: Base Hurricane Storm Set Statewide Loss Costs	hlpm2007com.txt (2007 FHCF data)	64 mismatch found
Form A-3: Cumulative Losses from the 2004 Hurricane Season	hlpm2007com.txt (2007 FHCF data)	64 mismatch found
Form A-4: Output Ranges	hlpm2007com.txt (2007 FHCF data)	
Form A-5: Percentage Change in Output Ranges	hlpm2007com.txt (2007 FHCF data)	
Form A-6: Logical Relationship to Risk	NotionalInput11.xlsx	
Form A-7: Percentage Change in Logical Relationship to Risk	NotionalInput11.xlsx	
Form A-8: Probable Maximum Loss for Florida	hlpm2007com.txt (2007 FHCF data)	64 mismatch found
Form S-2: Example of Loss Exceedance Estimates	hlpm2007com.txt (2007 FHCF data)	64 mismatch found
Form S-5: Average Annual Zero Deductible Statewide Loss Costs - Historical versus Modeled	hlpm2007com.txt (2007 FHCF data)	64 mismatch found

# Process for discovering the Secondary Modifiers Mismatch

This is how we discovered the mismatch in the A-2, A-3, A-8, S-2 and S-5 data input file:

1. We used SQL to create the UPX based on 2011 ROA instructions
2. We analyzed this data in CLASIC/2 v12.0.4 for Form A-2
3. We compared the results and they did not match to the 2009 submission A-2 exhibit
4. We imported the 2009 UPX into SQL and tested the differences between our UPX
  - a. The data looked consisted because the Replacement Values, Insured Values, Deductible Values and Risk Counts all matched between the UPXs
  - b. We conducted the comparisons by Line of Business, by County, and by Construction/Occupancy and Year Built
  - c. Then we took the same contract records (i.e. policy, location and secondary characteristics) from each UPX to compare the v12.0.4 losses and they did not match
  - d. We noticed that the secondary characteristics were inconsistent

# Process for discovering the Secondary Modifiers Mismatch (Continued)

- We concluded that the 64 records in the UPX from the 2009 submission were incorrectly match with the 60 and 63 records.

We were unable to locate the final SQL script used to prepare the UPX for the 2009 submission. It is likely that this UPX was created for the first submission where the HLPM2007c.exe data was used and has been used for each subsequent submission without alteration.

2009 UPX										
RecordType	PolicyID	LocationID	Name	Address	UDF1	UDF2	State_FIP	County_FI	ZIP_Code	
60	HO_32118_2002_111_42834	42834	X	X	X	X	X	X		USER
63	HO_32118_2002_111_42834	42834	X	X	X	1003	12	127	32118	
64	HO_32118_2002_111_42834	42834		0	0	0	0	0	0	0
2011 UPX										
60	HO		0 X	X	X	X	X	X		USER
63	HO	HO_111_Zero_32118_63593	X	X	X	1003	12	127	32118	
64	HO	HO_111_Zero_32118_63593	X		0	0	0	0	0	0

Spreadsheet: [UPX\\_A2\\_Investigation.xlsx](#)

# Impact of the Secondary Modifiers Mismatch

This is the impact of the mismatch on each Form except for Form A-3:

Forms	Submitted (in Billions)	Redo
A-2 Historical Personal Residential AAL Loss	2.837	2.937
A-2 Historical Commercial Residential AAL Loss	0.588	0.553
A-8 Personal Total Loss	3.623	3.745
A-8 Personal and Commercial Total Loss	4.350	4.439
S-2 FHCF Personal Loss (Total AAL)	3.623	3.745
S-2 FHCF Personal and Commercial Loss (Total AAL)	4.35	4.439
S-5 Personal Historical	2.838	2.937
S-5 Personal Model	3.623	3.745
S-5 Personal and Commercial Historical	3.477	3.490
S-5 Personal and Commercial Model	4.35	4.439

\*The 64 mismatch error is only found in the Personal Residential UPX. The mismatch is not found in the Commercial Residential UPX.

Submitted and Revised Forms:

- [Submitted 2009 Forms](#) and [AIR 2009 FCHLPM Submission 20101103](#)
- [Revised 2009 Forms](#)



# Update on Form S-5: Average Annual Zero Deductible Statewide Loss Costs – Historical versus Modeled

This is a table of the Average Annual Zero Deductible Statewide Personal and Commercial Residential Loss Costs calculated by AIR on Form S-5.

Time Period	Historical Hurricanes (in Billions)	Produced by Model (In Billions)
Submitted Ground-up Losses with 10% Storm Surge included in Historical Commercial AAL	3.477	4.350
Redo Ground-up Losses with 10% Storm Surge included in Historical Commercial AAL	3.753	4.713
Redo Gross Losses with no Storm Surge included in Historical Commercial AAL	3.490	4.439

Gross Losses with no Storm Surge in Historical Commercial AAL are use for current submission under 2011 ROA standards.



# Calculation of Ground-up and Zero Deductible Gross Loss

- This slide explains the reason for the difference in the AIR model between
  1. Ground-up losses
  2. Zero deductible Gross losses
- In AIR's response to Standard A-4 (pg.126), the Expected Insured Loss is calculated based on the formula below:

$$\text{Expected Insured Loss} = \int_{x=0}^1 f_{\overline{D}}(x) \max\{0, \text{Coins}\% * [\min(x * \text{RV}, \text{PL}) - \text{DED}]\} dx$$

where

Coins%	=	Coinsurance Percentage
RV	=	Replacement Value
PL	=	Policy Limit
DED	=	Deductible
x	=	Random Variable for Damage Ratio

In application,  $f_{\overline{D}}(x)$  is discretized and numerical integration is used to estimate the expected insured loss.

- When Form S-5 Personal and Commercial Ground up AAL (4.713) is calculated, the damage rate is applied to Replacement Value and demand surge, no limits are applied
- When Form S-5 Personal and Commercial Gross AAL (4.439) is calculated, the policy conditions are considered, i.e. limits and deductibles
- For ground up scenario, in the case of a full or near-full loss including demand surge,  $x*RV$  can be  $> RV$
- However, for zero deductible gross,  $x*RV$  will be capped at the Limit