

## Florida Hurricane Catastrophe Fund

Midwestern Actuarial Forum  
September 19, 2011  
Saint Paul, Minnesota

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## 2011 FHCF Premium Formula: Rates, Retention Multiples, and Payout Multiples

Andy Rapoport, Managing Director and Actuary, Paragon



Hurricane Wilma

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## FHCF Ratemaking

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## Overview

- What's New?
- Balance: Funds Needed vs. Funds Sources
- Ratemaking Process
- Summary of Premium & Rate Changes

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## What's New?

- 15% Cash Build-Up Factor included in rates
  - 10% in 2010
- Quadruple TICL Premium
  - 3x in 2010
- TICL Limit reduced to \$6 billion
  - \$8 billion in 2010
- New construction classes for commercial, tenants, and condominium owners
  - Masonry or Superior with reinforced concrete roof-deck

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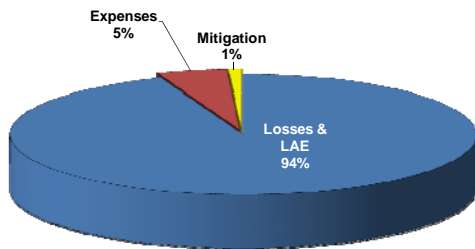
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## Balance: What does the FHCF Pay For?



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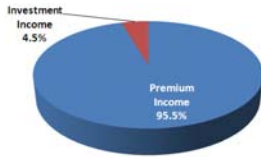
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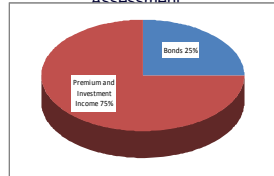
## Balance: Sources of FHCF Funds

- Expected Funding comes from:
  - Premium Income
  - Investment Income



- Post Hurricane Funding (2004 & 2005 combined):

- Bonding: Post Event Assessment




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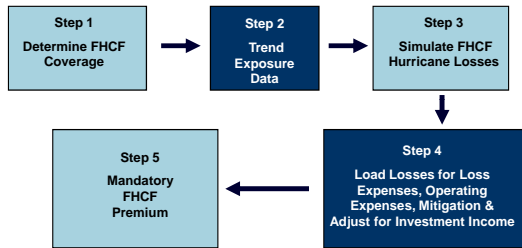
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## Ratemaking Process: Overview of Steps



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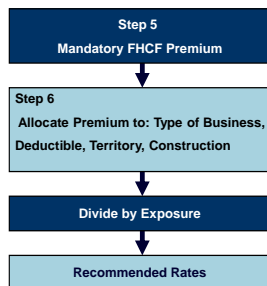
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## Ratemaking Process: Overview of Steps



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## Ratemaking Process: Step 1 – Industry Mandatory FHCF Coverage

- Limit
  - Set by CS for SB 1460 at \$17 billion until there are sufficient resources for two seasons, limited to annual growth in the cash balance
- Industry Retention
  - Based on growth in reported exposures, projected to be \$7.369 billion for current Contract Year

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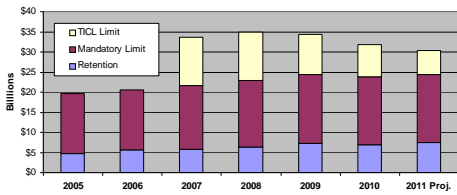
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## Ratemaking Process: Step 1 – Industry FHCF Coverage

(SB)	2005	2006	2007	2008	2009	2010	2011 Proj.
Retention	4,667	5,627	5,785	6,377	7,204	6,883	7,369
Mandatory Limit	15,000	15,000	15,845	16,530	17,175	17,000	17,000
TICL Limit	0,000	0,000	12,000	12,000	10,000	8,000	6,000

FHCF Coverage



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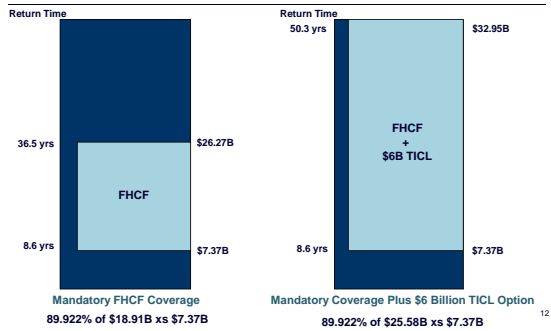
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## Temporary Increase in Coverage Limit (TICL)



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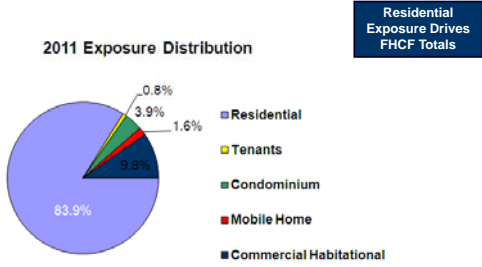
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## Ratemaking Process: Step 1 – Industry Traditional FHCF Coverage



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## Ratemaking Process: Step 1 – Company FHCF Coverage

FHCF Premium  
Payout Multiple  
Retention Multiple



Used to  
Calculate  
Individual  
Company's  
FHCF Coverage

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## Ratemaking Process: Step 1 – Company FHCF Coverage

FHCF Industry Coverage: \$17.000B xs \$7.369B

- Retention drops to 33% on 3<sup>rd</sup> largest event



**Company Limit =**  
FHCF Premium x Payout Multiple  
i.e., \$100M x 14.3923

**Company Retention =**  
FHCF Premium x Retention Multiple  
i.e., \$100M x 6.2332

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Ratemaking Process:  
Step 2 – Trend Exposure Data

Type of Business	Assumed Trends	Projected 2011 Exposure (\$B)
Commercial	0.0%	210.78
Residential	0.0%	1,813.13
Mobile Home	0.0%	35.59
Tenants	0.0%	17.24
Condominiums	0.0%	83.67
<b>Total</b>	<b>0.0%</b>	<b>2,160.41</b>

Sent to Catastrophe Modelers

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Ratemaking Process:  
Step 2 – Trend Exposure Data

- 5 Accepted Hurricane Models
  - AIR Worldwide Corporation (AIR)
  - Applied Research Associates (ARA)
  - EQECAT (EQE)
  - Florida Public Hurricane Loss Model (FPM)
  - Risk Management Solutions Inc. (RMS)

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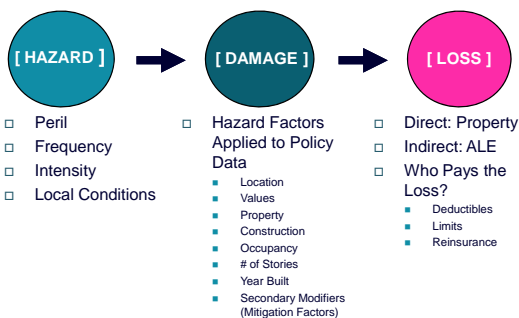
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Ratemaking Process:  
Step 3 – Simulate FHCFC Hurricane Losses (Modeling Overview)



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## Hazard = HURRICANE

- Path
- Central Pressure Difference
- Radius to Maximum Winds
- Surface Roughness
- Wind Models
  - Filling Rate (How fast does it decay?)
  - Wind Field Model (Windspeeds away from eye)
  - Wind Profile (Gradient windspeeds)



Hurricane Wilma

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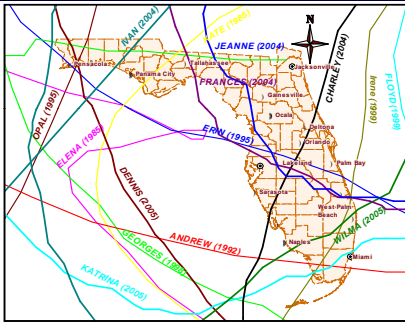
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## Hazard: Hurricane Tracks



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## Damage: Data Required

- Policy Structure
  - Limits by coverages
  - Deductibles
- Individual Risk Characteristics
  - Type of Business
  - ZIP Code
  - Construction

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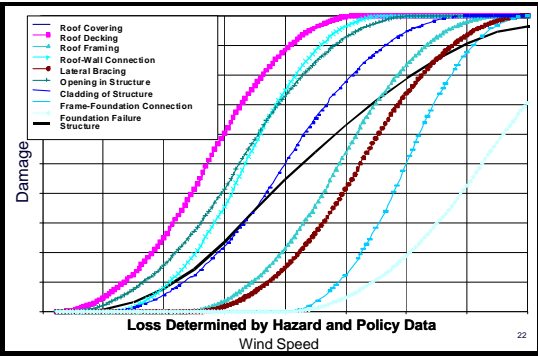
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## Damage: Calculation




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## Modeling Results

\$ in billions

	2010	2011	% Change
Modeled Exposure	\$2,238	\$2,160	-3.5%
Gross Losses	\$3.493	\$3.390	-2.9%
FHCF Layer Losses	\$1.021	\$0.953	-6.7%
Loss Cost per \$1,000	0.4562	0.4412	-3.3%

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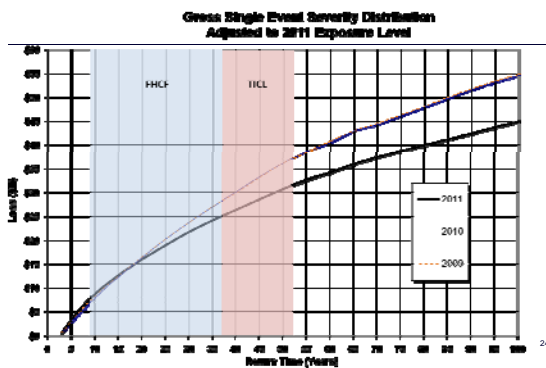
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## Gross Losses




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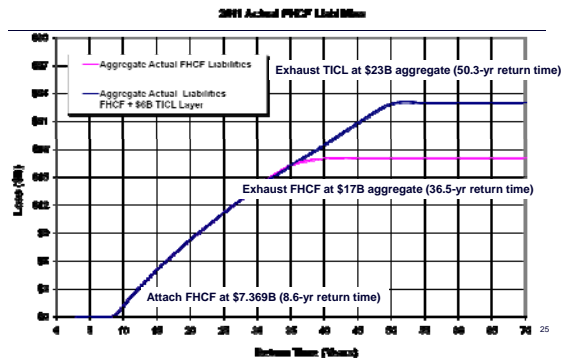
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## FHCF Losses




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## Ratemaking Process: Step 4 – Loadings

- Post-Model Adjustments +\$48.4M
- Operating Expenses +\$7.8M
- Multiple Deductible Reimbursement +\$0.04M
- 2007A Notes Expense +\$37.8M
- Investment Income Credit **-\$45.6M**
- Mitigation Funding +\$10M
- 10% Cash Build-Up Factor +\$154.1M

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## Post-Model Adjustments & Operating Expenses

- Post-Model Adjustments
  - Used to account for special insurance coverages & other factors not projected by models
  - 2011 Selection 5% or \$48.4M
- Operating Expenses
  - Day to day costs of FHCF
  - 2011 Selection \$7.8M

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## Multiple Deductible Reimbursement

- \$44.6M appropriated from FHCF in 2005
  - FHCF recoups funds and interest over 5-year period
  - 2011 Charge \$38,187 (final recoupment)

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## 2007A Notes Expense

- Additional expense incurred in 2007 to increase liquidity (cash) for the FHCF
  - Difference between interest payments to note holders and investment income on note proceeds
  - Lost investment income
  - 2011 Charge \$37.8M

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## Investment Income Credit

- Recognizes that the FHCF generally holds funds several years before payout
- Investment income reduces the premium required
- 2011 Investment Income Credit = **\$45.6M**

	Interest Rate Assumption	Return Time	Investment Credit
2007 Rating Year	3.50%	4 yrs	10.97%
2008 Rating Year	3.50%	4 yrs	11.04%
2009 Rating Year	3.00%	4 yrs	8.40%
2010 Rating Year	2.50%	4 yrs	7.38%
2011 Rating Year	1.50%	4 yrs	4.48%

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## Mitigation Funding

- Rates produced assuming \$10M
- Funding can range from \$10M to 35% of prior year's investment income

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## Cash Build-Up Factor

- The passage of CS/CS/CS/HB 1495 in 2009 by the Florida Legislature imposed an escalating Cash Build-Up Factor on the mandatory premium

Year	Cash Build-Up Factor	Amount
2009	5%	\$51.3M
2010	10%	\$101.0M
2011	15%	\$154.1M
2012	20%	
2013	25%	

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## Ratemaking Process: Step 5 – Overall FHCF Premium

	FHCF	TICL (\$6B)	FHCF + TICL
2010 Premium	\$1,111M	\$454M	\$1,565M
2011 Premium	\$1,181M	\$568M	\$1,749M
% Change	+6.3%	+25.1%	+11.8%

**Notes:**

Assumes 100% of TICL is purchased at \$6B level  
 FHCF premiums include Cash Build-Up Factor (10% for 2010, 15% for 2011)  
 TICL premiums include TICL factor (3x for 2010, 4x for 2011)

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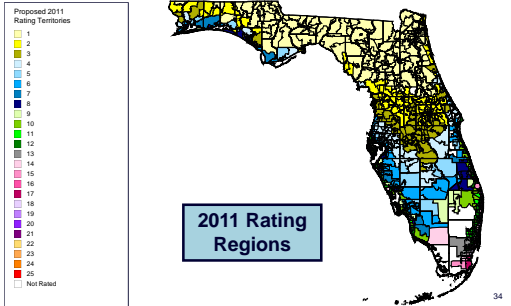
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## Ratemaking Process: Step 6 – Allocating Loss




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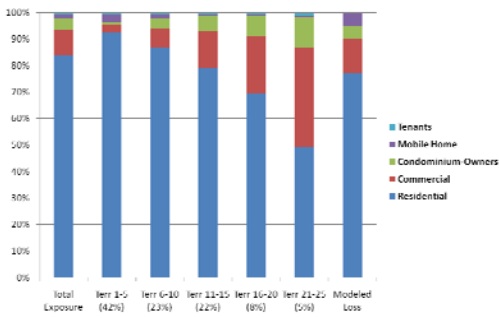
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## Ratemaking Process: Step 6 – Allocating Loss




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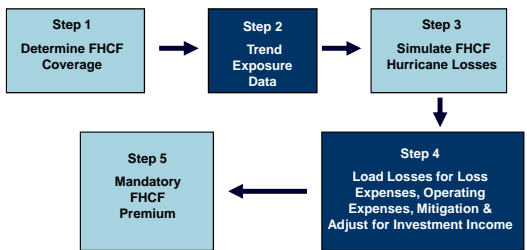
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## Recap of Ratemaking Steps




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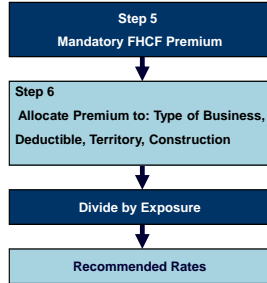
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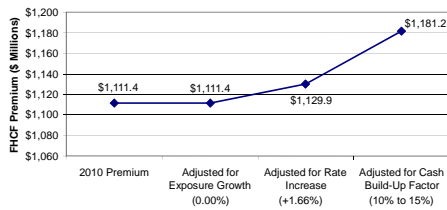
## Recap of Ratemaking Steps



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## Summary: Overall Mandatory FHCF Premium

Components of 2011 Mandatory Premium Change  
(+6.28%)



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## Summary: Overall Indications

### Rate Changes by Type of Business

Type of Business	FHCF Layer		FHCF + \$6B TICL Layer
	(No change to Cash Build-Up*)	(Per Statute*)	
Residential	2.29%	6.94%	12.49%
Tenants	-4.01%	0.35%	5.58%
Condominiums	4.15%	8.88%	14.53%
Mobile Home	7.00%	11.87%	17.67%
Commercial Habitational	-4.00%	0.36%	5.57%
<b>Total Rate Change</b>	<b>1.66%</b>	<b>6.28%</b>	<b>11.79%</b>

\* Cash Build-Up Factor for 2010 was 10%; for 2011 it is 15%

## Windstorm Mitigation Construction Factors

- In addition to construction, structural characteristics that are being reported and estimated to have a material impact on modeled losses are incorporated as mitigation rating variables.
- 2011 rating variables used:
  - Year Built
  - Structure Opening Protection
  - Roof Shape
- Roof-Deck Attachment moved to be a construction classification for current Contract Year.

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## Mitigation Construction Factor Relativities

To Calculate the Final FICF Rate for a risk:

Preliminary relativity = (year built relativity) x (roof shape relativity) x (opening protection relativity)  
 Capped relativity = 1.2 if the preliminary relativity exceeds 1.2; or  
 0.8 if the preliminary relativity is less than 0.8; or  
 the preliminary relativity in all other cases. **20% cap in 2011**  
 Actual relativity = the smaller of the capped relativity and (1 - BCEG credit) if the BCEG credit exceeds 0%; or  
 the capped relativity if the BCEG credit equals 0%.  
 Final rate = (Base rate) x (actual relativity) x (on balance relativity)

Relativity	Construction Feature	Description	Type of Business				
			Commercial	Residential	Home	Tenants	Condos
Year Built Relativity	Meets 2001 FBC* or Does not Meet 2001 FBC	2002 or later	0.6554	0.7098	1.0000	0.5967	0.6416
		Unknown or Mobile Home	1.0177	1.0620	1.0000	1.0676	1.0469
		Pre 1995 and 1995-2001	1.1317	1.1678	1.0000	1.2137	1.1701
Roof Shape Relativity	Roof Shape	Hip, Mansard, or Pyramid	0.8412	0.8543	1.0000	0.7438	0.7680
		Gable, Other or Unknown	1.0394	1.0926	1.0000	1.0301	1.0305
Opening Protection Relativity	Opening Protection	No Credit Given by Insurer	1.3509	1.0898	1.0000	1.0495	1.0597
		Credit Given by Insurer	0.8593	0.8393	1.0000	0.6927	0.7806
On Balance Relativity			0.9541	0.9869	1.0000	0.9837	0.9933

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## Temporary Increase in Coverage Limit (TICL)

Multiply published FICF rates by the premium adjustment factor for the selected TICL limit level

TICL Limit	Coverage Provided	Premium Adjustment Factor
\$1,000,000,000	\$18,000B xs \$7.369B	1.0914
\$2,000,000,000	\$19,000B xs \$7.369B	1.1776
\$3,000,000,000	\$20,000B xs \$7.369B	1.2594
\$4,000,000,000	\$21,000B xs \$7.369B	1.3372
\$5,000,000,000	\$22,000B xs \$7.369B	1.4108
\$6,000,000,000	\$23,000B xs \$7.369B	1.4811

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FHCF Reserving

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FHCF Reserving



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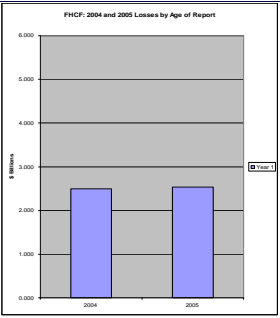
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Contract Years Comparison:  
FHCF Loss Development



Year	Losses (Millions)
2004	2.500
2005	2.500

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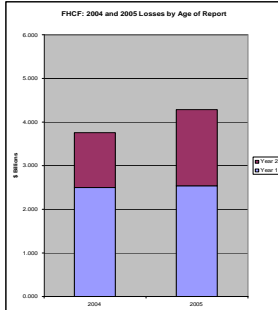
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## Contract Years Comparison: FHC Loss Development



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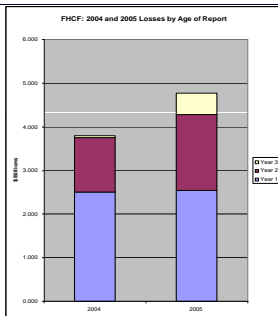
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## Contract Years Comparison: FHC Loss Development



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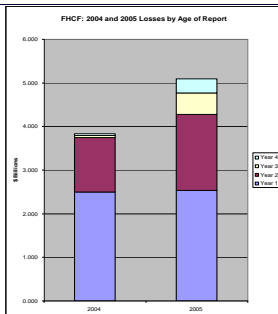
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## Contract Years Comparison: FHC Loss Development



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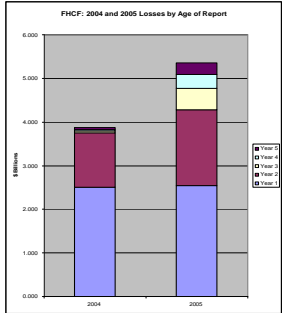
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## Contract Years Comparison: FHC Loss Development



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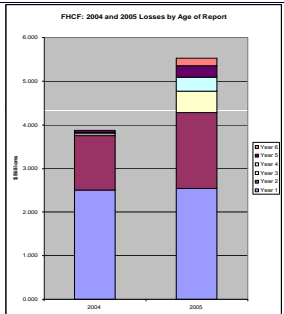
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## Contract Years Comparison: FHC Loss Development



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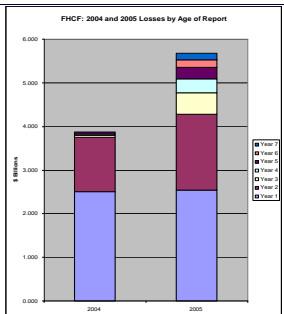
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## Contract Years Comparison: FHC Loss Development



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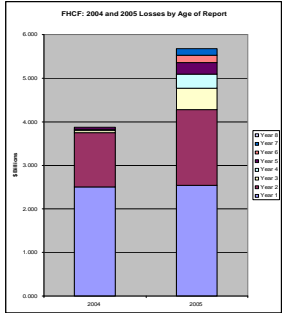
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## Contract Years Comparison: FHCF Loss Development



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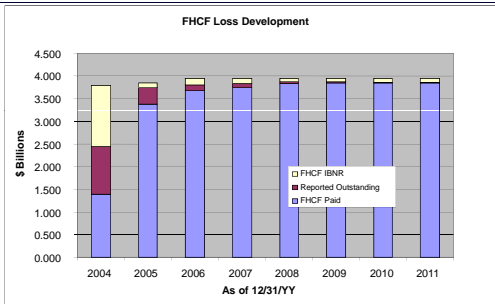
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## Contract Year 2004-2005: FHCF Loss Development



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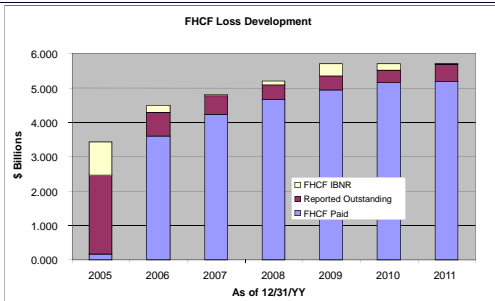
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## Contract Year 2005-2006: FHCF Loss Development



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# Questions?

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