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Massachusetts Property Insurance Underwriting Association 2013 Rate Filings
R2013-01

Decision and Order

I. Introduction and Procedural History

The Massachusetts Property Insurance Underwriting Association ("MPIUA" or the "FAIR Plan") submitted a rate filing on April 12, 2013 (the "Filing"), seeking overall statewide average rate increases for policies insuring homeowners and condominium owners and for policies providing dwelling fire and extended coverage.[1] It proposed an effective date of July 1, 2013 for the requested rates. Pursuant to Massachusetts General Laws Chapter ("Chapter") 175C, §5, the Commissioner of Insurance ("Commissioner") must approve the MPIUA's rates prior to their implementation.

A hearing notice, issued on May 3, 2013, scheduled public comment hearings on the Filing on May 29, 30 and 31, 2013 in, respectively, Barnstable (Hyannis), Boston and Springfield, Massachusetts, and a prehearing conference in Boston immediately after the public comment hearing. Two intervenors, the Massachusetts Attorney General ("AG"), as statutory intervener pursuant to Chapter 12, §11F, and the State Rating Bureau ("SRB") in the Division of Insurance ("Division"), opposed the proposed rates. Michael B. Meyer, Esq., Robert A.

[1] For all homeowner's forms, the MPIUA proposed a 6.8 percent statewide average increase. The proposed average differs depending on the type of insured property: for residential property owners, the proposed increase averages 7.0 percent and for condominium owners 6.1 percent. For tenants insurance the MPIUA recommends a 5.6 percent rate decrease. For dwelling fire and extended coverage policies the MPIUA is seeking a statewide average increase of 5.2 percent. The MPIUA sought no increase in the average rates for commercial property insurance.

Tommasino, Esq. and Michael W. Reilly, Esq. represented the MPIUA in this proceeding. Peter Leight, Esq. and Monica Brookman, Esq. appeared for the AG, and Thomas McCall, Esq. and Mary Lou Moran, Esq. represented the SRB.

The MPIUA included in its Filing pre-filed written testimony from seven witnesses, who were cross-examined on six hearing days in June, July and August 2013.[2] The AG and the SRB submitted advisory filings on September 4, 2013. Those witnesses were cross-examined on September 30 and October 9, 2013. A total of seventy documentary exhibits were proffered as evidence in the course of the hearing. On October 15, 2013, following a telephone conference, all of the exhibits were entered into evidence. The parties submitted their briefs on November 4, 2013.[3]

II. The Framework for Filing and Review of MPIUA Rates

The MPIUA, a joint underwriting association formed pursuant to Chapter 175C, operates the residual market for property insurance that provides coverage for Massachusetts consumers who are unable to obtain such insurance in the voluntary market. Chapter 175C, §5(b) authorizes the MPIUA to make rate filings in accordance with Chapters 174A and 175A, and provides further that its rates are subject to the Commissioner's prior approval after notice and hearing. Both Chapter 174A, the Fire, Marine and Inland Marine Rate Regulatory Law, and Chapter 175A, the Casualty and Surety Rate Regulatory Law, regulate insurance rates "to the end that they shall not be excessive, inadequate, or unfairly discriminatory." *See* Chapter 174A, §§2, 5(a)(2); and Chapter 175A, §§2, 5(a)(4).

Chapters 174A and 175A each identify specific factors that are to be considered in connection with homeowners' insurance filings, including catastrophe hazards and the cost of catastrophe reinsurance. *See* Chapter 174A, §5 and Chapter 175A, §5. Chapter 175C, §5 sets additional specific rules for MPIUA filings, including quantitative measures that may set limits on potential increases in both "large share" and "small share" territories. In reviewing an

[2] The seven witnesses for the MPIUA were: Paul Ericksen, FCAS, MAAA, a consulting actuary for the Insurance Services Office, who prepared the Filing; James Wackerman, a reinsurance broker with Guy Carpenter, who testified on reinsurance issues; Richard Derrig, Ph.D., who testified on the underwriting profits provision in the Filing; Conan M. Ward, a reinsurance consultant; David Lalonde, FCAS, an actuary for AIR Worldwide; Karen Clark, a consultant on hurricane modeling; and Eileen Burke, Audit and Budget Manager for the MPIUA.

[3] On November 14, 2013, the MPIUA moved to file a reply letter objecting to references in the AG's brief to the MPIUA's "last approved rates." Because the MPIUA's position on that reference was evident from statements made during cross-examination of its actuarial witness, we took no action on the letter. *See* Tr. Vol. IV, pp. 93-96, 125.

MPIUA filing, the Commissioner is to consider, "in addition to all other relevant factors," the loss experience of insurers in the voluntary market, as well as the MPIUA's experience, and the intent of Chapter 175C to make basic property insurance available at reasonable cost to eligible applicants in large share territories. The Commissioner is also required, in approving rates for homeowners insurance in all territories, to consider the effects of "predicted hurricane losses and the cost of catastrophe reinsurance on the rates charged by voluntary market insurers and the cost of catastrophe reinsurance and the predicted hurricane losses" on the MPIUA.[4]

In addition to these statutes, the Division's regulation 211 CMR 101.00, *et seq*., promulgated pursuant to Chapters 174A, 175A and 175C, governs the form and content of MPIUA rate filings and the proceedings, including hearings, relating to the review of its filings. 211 CMR 101.04 (1) declares that the purpose of the Filing is to "furnish sufficient evidence to enable the Commissioner to establish that the rates requested comply with the statutory requirements and fall within a range of reasonableness." It further states that the Filing constitutes the MPIUA's direct case in support of its requested rates.

211 CMR 101.04(b) also specifies that the Filing must contain "*all material*, including *all data, statistics, schedules and exhibits*, which the Filing Party *wishes to be considered* in the Proceeding and all information upon which it bases its recommendations;" "narrative statements *including all information and commentary necessary to substantiate* and explain *the Filing Party's recommendations;*" and "the *direct sworn written testimony of all witnesses for the Filing Party*," further requiring, in pertinent part, that the *direct sworn written testimony shall support every element of the Rate Filing…."* *See* 211 CMR 101.04(2)(b)(iv); 211 CMR 101.04(2)(b)(v); and 211 CMR 101.04(2)(b)(vi) (emphases added) The significance of sworn written testimony, and the cross-examination of those witnesses, is evident from 211 CMR 101.09(7), which permits the Presiding Officer to strike from the record testimony of a witness who is not available for cross-examination.

The Commissioner has the power to disapprove rates if an insurer does not provide supporting information which is "reasonably adequate" to enable him to determine whether proposed rates are "excessive, inadequate or unfairly discriminatory." *See Travelers Indemnity Co. v. Commissioner of Insurance*, 362 Mass. 301, 304 (1972). The *Travelers* Court noted that

[4] Chapter 436, §3 of the Acts and Resolves of 2004 rewrote Chapter 175C, §5, adding the specific requirement to consider these issues. It became effective October 1, 2005.

the provision of adequate evidence is a fundamental requirement that is implicit in the statutory requirement that rates conform to statutory standards. *See id.* at 305. The Commissioner may refuse to approve rates if the filer fails to provide information that is deemed necessary to "afford an adequate basis for his approval and to enable him to pass upon the dependability….of the conclusions." *Massachusetts Medical Service v. Commissioner of Insurance*, 346 Mass. 346, 348 (1963).

The MPIUA bears the burden to furnish evidence that will enable the Commissioner to find that its rates satisfy statutory requirements. *See, e.g., Massachusetts Association of Older Americans, Inc. v. Commissioner of Insurance*, 393 Mass. 404; 407, n. 6 (1984); *Workers' Compensation Rating & Inspection Bureau* v. *Commissioner of Ins.*, 391 Mass. 238, 245 (1984) (burden of proof on insurers to show that workers' compensation rates fall within range of reasonableness); and *Liberty Mutual Insurance Co. v. Commissioner of Insurance*, 366 Mass. 35, 42 (1974) (burden of proof on insurers to show that workers' compensation rates fell within range of reasonableness.) The application of that standard to the MPIUA was explicitly stated in the *Decision and Order on the 2007 Massachusetts Property Insurance Underwriting Association Rate Filing*, Docket No. R2007-02 ("*Decision on 2007 Rates*").[5] Failure to satisfy the burden of proof is grounds for disapproving a filing; the Commissioner has twice disapproved MPIUA filings for that reason.

III. The 2013 Filing

The MPIUA contends that its Filing addresses the concerns expressed in the Commissioner's decisions on its past filings, and that this year it has presented a "superbly documented Filing" that satisfies its burden of proof. Nevertheless, as the Commissioner stated in his *Order on Motion to Reject or Dismiss the MPIUA Filing*, Docket No. R2011-02, ("*Order on the 2011 Filing")*, addressing specific statutory or regulatory factors is not equivalent to complying with them; the MPIUA's burden is to present a direct case that proves, by a preponderance of the evidence, that its proposed rates are not excessive, inadequate or unfairly discriminatory and fall within a range of reasonableness.

This year, the MPIUA argues that the Commissioner should approve its Filing because the AG has not offered any concrete proposal for a different reinsurance rate provision or

[5] In that decision, the Commissioner wrote that "[t]he MPIUA bears the burden of supporting in its filings each aspect of its rate requests and proving, by a preponderance of the evidence that its rates satisfy the statutory requirements." *Decision on 2007 Rates*, p. 3.

competing values for the MPIUA's estimates of its average annual losses ("AAL"). The MPIUA asserts that the AG's witness, Allen Schwartz, has no expertise in reinsurance pricing and is not an expert on hurricane modeling.[6] It contends as well that the SRB found that the price of the MPIUA's reinsurance was reasonable for ratemaking and that its chosen AAL were reasonable for use in calculating the MPIUA's rates.[7] The MPIUA's reliance, as support for its Filing, on the lack of alternative quantitative proposals from the AG and the SRB for the cost of reinsurance or AAL fails to acknowledge that the MPIUA, not the AG or the SRB, bears the burden to demonstrate that its approaches to estimating reinsurance costs and hurricane losses comply with the standards and guidelines expressed in past rate decisions and result in proposed rates that satisfy the statutory requirements.

The SRB and the AG disagree with the MPIUA's assessment of the merits of its 2013 Filing. The SRB contends that the evidence submitted by the MPIUA is insufficient to allow a conclusion that the MPIUA's proposed rates fall within a range of reasonableness. It raises three specific problems with the Filing: 1) the inclusion in the rates of potential hurricane losses exceeding $1.2 Billion, suggesting that losses for such remote events should instead be considered an industry risk to be spread among the MPIUA's member companies; 2) application of a profit or risk load to the MPIUA's cost of reinsurance; and 3) the capping methodology that the MPIUA used on its tenant and condominium policies.

The AG also argues that the MPIUA has not met its burden of showing that the filed rates are reasonable and not excessive. She specifically objects to four aspects of the Filing: 1) the underwriting profit provision; 2) the use of a hurricane model that, according to the AG, is not appropriate for determining the hurricane loss provision in the Filing; 3) the reinsurance costs that, the AG argues, are not reasonable; and 4) the methodology that the MPIUA uses to develop its loss trends.[8]

The MPIUA has made five rate filings since October 1, 2005, the effective date of the revised Chapter 175C, §5(c). The Commissioner issued decisions or orders in the proceedings on the 2005, 2007 and 2011 filings; in 2009 the parties to the proceeding submitted a stipulation

[6] The MPIUA argues that the documents Mr. Schwartz relied on in calculating "alternate reinsurance rates" are derived from sources that do not provide reliable estimates of the cost of catastrophe reinsurance. Because Mr. Schwartz is not an expert on hurricane modeling, the MPIUA argues that his testimony is not a proper basis for making decisions on AAL.

[7] Ms. Blank testified that her analysis of the MPIUA's rate need reflected the cost of reinsurance in its Filing, but that she had no opinion on whether it was "a great price or a terrible price." Tr. Vol. VII, p. 9.

[8] The AG also argues that the MPIUA's record of profitability since 2006 makes a rate increase unnecessary.

that the Commissioner approved. The 2005, 2007 and 2011 decisions and orders, therefore, constitute precedent for the analysis and review of the current filing.[9] Those decisions focus, in large measure, on the MPIUA's estimated losses from hurricane events and its reinsurance costs. For each of the reasons expressed below, we conclude that with respect to those issues, the MPIUA, in its 2013 Filing, has not met its burden of proof to demonstrate that its proposed rates would not be excessive or unfairly discriminatory. We do not address issues relating to other aspects of the filing, and express no opinion on the adequacy of the evidence offered by the MPIUA in support of those other sections of the Filing.

A. Hurricane Loss Provisions

The MPIUA argues that its filing on expected hurricane "costs" complies with traditional actuarial principles and standards and is "eminently reasonable." It points out that it includes in the rates hurricane related costs net of expected insurance recoverable, *i.e.*, losses that its reinsurers would cover, and that it used the lowest of five estimates of AAL from hurricanes that were available to it.[10] The MPIUA further asserts that it has fully responded to comments in past decisions and orders on MPIUA filings.

In the *Decision and Order on the Massachusetts Property Insurance Underwriting Association Rate Filings,* Docket No. R2005-14 ("*Decision on 2005 Rates")*, the Commissioner approved the use of mathematical models to estimate the MPIUA's potential losses from hurricanes, but observed that there is no single preferred approach to using such models.[11] The hurricane loss models that the MPIUA relies on in all its rate filings since 2005 are commercial products offered by organizations that create catastrophe risk models for the insurance industry.[12] The three principal building blocks for catastrophe models focused on hurricanes are modules estimating storm frequency in a particular geographic area, the intensity of those

[9] 211 CMR 101.00, the procedural regulation applicable to MPIUA rate filings, specifically provides that previous decisions on MPIUA filings may be relied on as precedent, and permits the Presiding Officers, in the absence of significant new evidence or other good cause, to preclude the Parties from relitigating facts or issues, including methodological issues, decided in previous decisions.

[10] The MPIUA points out in its brief that its reinsurance broker, Guy Carpenter, showed it a series of estimated values for hurricane losses modeled both by AIR Worldwide ("AIR") and by Risk Management Solutions ("RMS"), and that the MPIUA chose the lowest of those values for use in Mr. Ericksen's actuarial calculations. Selection on that basis does not relieve the MPIUA from its obligation to provide evidence that its chosen model satisfies the Commissioner's enunciated standards and will produce rates that satisfy the statutory standards.

[11] Insurers in large measure rely on mathematical models to estimate catastrophe losses because the relative rarity of such events means that relevant historical data are scarce. The models therefore extrapolate the frequency and intensity of potential events, and their damage effect on insured property, from a limited number of data points.

[12] RMS, AIR and EQECAT are three modelers that the MPIUA has engaged at various times.

storms, and the vulnerability of structures in the relevant area; the output from those blocks is then applied to a particular insurer's book of business to estimate the economic losses it might incur as the result of a hurricane. The Commissioner reviews the MPIUA's cost of hurricane reinsurance under the standards applicable to other expenses, whether it falls within a range of reasonableness and will result in rates that satisfy the statutory standards. Furthermore, Chapter 175, §5(c) specifically identifies the MPIUA's "predicted hurricane losses" as an element to be considered in determining whether its proposed rate increases for large share territories exceed the statutory cap.[13] It is essential, therefore, that the MPIUA demonstrate that the factor for hurricane losses added to its rate request reflects only losses from events that qualify as "hurricanes" when they damage the property of MPIUA policyholders.[14]

In the *Appendix to the Decision and Order on Massachusetts Property Insurance Underwriting Association Rates,* Docket No. R2007-02 ("*Appendix to the Decision on 2007 Rates*"), the Commissioner addressed the standards for evaluating simulation models relied on by the MPIUA to estimate hurricane losses. A model must be "appropriately calibrated to Massachusetts conditions and consistent with the record of storms that have affected Massachusetts."[15] The MPIUA must show that the model outputs reflect only hurricanes that make landfall in Massachusetts or pass by so closely that hurricane winds damage insured property in Massachusetts. The MPIUA's burden, therefore, is to ensure that the model which it uses as a basis for its proposed rates estimates wind damage *caused by hurricane-force winds in Massachusetts* to property in Massachusetts rather than wind damage from storms that formerly produced hurricane winds elsewhere.

The MPIUA must also demonstrate that the model outputs consider the vulnerability to wind damage of insured structures in Massachusetts and develop reasonable estimates of the losses that a hurricane would cause to the MPIUA's book of business. The MPIUA's Filing must not simply adopt the model outputs, but must evaluate those outputs "to determine that they are appropriate for ratemaking and produce rates that fall within a range of reasonableness."[16] To that end, the model output must be shown to be consistent with the historical record in Massachusetts.

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[13] See *Decision on 2005 Rates*, pp. 17-18.
[14] Although the statute refers to "predicted" hurricane losses, the models represent "expected" hurricane losses. They do not include a predictive factor for weather patterns or conditions.
[15] *Appendix to the Decision on 2007 Rates*, pp. 5-6.
[16] *Id*., pp. 7-8.

In past filings, the MPIUA has engaged the services of two modelers, AIR Worldwide Corporation ("AIR") and Risk Management Solutions ("RMS") to estimate potential hurricane losses to its book of business. This year, however, it relies solely on outputs from an AIR model to support its $41 million estimate of expected gross hurricane losses, including loss adjustment expenses ("LAE").[17] Our analysis of the Filing raises a number of issues, including but not limited to compliance with the factors previously identified by the Commissioner as relevant to determining whether the MPIUA has satisfied its burden of proof.

At the outset, we observe that the Filing inconsistently identifies the AIR model that was used to estimate hurricane losses, and does not explain the reasons for its decision to utilize a version that differs from AIR's "standard" simulation model. The MPIUA filing includes an AIR Brochure titled "AIR Hurricane Model for the United States" (the "AIR Brochure") and a second AIR document titled "Catastrophe Loss Analysis Service" ("Catastrophe Loss Analysis") that was specifically prepared for the MPIUA.[18] The AIR Brochure refers to its subject as "Model Version 14.0", while the Catastrophe Loss Analysis states that it is based on AIR's "Atlantic Tropical Cyclone Model Version 14.0.4." Mr. Lalonde's written testimony refers to the model used to estimate the MPIUA's hurricane losses as the "Atlantic Tropical Cyclone model, Version 14.0."[19] He thereafter described the AIR Brochure as a more technical description of the "AIR Hurricane Model for the United States."[20]

The MPIUA offers no explanation of the reasons for the different titles or the differences, if any, between versions 14.0 and 14.0.4 that could have affected the model output. Further, the AIR Brochure describes the model as incorporating a "standard" 10,000 year catalogue of simulated hurricanes with wind speeds of at least 74 mph.[21] A footnote to that statement notes that stochastic catalogues are also available for 50,000 and 100,000 years. In estimating MPIUA

[17] The gross value, according to Mr. Erickson, reflected $37 Million in AAL modeled by AIR and LAE calculated as 10 percent of those losses. Tr. Vol. IV, pp. 82-83. The MPIUA also offered Karen Clark, founder of AIR and now president of Karen Clark and Company, as a witness on hurricane losses. Ms. Clark testified that the MPIUA engaged her company to conduct an analysis of the MPIUA's hurricane loss potential. Tr. Vol. V, p. 9. Mr. Ericksen testified that he did not rely on the output from her analysis in preparing the Filing, but considered it in terms of assessing the reasonability of the AIR results. Tr. Vol. IV, p.17. Ms. Clark bases her analysis on RiskInsight which, she testified, is not a simulation model but a "tool" for assessing hurricane risk. Tr. Vol. V, pp. 9, 26.

[18] Hearing Exhibit 3, pp. 61-209, 210-254.

[19] *Id.*, p. 5.

[20] *Id.*, p. 11.

[21] *Id.*, p. 71

property losses, AIR utilized the 100,000 year catalogue. The MPIUA offers no explanation for its choice and no information on the effect of that choice on its loss estimates.

The AIR model underlying the 2013 Filing produces higher values for hurricane frequency and MPIUA losses than past versions of AIR's model. The MPIUA's witness, David Lalonde, a senior vice-president of AIR, testified that in recent years AIR has updated its model annually to reflect changes to the North Atlantic Hurricane Database ("HURDAT") resulting from an ongoing project to reanalyze the HURDAT content, and that every two or three years AIR re-estimates the model's probability distributions to include additional years of hurricane experience.[22] With respect to changes to the model used to develop Massachusetts loss costs, he testified that AIR had updated its historical storm catalogue to incorporate HURDAT information as of June 2009, changed its practice of arbitrarily limiting a hurricane's existence to a time period of 24 hours after landfall, and incorporated new data on ground cover.[23]

Mr. Lalonde further testified that the AIR model increased the total United States frequency estimate by about 5.6 percent between the model that the MPIUA used to develop its 2009 rates and the model it used in 2011.[24] The MPIUA argues that this result is reasonable because it is closer to the output produced by an RMS model.[25] Its argument is not persuasive. The MPIUA's burden is to provide evidence that the model satisfies the Commissioner's standards and that the estimated values incorporated into its Filing are within a range of reasonableness and will produce rates that are not excessive and fall within a range of reasonableness.

1. Frequency and Severity

In the *Appendix to the Decision on 2007 Rates*, the Commissioner identified validation of a model's accuracy at estimating the frequency of hurricanes that cause wind damage to properties in Massachusetts as a significant question for Massachusetts ratemaking. She pointed

[22] HURDAT is maintained by the Hurricane Research Division of the National Oceanic and Atmospheric Administration ("NOAA"). See *Appendix to the Decision on 2007 Rates*, p.8, fn.19.

[23] In his written testimony, Mr. Lalonde stated that the HURDAT Tropical Cyclone Data Tape for the North Atlantic Basis, 1900-2008 is a key data source underlying the AIR model. It is uncertain to what extent the 2009 (or later) information from HURDAT affected that key source. Mr. Lalonde commented that the model would not have taken into account the apparent reassignment, as a result of the HURDAT reanalysis, of the 1938 Hurricane to a Category 2 rather than a Category 3 storm and a 1944 storm to Category 1 rather than Category 2 in Massachusetts. Hearing Exhibit 54, p. 9. (No date of publication is shown; the authors cite to articles published in 2006.)

[24] Hearing Exhibit 3, p. 56.

[25] Mr. Lalonde, in his written testimony, stated that differences in loss estimates produced by different hurricane models have no bearing on the reliability of modeling. Hearing Exhibit 3, p. 39.

out that differences in quantifying the number of storms in the record significantly affect the calculation of hurricane losses, and that it therefore is important to analyze the methodology and rationale underlying the model and to reject parameters that may either artificially inflate or underestimate hurricane frequency. She stated that "[a] ratefiler should ensure that, for purposes of estimating hurricane losses in Massachusetts, frequency is validated by demonstrating that it correctly matches the record of storms that caused wind damage in Massachusetts at a time when they are correctly classified as hurricanes." [26]

A hurricane, according to Mr. Lalonde, is defined by a sustained wind speed of at least 74 mph.[27] A storm that does not make landfall in a region but comes close enough so that there are hurricane force winds on shore is known as a bypassing hurricane.[28] For purposes of estimating frequency and, ultimately, hurricane losses, the model should be calibrated to distinguish events that are properly classified as hurricanes from less intense wind storms that may damage property insured by the MPIUA.

The AIR Brochure states that, since 1900, 11 hurricanes have made a direct hit in the northeastern United States, defined as New Jersey and coastal states further north.[29] According to an AIR response to a discovery request, only one of those 11, Edna, made landfall in Massachusetts.[30] Mr. Lalonde testified that, measured by landfall, the historical frequency of a hurricane in Massachusetts is 0.9 percent.[31] He was not certain whether the AIR model produces a numerical value for hurricanes that bypass Massachusetts, and did not know how many such storms had caused damage in Massachusetts since 1900.[32] The MPIUA did not present evidence sufficient to support a conclusion that the Northeast storms listed in Hearing Exhibit 26 that did not make landfall in Massachusetts should be classified as hurricanes within Massachusetts.

Mr. Lalonde testified that the AIR Model no longer assumes that a hurricane will dissipate within 24 hours.[33] He described that change as an improvement to the model that, with

[26] *Appendix to the Decision on 2007 Rates*, p. 8.
[27] Tr. Vol. VI, pp. 108, 112. Mr. Lalonde had earlier testified that a tropical storm became classified as a hurricane starting at around 70 or 73 miles per hour. Tr. Vol. VI, p. 22. His later testimony is consistent with the Saffir-Simpson Hurricane Wind Intensity Scale shown in Hearing Exhibit 3, p. 78.
[28] *Id.*, p. 23
[29] Hearing Exhibit 3, p. 80.
[30] Hearing Exhibit 26.
[31] Tr. Vol. VI, p. 64. Mr. Lalonde then testified that he was unaware that the AIR model estimated the frequency of hurricanes making landfall in Massachusetts at about 2 ½ percent.
[32] *Id.*, pp. 23-24.
[33] Tr. Vol. VI, pp. 108, 111.

respect to Massachusetts, means that time periods for storms that made landfall further south, such as the Gulf of Mexico or the Mid Atlantic, were extended to reflect that fact that they may affect Massachusetts more than 24 hours after landfall.[34] However, to be classified as a hurricane in Massachusetts, the recorded wind speeds should be at least 74 mph in Massachusetts.[35]

AIR's stochastic model generates windfields that incorporate the changing characteristics of simulated storms from landfall to dissipation.[36] However, under the revised model, AIR continues to track modeled events after the sustained wind speeds diminish to less than 74 mph, measuring dissipation of the event at the point where its wind speeds are below 40 mph.[37] Classifying as "hurricanes" wind storms that do not generate winds of hurricane force in Massachusetts inevitably will increase frequency estimates. Enlarging the modeled geography of a "hurricane" to include periods in which wind speeds are between 40 and 74 mph in Massachusetts will also expand modeled estimates of the MPIUA's damages to include losses caused by winds of less than hurricane force. Consequently, rates developed from estimates of "hurricane losses" that incorporate damage from modeled storms that are not hurricanes in Massachusetts will be excessive.[38] The MPIUA's burden is to demonstrate that the modeled hurricane frequency and damage estimates reflect the historical record and model only storms making landfall in or bypassing Massachusetts that generate hurricane force winds in Massachusetts.

According to Mr. Lalonde's testimony, the AIR Model estimated the frequency of storms that would cause wind damage in Massachusetts at 0.165.[39] That value, however, includes so-called Category 0 storms.[40] In estimating hurricane frequency or hurricane losses in Massachusetts, it is unreasonable to include events unless they are demonstrated to produce

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[34] Hearing Exhibit 3, p. 36.
[35] Any damage estimates should also reflect only damage caused by winds of at least that velocity.
[36] Hearing Exhibit 3, pp. 30, *et seq*.
[37] Tr. Vol. VI, pp. 108, 112.
[38] Mr. Lalonde offered, as a rationale for this adjustment to the model, that insurers pay claims for wind damage that they "know" were caused by a hurricane, regardless of the wind speed at the location of the loss. Tr. Vol. VI, p. 112.
[39] Hearing Exhibit 3, p. 45. His estimate is considerably higher than Ms. Clark's frequency estimate, 0.065. Tr. Vol. V, pp. 17, 35.
[40] The definition of a Category 0 storm is not entirely clear. Mr. Lalonde first described such storms as tropical cyclones (Tr. Vol. VI, p. 25) and later as storms that bypass the United States coastline and do not make landfall anywhere in the United States. He stated that such bypassing events could be classified in any Saffir-Simpson category. Tr. Vol. VI, p. 55.

winds of hurricane strength in Massachusetts.[41] Mr. Lalonde did not know whether the AIR model produces bypassing hurricanes that cause damage to MPIUA exposures nor did he know how many bypassing storms caused damage in Massachusetts since 1900.[42] The AIR model nevertheless includes an estimate of MPIUA losses from storms that are not classified as hurricanes and have not been shown to produce hurricane force winds in Massachusetts. The AIR model, Mr. Lalonde testified, did not alter its synthetic catalogue of potential hurricanes that may occur in a year to include only storms that have hurricane force winds once they cross the state line of Massachusetts.[43] Its failure to do so affects estimates of frequency of storms that might cause damage to MPIUA exposures.

A second reason that the MPIUA gives for the increased loss estimates produced by the AIR model in the 2013 Filing is changes resulting from reanalysis of the HURDAT database. Because that database includes information for the entire United States, without more specific evidence of the effect of those changes on Massachusetts we cannot determine whether the model outputs are reasonable for Massachusetts ratemaking. Mr. Lalonde testified that AIR's estimate of a 5.6 percent increase in hurricane frequency was an overall value for the United States, and did not apply equally to all regions.[44] He stated that the model used in the Filing reflected that increased frequency, but did not explain what portion, if any, of that value AIR applied in the analysis of the MPIUA's losses.[45] Mr. Lalonde agreed that no hurricane occurred in New England between 2009 and 2011 that would provide additional data on the MPIUA's expected hurricane loss.[46]

AIR's Catastrophe Loss Analysis for the MPIUA states that the most important influence on hurricane losses is intensity, or severity, as measured by wind speed.[47] AIR assigns a hurricane to a category on the Saffir-Simpson scale according to its wind speed at the last

[41] The AIR model defines as a bypassing hurricane a storm that passes close enough to land to cause damaging winds of 40 mph or higher onshore, although the eye of the storm does not cross the coastline. Hearing Exhibit 3, p. 98.
[42] Tr. Vol. VI, pp. 23-24.
[43] Hearing Exhibit 3, p. 55.
[44] Tr. Vol. VI, pp. 71-72.
[45] Tr. Vol. VI, p. 70.
[46] Tr. Vol. VI, p. 78. Mr. Lalonde further agreed that the historical frequency of hurricanes changes with the number of years in the historical period. As the historical period lengthens, absent any additional events, frequency would go down. Tr. Vol. VI, p. 102.
[47] Hearing Exhibit 3, p. 215.

landfall closest to Massachusetts.[48] Mr. Ericksen adopted that estimate of severity for purposes of developing the MPIUA's estimated hurricane losses.[49] Mr. Lalonde testified that the model was not intended to be used to catalogue only storms that generate hurricane force winds in Massachusetts and asserted that "it is not possible or feasible to modify the model in this way without compromising its integrity."[50]

Estimating MPIUA losses from storms that are assigned to a Saffir-Simpson category based on wind speeds measured at a landfall location outside of Massachusetts does not constitute evidence that modeled wind speeds in Massachusetts will be either within the range of the initial classification or even fall within any Saffir-Simpson hurricane category at the time they affect Massachusetts property.[51] The failure to reclassify a storm initially assigned to a Saffir-Simpson category to reflect correctly its status as a hurricane in Massachusetts may bias estimates of the magnitude and severity of storms that cause damage property in Massachusetts and therefore overestimate the MPIUA's modeled hurricane losses.

AIR's approach to estimating severity is problematic for two reasons. First, it is not developed from data that specifically measured wind speeds in Massachusetts, and second, it monitors wind speeds until they fall below 40 mph, thus including in estimated "hurricane" losses damage from winds that are much lower than hurricane speeds. Mr. Lalonde testified that "the AIR hurricane model generates the complete time profile of winds at any given location."[52] That model, however, according to Mr. Lalonde, is not based on any actual data about wind

[48] Tr. Vol. VI, p. 68. Hearing Exhibit 3, p. 78 includes a table of the Saffir-Simpson wind intensity scale. A Category 1 Hurricane is characterized by maximum sustained wind speeds between 74 and 95 mph; Category 2, 96-110 mph; Category 3, 111-130 mph; Category 4, 131-155 mph; Category 5, over 155 mph. Storms may also be classified according to central pressure.

[49] Mr. Erickson testified that his definition of a hurricane, as used to determine the MPIUA's modeled hurricane losses included in the rate analysis, was a "hurricane event that would have been at hurricane strength when it made landfall in the United States." Tr. Vol. IV, p. 13. He believed that it might also include storms that did not make landfall but caused some peripheral damage (*i.e.*, bypassing storms.) Mr. Ericksen also stated his understanding that the hurricane events used in his rate calculation include storms that were classified as hurricanes when they made landfall at a location outside Massachusetts, even though they had weakened to a tropical storm by the time they damaged property in Massachusetts. Tr. Vol. IV, p. 14.

[50] Hearing Exhibit 3, p. 55.

[51] Mr. Lalonde's testimony indicates that AIR internally models local wind speeds that are used to calculate damages and that a storm in any given Saffir-Simpson category will produce a windfield that includes a variety of wind speeds. He stated that the wind speeds were not part of the model output. The starting point for the model is the wind speed at the last landfall closest to Massachusetts, because that is the way the model is designed. Hearing Exhibit 3, pp. 45-46.

[52] Hearing Exhibit 3, p. 41. Mr. Lalonde explained that the exposures in an insurer's book of business are geo-coded by latitude and longitude, a procedure that enables a merger of the wind speed for a given location with exposure data at that location.

speeds in Massachusetts or any comparison of wind fields in Massachusetts against historical data.[53] AIR validates the model by comparing wind fields that it produces against historical losses in other regions; Mr. Lalonde characterized it as validated from a "scientific perspective, not from having actual data in Massachusetts."[54] Although the model, as applied in the Filing, does not reflect wind speeds in Massachusetts, it is not impossible to acquire that data. Mr. Lalonde testified that, without using customized software coding, there is no practical way to measure wind speed along the borders of Massachusetts. [55] It appears, on this record, that the MPIUA did not elect to explore that option.

On the second issue, as noted above, the AIR model tracks wind speeds associated with a modeled hurricane until they fall below 40 mph. Mr. Lalonde testified "with certainty" that any loss producing event in MA had wind speeds greater than 40 mph.[56] He stated that AIR developed that cutoff point because, although it could continue running the model at hourly intervals as long as the storm produced winds, it concluded that, once the winds dropped to below 40 mph, any losses would be smaller and insignificant. He described the choice of cutoff as a balance between efficiency and material damage.[57] Mr. Lalonde further testified that the model does not separate damages that might occur from winds at less than hurricane strength, stating that insurers, "knowing" that the damage was caused by this hurricane, pay losses from wind damage claims as hurricane losses regardless of wind speed at the site of the damage.[58] AIR's approach, in effect, includes as "hurricane losses" damages from winds that are as much as 34 mph below the parameters for defining a hurricane, and from storms that may never have reached hurricane force in Massachusetts.[59] Its decision to model losses that are not caused by

[53] Tr. Vol. VI, pp. 60-61. Ms. Clark testified, however, that the National Hurricane Center has Massachusetts wind speed data for Hurricane Bob and that there might be for Edna. Tr. Vol. V, p. 97.
[54] *Id*.
[55] Hearing Exhibit 3, p. 46.
[56] Tr. Vol. VI, p. 59.
[57] *Id.*, pp. 59-60.
[58] Tr. Vol. VI, p. 112. Classifying wind damage claims as "hurricane losses" when they are caused by winds that are below hurricane force creates an inaccurate report of the number of claims that result from hurricane force winds, and an inaccurate estimate of the losses associated with hurricanes. Overestimates of hurricane losses will affect the analysis of the need for reinsurance to cover hurricane losses and the cost of reinsurance. According to Ms. Burke, the MPIUA relies on an external source, identified only as an industry association, to determine whether claims should be classified as catastrophe claims and, within that grouping, as hurricane or non-hurricane catastrophe claims. Nothing in the record indicates that the industry association, in making that determination, considers wind speed at the location of the damaged property.
[59] Mr. Lalonde testified that AIR, in creating its model, looks at landfall statistics and then models the hurricane's windfield and wind speed for every hour. If the model shows wind speeds in Massachusetts that are over 40 mph, the model calculates damages. Tr. Vol. VI, p. 30.

hurricane force winds inevitably increases its overall estimate of "hurricane" damages to the MPIUA book of business.[60]

In addition to affecting frequency estimates, the additional analysis of the HURDAT database revised estimated wind speeds for historical hurricanes, increasing some and decreasing others. Mr. Lalonde testified that these revisions would affect the landfall parameters in the model, the starting point for analyzing how wind speed changes as it moves over land surfaces; AIR also uses a wind field formula to calculate such changes.[61] AIR's model, however, is not affected by changes to the actual observed wind speeds over land.[62] AIR's methodology, regardless of changes to the HURDAT database, continues to focus on landfall data as the basis for modeling the lifecycle of a hurricane, without integrating observations or historical data that are specific to Massachusetts.[63]

Ultimately, the MPIUA must demonstrate that the AIR model it uses to estimate losses from hurricanes in Massachusetts is consistent with the historical record in Massachusetts. Frequency therefore should be measured by storms that are properly classified as hurricanes when they either make landfall in Massachusetts or pass by so closely that hurricane force winds damage insured property in Massachusetts. Severity should be measured by wind speeds that can be reasonably shown to occur in Massachusetts.

A model that is used to estimate hurricane losses should produce a stochastic catalogue that is consistent with the historical record and reflects events that have some reasonable likelihood of occurrence.[64] The AIR model, as applied to the MPIUA book of business,

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[60] It further affects the analysis of the application of the capping mechanism for large share territories prescribed by Chapter 175C, §5(c).

[61] Tr. Vol. VI, p. 75.

[62] *Id*.

[63] For example, Mr. Lalonde testified that the AIR model would not take into account the reclassification in the HURDAT data base of the 1938 New England Hurricane from a Category 3 to a Category 2 hurricane, or of reclassification of the 1944 hurricane.

[64] The AIR stochastic model generates a wide range of possible events that do not necessarily match the somewhat limited historical records. For example, the AIR Brochure includes a comparison of Historical v. Simulated tropical cyclone landfalls by 100 mile nautical coastal segment. Hearing Exhibit 3, p. 107, Figure 32. The coastal segments, mapped in Figure 31, Hearing Exhibit 3, p. 106, identify two coastal segments for Massachusetts, 28 and 29. For segment 28, the simulation, according to Figure 32, exceeds the historical record. Neither the simulation nor the historical record reports any landfalls in segment 29. Mr. Lalonde testified that the model includes 45 percent more simulated landfalling hurricanes than the historical record. Tr. Vol. VI, pp. 27-28. Figure 32 suggests that hurricane force winds in Massachusetts are principally the result of bypassing storms or the residuals of storms making landfall elsewhere. It is essential, for developing reasonable estimates of the MPIUA's potential hurricane losses for ratemaking purposes, that a model reflect the wind speeds that are expected to occur in Massachusetts and validate those results by comparing them to historical data.

produces a value for modeled losses from a Category 5 hurricane of over $13 billion. Mr. Lalonde testified that the model is consistent with the historical record and that the inclusion of one Category 5 hurricane in the current AIR stochastic catalog is supported by research, although the probability of one occurring is "considered very remote."[65] Mr. Lalonde testified that this result does not mean that the modeled damages reflect wind speeds in Massachusetts consonant with a Category 5 hurricane.[66] Nevertheless, he found it appropriate for the AIR model to include such an event in the stochastic storm set for the Northeast that is applied to the MPIUA's exposures in Massachusetts, because a storm of that magnitude that made landfall in the south could reach Massachusetts with hurricane or damaging winds.[67]

Mr. Lalonde's testimony is inconsistent with the statement in the AIR Brochure that it concluded, after exploring several scenarios, that its simulation model showed that that "the probability of a Category 5 hurricane [in the Northeast] was sufficiently close to zero to warrant their exclusion from the catalogue for this region."[68] Similarly, according to Mr. Lalonde, the historical record for the Northeast includes no Category 4 storms and no storms of that magnitude have resulted in losses to the MPIUA.[69] Nevertheless, the AIR model estimates that Category 4 and Category 5 storms could generate AAL of $9.26 million for the MPIUA.[70] The inclusion in potential hurricane losses of a value based on events that are generated by a model but are not supported in the historical record artificially inflates estimates of the MPIUA's AAL and will result in rates that are excessive.

2. Vulnerability

The model's vulnerability function estimates potential damage to the MPIUA's book of business. The Commissioner addressed the standard for evaluating the requirements for developing a vulnerability function in her *Decision on 2005 Rates*, concluding that the model should, among other things, consider specific provisions in the Massachusetts building code

[65] Hearing Exhibit 3, p. 43.
[66] Tr. Vol. VI, pp. 40-41.
[67] Tr. Vol. VI, p. 28. Mr. Lalonde also testified that "it would be hard to imagine a storm making landfall [along the Gulf of Mexico or the South Atlantic seaboard] still having tropical force when it reached Massachusetts."
[68] Hearing Ex. 3, p. 110.
[69] Tr. Vol. VI, pp. 103, 106. Hearing Exhibit 3, p. 50R. AIR has a historical catalogue of storms that it runs against portfolios of business to determine whether those storms produced losses for that portfolio. The historical Category 4 storms in the catalogue that was run against the MPIUA's book of business made landfall elsewhere in the United States.
[70] *Id*., p. 51

relating to wind loading and building practices.[71] The Commissioner, in 2007, determined that vulnerability functions in a model should reflect Massachusetts construction characteristics and should not incorporate estimated losses from events that have virtually no likelihood of occurrence in Massachusetts.[72] The AIR Brochure generally describes the hurricane model's methodology as a procedure superimposing the modeled intensities of a simulated event onto a database of exposed properties; the model defines hazard in terms of wind speed or water depth. The modeled damage functions look at the response of a particular type of structure to a hazard, but also such factors as claims adjustment practices, building codes and code enforcement, and the preparedness and response of individuals and communities to hurricane risk.[73]

Mr. Lalonde's prefiled testimony reiterates AIR's approach to determining damageability of property.[74] He stated that damage functions are based on wind engineering research, engineering analysis, damage survey observations, actual insurer claims data and "considers the evolution of building codes and enforcement in Massachusetts."[75] Mr. Lalonde testified, however, that AIR had no documents that were specific to Massachusetts and did not perform site inspections post events to determine vulnerability. It developed its vulnerability function by looking at structural tests on buildings in "certain" regions, and inferring how that construction correlates with building stock in Massachusetts.[76]

According to Mr. Lalonde, AIR recently updated its wind damage functions based on analyzing detailed claims data from recent hurricane seasons, and updated information on the year of construction to capture the evolution of factors affecting building vulnerability, including "the evolution and enforcement building codes across all states including Massachusetts" and changes to construction practices, building code enforcement, and "other factors" affecting vulnerability over time.[77] However, in response to a question seeking a description of specific changes to the Massachusetts building code in coastal communities, Mr. Lalonde could provide no information on, nor could he estimate, the manner in which any such changes would affect the

[71] *Decision on 2005 Rates*, p. 22.
[72] *Appendix to the Decision on 2007 Rates*, pp. 12, 10.
[73] Hearing Exhibit 3, p. 125.
[74] Hearing Exhibit 3, pp. 22-24, 37-38, 46-47.
[75] Hearing Exhibit 3, p. 24; Tr. Vol. VI, p. 31.
[76] Tr. Vol. VI, pp. 61-62.
[77] Hearing Exhibit 3, p. 37.

damageability of an average home.[78] He speculated that, with respect to the enforcement of building codes in Massachusetts, AIR engineers had talked to local engineers and considered ISO documents, but could offer no specific information on AIR's methodology for obtaining information incorporated into the model on building code enforcement.[79]

The AIR model, Mr. Lalonde testified, was refined to include more year-built categories and factors that would look at the structure's actual age.[80] However, he stated, AIR looks only at the initial date of construction, and does not take any remodeling into account.[81] Neither does it appear to adjust the model to acknowledge building practices and standards applicable to the construction of older buildings that have withstood winds from events that might be categorized as hurricanes. Mr. Lalonde commented that it would be hard to make such a determination because AIR does not know the wind speeds to which the building was subjected.[82]

The MPIUA, as in past Filings, has not demonstrated that the vulnerability function in the AIR model is developed from information specific to Massachusetts and reflects the vulnerability of Massachusetts properties. For that reason, the Filing does not satisfy the Commissioner's standard for concluding that the vulnerability function produces a reasonable outcome.

3. Other factors

The estimate of the losses that the MPIUA might incur as a result of a hurricane is not limited to the modeled value of covered damage to insured property but also includes LAE and certain non-modeled losses, including demand surge. The MPIUA selected an LAE factor of 10 percent for hurricane claims, but calculated significantly higher ratios for the years ending on September 30, 2011 and September 30, 2012, based on loss values of $1,111,517 for 2011 and $4,811,428 for 2012 and LAE for those years, respectively, of $280,410 and $785,401.[83] Mr.

[78] Tr. Vol. VI, pp. 32-33. Mr. Lalonde commented that AIR could run the raw model and provide an estimate, but he had not done that.
[79] Tr. Vol. VI, p. 110.
[80] *Id.* The categories for Massachusetts are, according to the AIR Brochure, before 1994, 1995-2004, 2005-2008, and 2009 to date. Hearing Exhibit 3, p. 142.
[81] Mr. Lalonde indicated that an underwriter could change the construction data if he or she believed that a remodeled building reflects a newer building code. The AIR Brochure, however, describes building upgrades as a key element in its vulnerability module. Hearing Exhibit 3, p. 129. While it describes elements of construction that mitigate potential hurricane loss, the Filing does not indicate that the MPIUA provided AIR with any documentation of mitigation efforts at its exposures.
[82] Tr. Vol. VI, pp. 113-114.
[83] The MPIUA's exhibit on LAE ratios for hurricane claims shows no hurricane losses in the years ending on September 30, 2008 through September 30, 2010.

Ericksen testified that these losses represented damages caused by Hurricane Irene; subsequently he agreed that Irene was not actually a hurricane in Massachusetts.[84] Similarly, he testified that any losses incurred by the MPIUA as a result of Superstore Sandy in 2012 would be classified as hurricane losses.[85] Classifying as "hurricane losses" damage from tropical storms that did not make landfall in Massachusetts and have not been shown to be bypassing storms producing hurricane force winds in Massachusetts artificially inflates the historical record and is not an acceptable basis for calculating any aspect of the MPIUA's rates, including LAE ratios that may apply to claims for hurricane damage.[86]

a. Demand surge

"Demand surge" as defined by Mr. Lalonde, is "post-event inflation of loss caused by strain on resource and material supplies." [87] In the *Appendix to the Decision on 2007 Rates,* the Commissioner stated that the MPIUA's utilization of modeled damage estimates that include an unquantified demand surge factor raised a question of the reasonableness of its proposed rates. The *Decision on 2005 Rates* addressed the MPIUA's addition of a demand surge factor to its proposed modeled losses because the hurricane models that it used that year omitted such a factor. The Commissioner, after comparing a modeled demand surge factor to that proposed by the MPIUA, concluded that its request would produce excessive rates and limited any demand surge factor to no more than five percent of estimated losses.[88]

The Commissioner also commented in 2005 that estimates of demand surge that relied on Florida data from Hurricane Andrew and multiple hurricanes in the preceding two years were not a reliable basis for estimating demand surge in Massachusetts.[89] Both models that the MPIUA used to develop its 2007 rates included a demand surge factor; neither was quantified and the MPIUA provided no evidence on the effect of demand surge on the loss estimates produced by the models. In 2007, the Commissioner reiterated that a demand surge estimate founded on an

[84] Tr. Vol. IV, p. 70. Karen Clark also does not classify Irene, in 2011, as a hurricane. Tr. Vol. V, p. 17.
[85] *Id.*, p. 31
[86] Mr. Lalonde testified that the AIR model included an event like Irene in its stochastic storm set, even though it was not a hurricane in Massachusetts. Tr. Vol. VI, p. 29.
[87] Tr. Vol. VI, p. 37.
[88] The Commissioner concluded that a reasonable range for demand surge would be between one and five percent of losses. *Decision on 2005 Rates*, p. 30.
[89] The Commissioner reiterated that position in 2007. *Appendix to the Decision on 2007 Rates*, pp. 13-14.

analysis of loss data from Florida and other Southern states during unusual hurricane seasons is suspect as a basis for estimating demand surge in Massachusetts.[90]

Mr. Lalonde testified that the AIR modeled losses provided to the MPIUA included a demand surge factor estimated, on a statewide average, to increase losses by 5 to 19 per cent.[91] That range was not the result of applying the AIR model to the MPIUA's portfolio, but was generated by running the AIR model on AIR's own industry exposure database.[92] Mr. Lalonde testified that he could not identify what percentage of demand surge is included in the AIR model of the MPIUA losses because AIR ran its model for the MPIUA with the demand surge function on, and was not engaged to perform a second analysis without that function.[93] The AIR Brochure addresses demand surge function, but includes no quantitative values.[94]

Mr. Lalonde also testified that AIR validated its demand surge function by analyzing demand surge experience following the 2004-2005 Florida hurricanes, 2005 storm data from Louisiana and Mississippi, the Northridge earthquake in California, and Hurricane Andrew.[95] He opined that demand surge is an economic concept that is not necessarily data driven. For purposes of ratemaking, however, an economic concept, absent quantification based on data that is relevant to the events underlying the proposed rates and is demonstrated to be within a range of reasonableness, does not support the MPIUA's proposed rate increase.

To support its position that its rates fall within a range of reasonableness, the MPIUA has the burden to provide evidence quantifying the portion of projected hurricane losses that represents demand surge, demonstrating that the formula used to estimate a demand surge factor for Massachusetts is developed from data that reflect historical experience in Massachusetts, and showing that it has been appropriately applied to the MPIUA's book of business. The demand

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[90] *Appendix to the Decision on 2007 Rates,* p. 13.

[91] Mr. Lalonde testified that the demand surge factor could be more or less than that range, but had seen a factor of 11 percent for other large books of residential business and was fairly confident that it would not exceed 20 percent for the MPIUA. He commented, as well, that the demand surge factor is linked to the size of the loss, and would be higher for larger losses. Tr. Vol. VI, pp. 57-58.

[92] According to Mr. Lalonde, in order to develop the percentage of demand surge in AIR's model of the MPIUA's projected losses, it would have had to run the model with and without demand surge, and then calculate the difference. The MPIUA did not engage AIR to do a second run, so AIR provided a surrogate. Tr. Vol. VI, pp. 38, 55.

[93] Mr. Lalonde explained that running the model with and without the demand surge function is a simple process, but would involve additional time and expense. Tr. Vol. VI, p. 55.

[94] Hearing Exhibit 3, pp. 188-189. AIR states that its engineers and statisticians have developed a mathematical function that relates demand surge to the amount of modeled industry insurance losses from a particular event. The function, it states, is the result of over 15 years of research and refinement, and is based on historical data, statistical analysis, economic time-series reviews and analysis of construction-material and labor-cost data.

[95] Tr. Vol. VI, pp. 38-39.

surge factor should also be calibrated to ensure that it does not reflect claim payments for any type of losses that the MPIUA is unlikely to incur.[96]

The MPIUA has relied this year on modeled hurricane losses that include a demand surge factor that was neither quantified nor calculated according to the standards prescribed by the Commissioner in prior decisions. It has not provided sufficient evidence to persuade us that rates incorporating that factor will not be excessive.

b. Insured Loss Estimates

Mr. Lalonde confirmed that the AIR modeled losses for the MPIUA increased between 2009 and 2013 even though the MPIUA's estimate of its Total Insured Value ("TIV") decreased over that time period.[97] He attributed the increase in estimated losses, despite the reduction in TIV, to model changes relating to the hurricane frequency estimate for the Northeast and to other changes resulting from a better understanding of the effects of land cover and land use on wind speeds and on the reanalysis of issues relating to building vulnerability. Mr. Lalonde agreed, however, that no hurricane had occurred in New England between 2009 and 2013 and that there were no events that provided any additional data on the MPIUA's expected hurricane losses. In his opinion, the increases result from revisions to the model that are based on changes to the science underlying the model. [98]

AIR compares the model output for expected losses with historical loss numbers for hurricanes, based on data from Property Claims Service ("PCS"), an organization that surveys insurance companies after events to gather loss statistics and generate a view of industry loss.[99] Mr. Lalonde testified that AIR had received information from PCS on statewide losses from the two hurricane events that damaged insured property in Massachusetts: Gloria in 1985 and Bob in 1991.[100] AIR then trended those values forward to estimate losses from those events, had they occurred in 2011, by increasing the PCS numbers by 7 percent a year until 2008 and 4 percent a

[96] The *Appendix to the Decision on 2007 Rates*, p. 14, reported on testimony that a significant aspect of demand surge consisted of payment for additional living expenses that would be paid less frequently on a second home. The Commissioner noted that demand surge modelers do not make adjustments relative to the number of second homes compared to the number of primary residences in the exposure base.

[97] Hearing Exhibit 55. A comparison of the MPIUA's estimate of TIV in its 2009 Filing and its 2013 Filing shows a decrease of $8,145,794,427; a comparison of the AAL and LAE estimates in the two filings shows an increase of $7,828,032, from $33,416,480 to $41,244,512.

[98] Tr. Vol. VI, pp. 79-84. Mr. Lalonde could provide no details relating to the effect of particular changes in the model on the increased modeled losses. He agreed that it would be hard to understand a substantial increase in modeled losses without an underlying event, data or science that supported the change.

[99] Tr. Vol. VI, pp. 84-85. PCS is a Division of the Insurance Services Office.

[100] Those values were $42,500,000 for Gloria and $300,000,000 for Bob.

year thereafter.[101] Mr. Lalonde indicated that those percentage values represented annual averages that were based on general economic data and AIR's annual updates to its industry exposure data base, but that the actual result is judgmental.[102]

AIR also generated estimated losses from the same two historic hurricane events, Gloria and Bob, by applying Version 14 of its Hurricane Model for the United States to AIR's industry exposure base.[103] Application of the model to that database produced far higher estimates of Massachusetts hurricane losses.[104] Mr. Lalonde testified that for Gloria the modeled values were 180 percent higher than the PCS values, and for Bob were 82 percent higher. He had seen no analysis of the reasons for those differences. The Filing includes, in addition to AIR's projections of historical losses reported by PCS to 2011, testimony from Karen Clark.[105] Ms. Clark adjusted the PCS reported losses to 2012 dollars by applying factors developed by Roger Pielke (the "Pielke factors") for projecting historical loss data to current economic levels and also by applying her risk assessment tool, RiskInsight.[106]

The broad range of values generated by these approaches demonstrates no consensus on a generally accepted methodology for projecting the current value of historical insured losses as confirmation of the reasonableness of modeled values. Mr. Lalonde and Ms. Clark, for example, do not agree on the reliability of the PCS database as a resource; Ms. Clark starts her analysis by doubling PCS's values on the ground that they substantially underestimate losses for events occurring before 1995.[107] Pielke's work focuses on developing values for total economic damages related to hurricane landfalls.[108] It does not purport to measure insured losses to a

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[101] Tr. Vol. VI, pp. 84-89. Mr. Lalonde referred to the 7 and 4 percent as trend values, but later confirmed that they are values that AIR applied every year. The PCS results, as adjusted by AIR's percentages, were $226,629,184 for Gloria and $1,065,971,254 for Bob.

[102] Tr. Vol. VI, pp. 87-89. Mr. Lalonde, however, in response to questions about the increase in the model's estimate of hurricane losses from 2009-2013, testified that it would not be reasonable to assume a 6 percent increase in estimated losses from year to year, even though he thought it would not be unreasonable "[i]n terms of general increases that people see." Tr. Vol. VI, p. 81.

[103] Hearing Exhibit 58.

[104] The AIR model v. 14 produced values of $636,179,137 for Gloria and $1,942,070,839 for Bob.

[105] Mr. Ericksen characterized Ms. Clark's work as a reasonability check on the results of the AIR model. Tr. Vol. IV, p. 17.

[106] Hearing Exhibit 43. Ms. Clark, applying the Pielke factors, generated losses of $1,389,659,456 for Gloria and $1,564,278,380 for Bob. RiskInsight produced values of $4,600,000,000 for Gloria and $4,000,000,000 for Bob.

[107] Tr. Vol. V, pp. 116-120.

[108] Hearing Exhibit 36. Pielke, *et al.,* "Normalized Hurricane Damage in the United States: 1900-2005,**"** *Natural Hazards Review,* February, 2008, pp. 29-42. The three principal factors are national inflation, the growth in wealth per capita, meaning that people own more "stuff" than in the past, and population growth in coastal counties. The record includes no discussion of the extent to which these factors appropriately apply to estimating damages to the MPIUA's book of business in Massachusetts. Hearing Exhibit 36, p. 31.

particular book of business in any state.[109] We are not persuaded that any of these approaches support a conclusion that the increase in the AIR model's estimate of MPIUA losses is reasonable.

B. Reinsurance

Chapters 174A and 175A both identify catastrophe reinsurance among the factors that may be included in property insurers' rate filings; Chapter 152, §5(c) specifically requires the Commissioner to consider the effects of "predicted hurricane losses and the cost of catastrophe reinsurance on the rates charged by voluntary market insurers and the cost of catastrophe reinsurance and the predicted hurricane losses" on the MPIUA. The intervenors do not challenge the MPIUA's decision to purchase reinsurance targeted toward reimbursement for losses it might incur as a result of hurricanes. At issue is whether the MPIUA has supported its position that the reinsurance component of its proposed rates is reasonable. The MPIUA argues that its reinsurance costs are reasonable because the market for reinsurance is competitive and a competitive market produces products at competitive rates.[110] It asserts that there is no evidence in the record that solvent reinsurers would have sold reinsurance to the MPIUA at different prices. The MPIUA further contends that its filing on reinsurance costs fully complies with actuarial standards.

The AG contends that the MPIUA has not satisfied its burden of showing that the reinsurance costs in the rates are reasonable and not excessive. She asserts that those reinsurance costs reflect 34.4 percent of the premium on the homeowners' insurance forms in most territories, and 49.4 percent in Territory 37.[111] She points out that the Actuarial Standards of Practice do not require that reinsurance costs be included in rates.[112] The AG further observes that the rates currently in effect include an allowance of $13 million to cover the costs of

[109] Pielke, *et al.*, addressing the relationships between insured losses and total economic losses, comment that the National Hurricane Center often doubles insured loss estimates to reach total economic losses. However, it also points out that the relationship between "economic" and "insured" losses will vary depending on the extent of flooding and damage to infrastructure and uninsured properties in each storm. Hearing Exhibit 36, p. 30. According to Mr. Wackerman, there is a "wide range of viewpoints" on the effect of flooding on MPIUA losses. Tr. Vol. III, p. 68.

[110] Both of the MPIUA's witnesses on reinsurance, Mr. Ward and Mr. Wackerman, testified that the reinsurance market is competitive. Hearing Exhibit 2, p. 681; Hearing Exhibit 3, p. 274.

[111] Territory 37 consists of Barnstable, Dukes and Nantucket Counties. Barnstable County includes all of Cape Cod; Dukes County is Martha's Vineyard.

[112] Mr. Ericksen testified that reinsurance costs need not be included in rates, and that if they are included, the value could reflect some, but not all of those costs. Tr. Vol. IV, pp. 88-89.

reinsurance, and that the MPIUA currently funds reinsurance costs in excess of that allowance from its direct profit from policyholder premiums.[113]

The AG argues that the ceded losses in the Filing are inconsistent with the ceded losses included in the reinsurance coverage; she attributes that difference to the use by reinsurers of different models to estimate MPIUA losses that include estimates of non-modeled losses that the MPIUA did not include in its Filing. She contends that the MPIUA could not support the quantification of any of those non-modeled losses and therefore cannot show that they are reasonable. The AG asserts that applying the range of reinsurance profit and expense factors in Mr. Wackerman's testimony to the MPIUA's estimated value of ceded losses would generate a lower reasonable reinsurance cost.

Actuarial standards do not mandate inclusion of reinsurance costs in rates.[114] Previous Decisions and Orders on the 2005, 2007 and 2011 Fair Plan rate filings, and the *Appendix to the Decision on 2007 Rates*, addressed questions relating to reinsurance and established criteria for evaluating the MPIUA's reinsurance requests. Those decisions constitute the basis for analyzing the reinsurance provisions in the 2013 Filing.

1. Timing of the Reinsurance Purchase.

In addressing provisions for reinsurance costs in the Decisions and Orders on the 2005, 2007 and 2011 Rate Filings, the Commissioner determined that reinsurance provisions in the rates must reflect the costs that the MPIUA will pay during the period in which its requested rates will be in effect. Since 2005, in three of its five filings, the MPIUA has sought a December 31 effective date for proposed rates although it purchases reinsurance coverage for a year running from July 1 through June 30. The mismatch between a rate year that is concurrent with the calendar year and a reinsurance year that is based on a commonly used fiscal year was one basis for disapproving the MPIUA's 2011 filing.[115]

This year, the MPIUA sought to address the mismatch by submitting its Filing on April 12, 2013, with a proposed effective date of July 1. Mr. Wackerman, a reinsurance broker at Guy

[113] In her *Decision on 2005 Rates*, p. 26, the Commissioner found that, on the record that year, a value of $13 million for the net cost of reinsurance would fall within a range of reasonableness and would approve its inclusion in the rates if the insurance were in fact purchased. The MPIUA submitted a revised rate filing that incorporated that value for the cost of its reinsurance; that revised filing was thereafter approved.

[114] Paul Erickson, the actuarial witness for the MPIUA, testified that the actuarial standards of practice applicable to rate filings do not mandate the inclusion of reinsurance costs in the rate calculation but that the actuary may elect whether to do so and could also decide to include part but not all of the reinsurance costs. Tr. Vol. IV, pp. 88-89.

[115] The MPIUA's actual fiscal year runs from October 1 through September 30 of the following year.

Carpenter, testified that the MPIUA, in response to rejection of the reinsurance provisions in its 2011 Filing, decided to accelerate the renewal timeline for its 2013-2014 reinsurance program so that it would be bound before submission of the 2013 filing.[116] The 2013 Filing includes a value of $77,012,000 for the cost of catastrophe reinsurance to be in effect from July 1, 2013 through June 30, 2014.

Satisfying the Commissioner's requirement that the MPIUA's reinsurance expense align with the effective date of rates proposed for a customary one-year policy term would have succeeded only if the proposed rates were approved before July 1, 2013. The MPIUA's chosen filing date allowed only eleven weeks for completion of a proceeding that requires a public hearing and is otherwise analogous to the elements of a civil trial, including discovery, cross-examination, advisory filings in response to the MPIUA's Filing, subsequent cross-examination, briefs, and preparation of a written decision on a complex rate filing. In all probability, resolution of the matter within that eleven week time frame would realistically succeed only if the parties, as they did in 2009, settled contested issues and timely submitted a stipulation for the Commissioner's review.[117] The MPIUA's filing date, viewed in historical context, was an unreasonable, and ultimately unsuccessful, approach to effectuating a match between its 2013-2014 reinsurance expense and its proposed policy effective date.

2. The Scope of the Reinsurance Program

Even if the MPIUA had matched the reinsurance expense to the policy period, it must still meet its burden of proof on the reasonableness of its reinsurance costs. The Filing shows that for the twelve month period from July 1, 2013 through June 30, 2014 the MPIUA purchased five layers of reinsurance with a total maximum limit of $1.2 Billion, retaining responsibility for the first $200,000,000 of insured losses.

In 2007 the Commissioner found that the MPIUA must annually examine its reinsurance programs in light of its current circumstances and market conditions, including availability and price.[118] She concluded that its filing should substantiate the reasons for purchasing coverage at

[116] Copies of the agenda for the MPIUA Executive Committee meeting on November 13, 2012 and for the Board of Directors meeting on November 15, 2012, attached to Mr. Wackerman's testimony, confirm that approach.
[117] In 2009, the MPIUA made a filing on October 30 for a January 1, 2010 effective date. A stipulation was signed on January 6, 2010. With that exception, the historical record of proceedings on MPIUA rate filings post the 2004 legislation shows that contested proceedings were concluded in no fewer than six months. That record suggests that an 11-week timetable was inconsistent with past experience, and a risky strategy for ensuring a match between policy period and reinsurance expense.
[118] *Appendix to the Decision on 2007 Rates*, p. 5.

various levels and demonstrate that the premium, in light of prevailing market conditions, is reasonable.[119] Records attached to Mr. Wackerman's testimony document the MPIUA's process for purchasing reinsurance for 2013-2014.

At its November 15, 2012 meeting, the MPIUA Board (the "Board") granted MPIUA management the authority to purchase reinsurance reasonably consistent with the most recent prior year's programs, stating that it would ratify that purchase at its March 2013 meeting.[120] The Board meeting agenda for March 19, 2013, reports on MPIUA management's actions, beginning with issuance of a marketing letter dated December 17 [*sic*], 2012 and culminating in a request that the Board ratify management's proposal for purchasing reinsurance. In response to discussions with Guy Carpenter, MPIUA management issued Firm Order Terms ("FOT") for $1 billion in reinsurance, in five layers, at a cost of $77,012,000.[121] The agenda indicates that on February 5, 2013 MPIUA management approved final signed lines for reinsurance totaling $1,176,967,500 and asked that the Board ratify its purchase, as "consistent with the Board's long-term strategic reinsurance policy and its vote at its November 16 [*sic*], 2012 meeting."[122]

The Board's agenda does not reflect the final cost of the reinsurance purchase. Further, the record does not document a Board vote approving a specific cost for the 2013-2014 reinsurance program, either on March 19, 2013 or any subsequent date prior to April 12, 2013. The documentation relating to the 2013 reinsurance purchase omits, in addition to a stated cost for the reinsurance purchase, any evidence of the Board's review or analysis of management's recommendations, and raises questions about the MPIUA's compliance with the Commissioner's guidelines for determining its reinsurance needs and the cost of its coverage.

The record also does not reflect a careful analysis by MPIUA management of its specific reinsurance needs for 2013-2014. In 2007 the Commissioner noted that the MPIUA's

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[119] *Decision on 2007 Rates*, p. 4.

[120] The 2012-13 reinsurance program had a $200 million retention level and a $975 million upper bound on reinsurance for what the Board agenda for March 19, 2013 reports as a premium of $82,443,000. However, records of the MPIUA Executive Committee meeting for November 13, 2012 indicate that for 2012-2013 the MPIUA sought reinsurance coverage of $1 Billion but placed only 98.35 percent of that amount. Nevertheless, Hearing Exhibit 9, a document from Guy Carpenter directed to reinsurers, dated December 19, 2012, described the MPIUA's 2013-2014 program as having an upper limit of $975 million.

[121] The MPIUA defines FOT as Firm Order Terms; Mr. Wackerman defined it as the "final pricing." Tr. Vol. III, p. 56. The MPIUA subsequently asked the AG's witness, Mr. Schwartz, to define "firm offer terms," which he described as the "terms that the primary insurance company or the MPIUA goes to market with,… saying that this is what we want to pay for the reinsurance." Tr. Vol. VIII, p. 42.

[122] Guy Carpenter's December 19, 2012 letter to reinsurers also identifies the MPIUA's long-term reinsurance strategy as protection for its member companies and comments that the Board reviews that strategy annually. Hearing Exhibit 9, p. 3

examination should include issues of availability and price, an analysis of reinsurance in the voluntary market, and whether it is reasonable to purchase 100 percent reinsurance at the highest layers [*i.e.,* to cover the upper range of potential expected losses.] The Board agenda for its March 19, 2013 meeting indicated that the MPIUA management, sometime prior to December 2013, set the amount of reinsurance it sought to purchase at $975 million.[123] Guy Carpenter then sent out a marketing letter in January 2013, recommended FOTs that would purchase $1 billion in reinsurance for $77,012,000, a recommendation that MPIUA management authorized Guy Carpenter to present to reinsurers.[124] The cost of the coverage was approximately $5,431,000 less than the cost of the 2012-2013 program.

On February 1, 2013, Guy Carpenter proposed to MPIUA management that it "sign lines" for reinsurance with upper limits of $1,176,967,500, a value that is $1,967,500 in excess of the MPIUA's initial request and higher than the upper limit placed for 2012-2013.[125] Nothing in the record reports any discussion of the reasons for increasing the upper limits or any analysis of the effect on pricing if the reinsurance purchase were at the limits initially proposed.[126] The MPIUA records report no discussion of the percentage of reinsurance coverage that relates to modeled losses from events, such as Category 4 or 5 hurricanes, that have virtually no chance of occurring in Massachusetts.[127]

The absence of any discussion of the MPIUA's specific reinsurance needs is also of particular concern for other reasons: the reduction over time in the number of exposures written by the MPIUA, and the effect on the cost of reinsurance of an adjustment made to the valuation

[123] The $975 Million appears to represent the actual limits purchased for 2012-2013. The amount of reinsurance purchased for that year represents 98.35 percent of the $1 Billion dollar limit that the MPIUA initially sought. It is uncertain, on this record, whether the MPIUA initially fixed a budget item for reinsurance and then asked Guy Carpenter to embark on negotiations. Guy Carpenter evidently recommended FOT to MPIUA management in January 2013.

[124] Agenda for the MPIUA Board of Directors meeting on Tuesday, March 19, 2013, Hearing Exhibit 3, pp. 360-361.

[125] Hearing Exhibit 3, p. 362.

[126] Management's task with respect to the 2014-2014 reinsurance purchase, as described in documents related to its November 13, 2012 meeting was, among other things, to establish, in consultation with Guy Carpenter, retention and reinsurance layers consistent with prior practice and in accordance with the Board's Reinsurance Strategic Plan. Mr. Wackerman testified that he understood that the MPIUA Board authorized each year an item for the purchase of reinsurance, further describing a process in which the MPIUA evaluated the amount of limit needed, then chose to purchase a particular limit, and sought to place the limits in their entirety. However, Mr. Wackerman did not meet with the Board in connection with the purchase of its 2013-2014 reinsurance. The Commissioner has disapproved an approach to purchasing reinsurance that does not annually reevaluate the MPIUA's needs. *See Appendix to the Decision on 2007 Rates,* pp. 4-5.

[127] *See Appendix to the Decision on 2007 Rates,* p. 5, fn. 6.

of the MPIUA's exposures because of its decision no longer to add automatically to its policies a Coverage B value for "other structures" absent evidence that the property included any such structures.[128] Further, there is no evidence of any discussion of the event time period to be considered in estimating the MPIUA's reinsurance needs. According to Mr. Wackerman, the industry standard is to purchase reinsurance to cover one in a hundred year events; the MPIUA ultimately chose a program that would cover events expected to occur once in 117 years.[129] Mr. Lalonde, testifying on the conclusions generated by applying AIR's model to the MPIUA's exposures, indicated that losses for a 100-year return period would be $900.5 million, $75 million less than what the MPIUA initially sought to purchase in reinsurance.[130] The records of the MPIUA meetings report no discussion on the appropriate level of reinsurance in view of the AIR model results.

MPIUA management, on February 5, 2013, approved the purchase of reinsurance coverage totaling $1,176,967,500 and asked the Board to ratify that purchase, as "consistent with the Board's long-term strategic reinsurance policy." That policy, set out in full in the agenda for the Board's March 19, 2013 meeting, in relevant part states that the MPIUA's goal is to "Purchase Reinsurance Protection for the exposure and risk of a natural disaster borne by MPIUA's members…."[131] The effect of any increase in the upper limits of available reinsurance is to provide additional protection to MPIUA members from potential assessments. In 2007, the Commissioner concluded that "[a]n increase in FAIR Plan rates to reduce the likelihood of assessments on members for residual market losses is inconsistent with the legislative purpose to make basic property insurance available at a reasonable cost to eligible applicants in large share

[128] Testimony of Eileen Burke, Hearing Exhibit. 2, p. 387. Ms. Burke's testimony commented that the Coverage B adjustment was made for reinsurance purposes. Tr. Vol. II, p. 16. A marketing letter sent by Guy Carpenter to potential reinsurers indicates that the revised value was sent to potential reinsurers.

[129] Mr. Wackerman testified that the typical rule of thumb is to limit reinsurance at a 1 in 100 year event. Tr. Vol. III, p. 31. Mr. Lalonde's testimony on the selection of a 100-year return period is consistent with Mr. Wackerman's statement. Tr. Vol. VI, p. 92. Mr. Lalonde testified that it generally is correct that there is a direct relationship between the return period and the amount of losses from a hurricane; the greater the return period, the greater the probability of loss. Tr. Vol. VI, p. 91. The selection of a longer return period therefore may increase the estimated losses. The MPIUA offered no evidence for the ultimate decision to choose a 117 year return period. Although its strategic reinsurance policy states that "[t]he long-term program may attach as low as the one in ten year event level and cover up to a 150-year event," that policy does not relieve the MPIUA from demonstrating that its selection produces a reasonable cost of reinsurance.

[130] Hearing Exhibit 3, p. 43

[131] The December 19, 2012 letter from Guy Carpenter to the reinsurers, signed by Mr. Wackerman, confirmed the MPIUA's long-term strategy to maintain consistent protection for its member companies "for the exposure and risk of a natural disaster." It further commented that the MPIUA reviewed that strategy annually. Hearing Exhibit 9, p. 3.

territories."[132] The appropriate level for the MPIUA's reinsurance purchases should not be based on avoiding assessments on its members. The reduction in the cost of the MPIUA's 2013-2014 reinsurance program from the 2012-2013 program does not relieve the MPIUA from its obligation to demonstrate that it had a reasonable basis for increasing the overall amount of coverage.

3. Pricing the Reinsurance Program

In 2007, the Commissioner determined that the appropriate methodology for determining the net cost of reinsurance for inclusion in the MPIUA rates is to establish the portion of the net earned premium that represents an estimate of the reinsurers' profits and expenses.[133] That methodological approach was reaffirmed in 2011.[134] By regulation, the Commissioner's previous decisions on MPIUA filings have precedential value in subsequent proceedings.[135] The MPIUA argues that inclusion in its proposed rates of its expected reinsurance costs is consistent with general principles of property and casualty insurance ratemaking issued by the Casualty Actuarial Society.[136]

The MPIUA's burden in this proceeding is to demonstrate that the cost of each element incorporated into its proposed rates, including the cost of reinsurance, falls within a range of reasonableness.[137] Mr. Wackerman opined that the laws of supply and demand drive overall reinsurance pricing, and considered individual price components to be less significant. The AG argues that the reinsurance costs in the Filing are based on a mismatch between ceded loss values shown in the Filing and those used to develop the reinsurance costs. She further contends that the reinsurance cost, given the reinsurance profit and expense factors supplied by the MPIUA, is unreasonable and excessive.

Concluding that a price is "reasonable" requires evidence that it is calculated based on reasonable assessments of the risks that are reinsured and incorporates reasonable allowances for the reinsurers' profit and expenses. While a competitive market may effectuate some boundaries

[132] *Appendix to the Decision on 2007 Rates,* pp. 2-3.
[133] *Appendix to the Decision on 2007 Rates,* p. 5.
[134] *Order on the 2011 Filing,* pp. 21-22.
[135] 211 CMR. 101.04 (6).
[136] Hearing Exhibit 2, pp. 603-607.
[137] The MPIUA supports its position that it has met that standard by arguing that the SRB accepted the amount and price of the reinsurance purchase and that the AG offered no specific recommendations on reinsurance. Further, it asserted that the AG's witness had no relevant experience in pricing reinsurance. The SRB's witness stated that she accepted the price paid as an expense, but offered no opinion on the merits of that price. That neither intervenor quantified what might be a reasonable cost of reinsurance does not relieve the MPIUA of its burden.

on pricing, the mere presence of competition is uninformative on the evolution of particular prices and does not constitute evidence that the MPIUA's cost of reinsurance falls within a range of reasonableness.[138]

The MPIUA's purchase of reinsurance essentially transfers the risk of paying catastrophic losses above its retention amount to one or more reinsurers.[139] Rather than rely solely on data from historical hurricanes, it derives its estimate of those losses from the application of mathematical models developed by specialists to the MPIUA's actual book of business.[140] In his *Order on the 2011 Filing*, the Commissioner observed that the choice of models and the adjustments that reinsurers may make to them directly relate to the pricing of reinsurance, and that consistency between the MPIUA's hurricane loss estimates and those that reinsurers use to price their product is a sound basis for determining the reasonableness of the reinsurance factor in the rates. Consistent estimates of ceded losses establish a common platform for determining what portion of the MPIUA's reinsurance premiums represents potential loss costs and what portion represents reinsurer profits and expenses.[141]

In this Filing, the MPIUA relies on the output of a model developed by AIR to estimate its expected net hurricane losses.[142] Mr. Ericksen testified that in preparing the rate filing he relied exclusively on the results of the AIR model as his estimate of hurricane losses.[143] However, in connection with the reinsurance placement, Mr. Wackerman confirmed that Guy Carpenter provided the reinsurers with access to modeling files from both AIR and RMS.[144] He

[138] The MPIUA argues, in its brief, that even if it is possible to quantify reinsurer expenses and profits, they will vary widely among companies. Precisely because of that variation, an understanding of the portion of a quoted reinsurance premium that represents expenses and profits is relevant to determining whether pricing is reasonable. Mr. Wackerman testified that he did not actually discuss calculation of the reinsurance premium with the reinsurers and did not recall any discussions with the MPIUA on that subject.

[139] Mr. Wackerman testified that, although the MPIUA's reinsurance is not specifically limited to covering potential hurricane losses, it calculates its loss exposure based on such events. Tr. Vol. III, pp. 98-99.

[140] The Decisions on the 2005 and 2007 rate filings, and on the motion to dismiss the 2011 Filing, state that the MPIUA, in each of those years, incorporated into its filing modeled results from AIR and RMS. In 2007, it also obtained an estimate from a third modeler, EQECAT, but did not incorporate its results in the filing. The MPIUA did not directly contract with the modelers to run the models itself, but relied on its reinsurance broker, Guy Carpenter to do so.

[141] Reinsurers may not necessarily precisely agree on a value for estimated losses. However, in order to determine whether the reinsurer's price is reasonable, the pricing should disclose the factors that the reinsurer considers in determining the scope of the risk and confirm that its loss estimates are reasonably consistent with modeled losses that comply with the Commissioner's standards for hurricane modeling.

[142] That value is also the basis for estimating the LAE associated with hurricane claims.

[143] Tr. Vol. IV, pp. 12-13.

[144] Tr. Vol. III, p. 27, Exhibit 9. The MPIUA argues, in its brief, that it moderated its requested rates by choosing a hurricane loss provision that was based solely on the AIR model results to estimate average annual ceded hurricane

further testified that although Guy Carpenter provided the MPIUA's modeling information to the reinsurers, those entities do not necessarily rely on those results in pricing the reinsurance product.[145] Further, the record indicates that in pricing reinsurance reinsurers do not necessarily equate the term "expected ceded loss" to modeled hurricane losses. Mr. Ward testified that expected losses "could be a combination of any expected loss a reinsurer deems likely," further commenting that a reinsurer may have its own modeling capability that includes a variety of events that might result in losses.[146]

According to Mr. Wackerman, his inquiry into the allocation of reinsurance premiums to particular components of the pricing indicated that 20 to 27 percent of the premium was intended to cover modeled expected losses, including demand surge, and between 20 and 40 percent of the premium represented coverage for non-modeled losses. He identified a number of elements that might be included in non-modeled losses, noting that those actually considered in pricing would differ by reinsurer. Mr. Wackerman's list included LAE, inflation, insurance-to-value, growth, storm surge, standard deviation, Correlation Credit/Charge, regulatory coverage disputes and model uncertainty. He testified that he had no data supporting a particular value for any of these elements; his 20 to 40 percent estimate was derived from conversations with his colleagues at Guy Carpenter.

Because reinsurance is expected to compensate the MPIUA only for losses in excess of its retention level that are covered under the MPIUA insurance policy, the reinsurance pricing should reflect only those losses.[147] Further, in determining whether that pricing is reasonable, it

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losses. The MPIUA does not contend that it instructed Guy Carpenter to provide only those results to reinsurers or that it asked the reinsurers to comply with its chosen loss estimate in pricing reinsurance. Guy Carpenter's December 19, 2012 presentation to reinsurers noted that the RMS model included a data field for the square footage of the insured property, and that RMS assigned higher damageability rates to buildings of smaller square footages. It commented that because homes on Cape Cod are generally smaller than the industry average, the RMS model produced higher PMLs (Probable Maximum Losses). The MPIUA offers no explanation for providing the higher RMS results to the reinsurers while electing not to include them in their own rate calculations.

[145] Mr. Ward, addressing catastrophe model usage by reinsurers, testified that the world's largest reinsurer, Berkshire Hathaway, does not use any catastrophe models in developing its pricing.

[146] Mr. Ward testified that he did not know the identity of the reinsurers underwriting the FAIR Plan reinsurance program. Tr. Vol. I, p. 33. His testimony therefore provided no specific information on the pricing practices or use of models by the participants in that program.

[147] According to the AIR Brochure, "damage from storm surge can account for a significant portion of total hurricane losses." Hearing Exhibit 3, p. 144. It states that the model captures the effects of hurricane winds and storm surge on insured properties. However, water damage from storm surge is not necessarily covered under the MPIUA policy. Mr. Wackerman testified that there is a wide range of viewpoints as to the effect of storm surge on MPIUA losses. He thought it "possible, but unlikely" that as much as 40 percent of the MPIUA's reinsurance premium would represent storm surge. He further opined that such a percentage would probably be unreasonable, but that 20 percent would get into "a range of uncertainty." Tr. Vol. III, pp. 68-69. Any estimate of hurricane losses

is appropriate to understand both the factors that a reinsurer considers and the reasonableness of the estimated values for each.[148] In her *Decision on 2005 Rates*, the Commissioner observed that "[t]o ensure that rates are not excessive, a filer must demonstrate that its provisions for non-modeled losses are reasonable."[149] That principle is equally applicable to ensuring that the reinsurance cost included in the MPIUA's Filing is reasonable. Absent from the record is any evidence reasonably quantifying the percentage of the MPIUA's reinsurance premiums that reflects non-modeled losses, or supporting the reasonableness of the value assigned to any component of those losses.

Without reliable data on the portion of the reinsurance premium that represents coverage for both modeled and non-modeled potential losses, the portion of reinsurance premiums that reflect reinsurer expenses and profit loads cannot be quantified. Mr. Wackerman, in his written testimony, estimated that reinsurer expenses represented between 5 and 15 percent of premium; federal excise taxes, if applicable, about 1 percent; and commissions about 10 percent.[150] His estimate of reinsurer underwriting expenses was based on internal discussions at Guy Carpenter; he agreed that an estimate of approximately 8 percent, based on information in *Best's Aggregates*

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that the MPIUA uses to support any aspect of its rate request will produce excessive rates unless the MPIUA demonstrates that any storm surge factor has been adjusted to eliminate damage that is not covered under the MPIUA policy. As for other potential factors that reinsurers may consider in estimating risk, Guy Carpenter's December 19, 2012, presentation to the reinsurers stressed the effectiveness of the MPIUA's insurance to value programs and efforts to control LAE. Assuming, *arguendo*, that those representations are accurate, it would be unreasonable for a reinsurer to consider concerns about the MPIUA's insurance to value or the quality of its LAE control programs as factors that would increase the cost of reinsurance.

[148] For example, while it is customary to add a factor for LAE to the cost of the modeled losses, it is reasonable to expect the factor chosen by a reinsurer to be consistent with that utilized by the MPIUA. In this Filing, the MPIUA's chosen value for LAE is 10 percent of the modeled losses. Mr. Wackerman testified that reinsurance pricing might reflect LAE of 20 percent or more. While he considered 20 percent to be a reasonable level, it is possible that reinsurers could include a much higher value. Tr. Vol. III, p. 71. Mr. Wackerman also testified that a factor for inflation is similar to demand surge. Tr. Vol. III, p. 73. However, if the modeled losses include demand surge, any additional factor imposed by a reinsurer would be duplicative. Any factor for inflation included in the reinsurers' pricing should be carefully examined and documented.

Mr. Wackerman testified that he was aware that the MPIUA's exposure volume had been decreasing. Tr. Vol. III, p. 75. However, his December 19, 2012, presentation to reinsurers does not reflect that decrease. Exhibit 9 to Hearing Exhibit 9. Other factors that Mr. Wackerman lists, such as model uncertainty and standard deviation, are both unquantified and duplicate factors that are reflected in the risk load/underwriting profit portion of the reinsurance costs. Mr. Wackerman also posited various circumstances that might increase the MPIUA's losses, such as closure of bridges to Cape Cod, but offers no analysis, based on historical data, to support the effect of such events. He also commented that the MPIUA's reinsurance covers catastrophes other than hurricanes, but offers no evidence that such events, if they occurred, would result in losses over the MPIUA's retention limit.

[149] *Decision on 2005 Rates*, p. 29.

[150] Exhibit 3, p. 281. Reinsurance placed with Lloyd's has a 15 percent commission rate.

and Averages, was within a reasonable range.[151] He also testified that Guy Carpenter has a standard 10 percent commission charge for the MPIUA.[152]

Mr. Wackerman estimated that reinsurers included in their pricing an "implied risk charge" of between 15 and 35 percent.[153] He described that factor as "roughly equivalent to the concept of an underwriting profit provision in insurance ratemaking," further defining it as the difference between expected premiums and expected losses, expenses and commissions.[154] The implied risk charge, Mr. Wackerman commented, compensates reinsurers for underwriting risk, the extreme uncertainty and variability in potential losses, a return on equity, the cost of debt, and premium taxes, and will be different for each insurer. Mr. Wackerman's estimate of the portion of reinsurance pricing that represents the implied risk charge reflects a range of 20 percentage points. Depending on the selected percentage, the amount of reinsurance premium dollars that represent profit could differ significantly.[155]

We find no reason to abandon the Commissioner's conclusion that a reasonable methodology for estimating the cost of reinsurance that should be included in the MPIUA rates is to determine the portion of that cost that represents the reinsurers' expenses and underwriting profit.[156] Ultimately, determining whether those values fall within a range of reasonableness requires information both on the baseline data (*i.e*. the estimated value of the MPIUA expected hurricane losses, its chosen retention level and the ultimate value of the losses that are ceded to the reinsurers) and the reinsurers' approach to assessing the risks they are assuming that are the basis for developing reinsurance premiums, and the percentages added to those premiums that represent the particular reinsurer's expenses and underwriting profit. The Commissioner, in 2011, concluded that consistency between the MPIUA's hurricane loss estimates and those that

[151] See Hearing Exhibit 12 and Tr. Vol. III, pp. 79-80.
[152] *Id*., p. 80.
[153] Hearing Exhibit 3, p. 281.
[154] *Id*., p. 280.
[155] Mr. Wackerman attached to his testimony two documents that, he concluded, "suggest, at least, that the returns actually obtained by reinsurance companies as a whole are reasonable." Hearing Exhibit 3, p. 282. For rate approval purposes, the question is whether the profit factor in the reinsurance premiums charged by the companies that actually reinsure the MPIUA is reasonable.
[156] That position was reiterated in the *Order on the 2011 Filings*, p. 21. The MPIUA, apparently responding to a comment in that decision on Mr. Wackerman's testimony that he had not discussed reinsurers' expenses or profit loads with them, this year offered testimony that he had conducted a "verbal" survey of reinsurers on whether the cost of the MPIUA's reinsurance was reasonable, and that they answered "Yes." See Hearing Exhibit 11. The survey does not rise to the level of credible evidence on reinsurer expenses or profit margins.

reinsurers use to price their product is a sound basis for determining the reasonableness of the reinsurance factor in the rates.

The record does not permit a conclusion that reinsurers writing the MPIUA's reinsurance for 2013-2014 adopted that principle for purposes of pricing the coverage. Even if they had relied solely on the MPIUA's estimated ceded losses as a basis for pricing reinsurance, the MPIUA did not offer sufficient reliable evidence to quantify those portions of the premiums quoted to the MPIUA that represent expenses and underwriting profit.[157] We find that the MPIUA Filing does not support the cost of reinsurance included in its rate request.[158]

III. Conclusion

We find that the MPIUA, on two significant aspects of its Filing, failed to meet its burden of proof: to provide sufficient evidence to demonstrate that the values for hurricane losses and to demonstrate that the cost of reinsurance that were incorporated into its proposed rates fall within a range of reasonableness and will produce rates that are not excessive. The factors that the Commissioner considers in evaluating those aspects of the Filing have been identified in prior proceedings on MPIUA rates. Rather than address those factors, the MPIUA has continued to utilize a hurricane model that has not been shown to produce results that meaningfully reflect the frequency and severity of storms that are correctly classified as hurricanes in Massachusetts, develop measures of vulnerability that are specific to Massachusetts, and quantify other factors, such as demand surge, that might affect hurricane losses. With respect to reinsurance, the MPIUA submitted its Filing on a schedule that would not, realistically, permit an alignment of its rate year with its reinsurance year. The record does not demonstrate that the MPIUA engaged in a meaningful process to determine its reinsurance needs or that it required consistency between modeled expected losses and the reinsurers' estimates of such losses.[159] The Filing does not respond to the Commissioner's determination that the net cost of its reinsurance should be based

[157] Mr. Ward did not know how much of the MPIUA's reinsurance premium represents ceded losses and how much represents profit or risk load. Tr. Vol. I, p. 31. Mr. Wackerman provided no specific information on the expense ratio or underwriting profit for any of the reinsurers writing the MPIUA's 2013-2014 coverage.

[158] Our disapproval of the MPIUA's proposed cost of reinsurance does not eliminate any provision whatsoever for that cost in the rates. In her *Decision on 2005 Rates*, the Commissioner allowed the MPIUA to submit a revised Filing that could include $13 Million specifically to cover a portion of its reinsurance premium. A revised filing incorporating that value was approved on August 11, 2006. The 2013 Filing does not acknowledge that the allowance for reinsurance in the MPIUA's current rates equals approximately 19 percent of its proposed reinsurance expense.

[159] The concept of consistency does not imply approval of the modeled hurricane losses that are a basis for the MPIUA's proposed rates.

on the transaction costs associated with the reinsurance purchase, specifically what the reinsurers reasonably require to cover expenses and earn a profit. We therefore disapprove the MPIUA's 2013 Filing. Although our Decision does not address every aspect of the Filing, we remind the parties that the omission of any discussion on a particular element of the ratemaking process does not constitute approval of any party's position or permit an inference that the element is approved.

Dated: June 5, 2014

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Stephen M. Sumner Jean F. Farrington

I have reviewed the record and the decision of the presiding officers and approve their findings and conclusions.

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Joseph G. Murphy
Commissioner of Insurance

Dated: June ____, 2014

Please note that this decision may be appealed pursuant to Massachusetts General Laws Chapter 30A.