



Level 4 ± This information is necessary to continue the review of a model where concerns have been raised and not resolved based on the information in Level 1, Level 2, and Level 3. This most granular level of detail is addressing the basic building blocks of the model and does not necessarily need to be included by the filer with the initial submission unless specifically requested by a particular state. It is typically requested only if the reviewer has serious concerns that the model may produce rates or rating factors that are excessive, inadequate, and/or unfairly discriminatory.

Appendix B GAM is focused on Generalized Additive Models (GAMs). This appendix should not be referenced in the review of other model types. GAMs have significant differences from GLMs. This Appendix B is intended to provide state guidance for the review of rate filings based on Generalized Additive Models

A. SELECTING MODEL INPUT

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Section	Information Element	Level of Importance to the 5 H J X O [ Review	Comments
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Section	Information Element	Level of Importance to the 5 H J X O Review	Comments
A.1.c	Review the geographic scope and geographic exposure distribution of the raw data for relevance to the state where the model is filed.	2	

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Section	Information Element	Level of Importance to the 5 H J X O Review	Comments
3. Adjustments to Data			

A.3.a Determine if premium exposure, loss, or expense data were adjusted (e.g., developed, trend adjusted for catastrophe experience, or capped) so, how? Do the o ium2 (s272.8r)-3.99var(,)3

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A.3.e

B. BUILDING THE MODEL

Section	Information Element	Level of Importance to the 5 H J X O Review	Comments
1. High-Level Narrative for Building the Model			

B.1.a Identify the type of model underlying the rate filir (e.g., GAM, GLM, decision tree, Bayesian GLM gradient bort\_6.52 215.5flgbochin998 (BLM)5.9



Section	Information Element	Level of Importance to the 5 H J X O Review	Comments
B.1.d	Obtain a brief description of the development process, from initial concept to final model and filing rating plan.	1	The narrative should have the same scope as the filing.
B.1.e	Obtain a narrative on whether loss ratio, pure premium, or frequency/severity analyses were performed and, if separate frequency/severity modeling was performed, how pure premiums were determined.	1	



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Smooth functions are based on a sum of basis functions. The company should provide the number of basis functions for each smoothed variable and discuss how the number was chosen

B.4.d	For all smoothed variables, request details about the basis functions comprising each smoothed function	4 or 2	
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variables, the reviewer may obtain, for each disc variable level, the parameter values for parametric terms, plots representing smoothed terms, confidence intervals, chi-square



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B.4.i	Obtain a description how the model was tested for stability overtime.	2	Evaluate the build/test/validation datasets for potential time-sensitive model distortions (e.g., a winter storm in year 3 of 5 and distort the model in both the testing and validation datasets). Obsolescence over 8 (olclr2 0 Tw 355.06>nce )-440e







Section	Information Element	Level of Importance to the 5 H J X O D Review	Comments
2. Relevance of Variables and Relationship to Risk of Loss			
C.2.a	Obtain a narrative regarding how the characteristics/rating variables included in the filed rating plan relate to the risk of insurance loss (or expense) for the type of insurance product being priced.	2	<p>The narrative should include a discussion of the relevance each characteristic/rating variable has on consumer behavior that would lead to a difference in risk of loss (or expense). The narrative should include a rational relationship to cost, and model results should be consistent with the expected direction of the relationship.</p> <p>Note: This explanation would not be needed if the connection between variables and risk of loss (or expense) has already been illustrated.</p>
3. Comparison of Model Outputs to Current and Selected Rating Factors			

C.3.a









Section	Information Element	Level of Importance to the 5 H J X O D Review	Comments
8. Accurate Translation of Model into a Rating Plan			
C.8.a	Obtain sufficient information to understand how the model outputs are used within the ratings system and to verify that the rating SO D rating, in fact, reflects the model output and any adjustments made to the model output.	1	7 K H U H J X O D W R U F D Q U H Y L H Z see that modeled output is properly reflected in P D Q X r D e s , f a c t o r s , e t c .
9. Efficient and Effective Review of Rate Filing			