

Canada's OSFI drafts model risk guideline covering AI and machine learning models

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Letter Title Guideline E-23 – Model Risk Management (2027) - Letter

Category Sound Business and Financial Practices

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Sector Banks Foreign Bank Branches Life Insurance and Fraternal Companies Property and Casualty Companies Trust and Loan Companies

Today, we are publishing Guideline E-23 – Model Risk Management, which will take effect for all Federally Regulated

Financial Institutions (FRFIs) on May 1, 2027.

We published a draft revised Guideline E-23 on November 20, 2023, for public consultation until March 22, 2024.

The revised draft included several changes relative to the 2017 Guideline E-23 – Enterprise-Wide Model Risk Management for Deposit-Taking Institutions. While many of the draft revisions remain as part of the final guideline, several updates have also been incorporated in response to feedback provided by stakeholders. For details, please

refer to the summary of stakeholder comments and our responses.

Since the release of the draft guideline, we continue to observe growth in the use and complexity of models at FRFIs. As such, the expansion of the guideline's scope of application to all models at all FRFIs remains in place as a

key revision. However, application of the guideline to Federally Regulated Pension Plans (FRPPs) has been reconsidered given differences in our mandate to supervise FRPPs and the availability of alternative industry guidance addressing pension risk management. Other important revisions provide added context and clarity for Artificial Intelligence and Machine Learning (AI/ML) model risk management.

Should you have any questions, please contact Christopher Hutny (christopher.hutny@osfi-bsif.gc.ca), Senior specialist, Banking Capital and Liquidity Standards Division, Risk Advisory Hub.

Sincerely,

Guideline E-23 – Model Risk Management (2027) - Letter Page 1 Office of the Superintendent of Financial Institutions Amar Muniappalle

Executive Director, Risk Advisory Hub

Summary of stakeholder comments and our responses

Model definition and scope

Stakeholder feedback Our response

Stakeholders noted that the definition of a model is We have left the definition intentionally broad in the final too

broad and should be narrowed. guideline. Institutions are expected to identify models and manage model risk commensurate with the model risk rating.

Stakeholders asked for clarity on whether low/non- We have enhanced certain portions of the final guideline to risk use cases built from a generative AI model such provide some additional clarity on how it should be applied to as the use of ChatGPT for document summarization AI/ML models. Still, institutions are empowered to make risk- or marketing emails can be excluded from the intelligent decisions, based on the application of the model requirements for managing critical/high risk models. within the organizational context, when establishing model risk ratings.

Stakeholders asked if all models will be in scope, We have expanded guidance around model identification, regardless of the risk rating. including expectations for an institution's model inventory. Only models that carry risk to the institution need to be captured on the model inventory and are subject to full model lifecycle governance under the final guideline.

Stakeholders asked how far downstream should risks We have simplified our principles in the final guideline to be considered. remove the explicit reference to downstream risks. Institutions should determine what constitutes a reasonable amount of downstream impact based on the risk rating of the model.

Stakeholders requested clarity on what is considered We have updated the final guideline to no longer distinguish a new model. "new" models.

Stakeholders requested clarity on the term "model We have updated the final guideline to enhance clarity, and risk drivers", as it is not a defined term in the draft removed the reference to "model risk drivers". guideline and there are no defined drivers of model risk.

Stakeholders requested clarity on the term "risk We have updated the final guideline to enhance clarity, and classification" which is not defined and asked whether removed the reference to "risk classification". the reference should be to the risk rating.

Guideline E-23 – Model Risk Management (2027) - Letter Page 2 Office of the Superintendent of Financial Institutions Implementation date

Stakeholder feedback Our response

Stakeholders noted that the proposed twelve-month We have revised the implementation date to May 1, 2027. implementation period was too short. They requested Many institutions signaled that they have already begun work extending the implementation period to three years. on the model risk management reforms outlined in the draft guideline.

Proportionality

Stakeholder feedback Our response

Stakeholders requested clarity on We have revised the application of the final guideline to clarify that it applies on a how proportionality should be risk-basis, proportional to the institution's size, strategy, risk profile, nature, scope, considered. and complexity of operations, and interconnectedness.

Artificial intelligence and machine learning

Stakeholder feedback Our response

Stakeholders requested more guidance on We have incorporated additional explainability guidance in the explainability. final guideline throughout the components of the model lifecycle.

Stakeholders requested more guidance on self- We have incorporated additional guidance in the final guideline learning models, specifically with respect to how around model modifications under model identification, model the model modification approval requirement can review, and model monitoring. Institutions should establish be satisfied for models that are always changing. internal criteria to determine when a self-learning model has materially changed.

Guideline E-23 – Model Risk Management (2027) - Letter Page 3 Office of the Superintendent of Financial Institutions Third-party vendors

Stakeholder feedback Our response

Stakeholders requested more specific guidance on We have added guidance in the final guideline on the expectations for managing third-party black-box management of third-party models. Institutions should comply models. with third-party risk management principles established under guideline B-10 Third-Party Risk Management. Institutions should also ensure that third-party models receive validation and monitoring commensurate to the model risk.

Stakeholders requested a grace period within the We have not incorporated a grace period for third-party model guideline, allowing institutions to validate third-party risk management in the final guideline. However, institutions model updates after they have been deployed, may still establish an exceptions policy under which models considering that institutions may have limited control can be used for limited and specific applications prior to the over third-party models. completion of validation.

Stakeholders requested clarity around fourth-party We did not make any specific revisions to the final guideline to model risk management. For example, if an institution account for fourth party models. Institutions have a contracts with a third party that integrates generative responsibility to ensure that third-party model use is within AI functionality derived from a fourth party model, the institution's risk appetite limit. A third-party model review stakeholder would like clarity on whether this fourth- should include inputs into the model, including feeder models. party model should be considered within the It is up to the institution to determine whether the risks institution's model risk framework. involved with using a third-party model are appropriate for the business context.

Stakeholders requested clarity with respect to vendors We did not make any specific revisions to the final guideline to unwilling to share the appropriate level of account for, or accommodate, unwilling vendors. It is up to documentation. each institution to ensure adequate documentation is provided by vendors to satisfy model risk management needs.

Stakeholders requested clarity around the governance We updated the final guideline to reference "black box" of third-party "black box" models. models in some areas but we did not make any specific revisions or exceptions relating to governance of third-party "black box" models. We expect all institutions to have a framework in place for the governance of all third-party models. Institutions should decide for themselves how to structure the third-party model governance in a way that reflects the institution's risk appetite.

Guideline E-23 – Model Risk Management (2027) - Letter Page 4 Office of the Superintendent of Financial Institutions Stakeholder feedback Our response

Stakeholders noted that validating certain models is We did not make any specific revisions to the final guideline to challenging when advanced vendor products with account for vendors with proprietary techniques or data. proprietary techniques and big/dynamic external Institutions should have controls to assess whether the vendor training data are used. solution is producing an appropriate response.

Stakeholders noted that organizations using third- We agree with this observation and have included it in the final party libraries, platforms, and/or automated guideline. development processes used for model development, should be subject to independent review/validation, commensurate with the risks these elements present.

Stakeholders noted that some model governance We did not make any specific revisions to the final guideline to requirements may be difficult to meet for third-party reduce expectations regarding third-party models. The models (for example, data requirements, intention is for institutions to establish policies for reviewing development environment, and model architecture). and monitoring third-party models in a way that effectively They suggested that development requirements be manages its model risk. reduced, and model review requirements increased.

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Stakeholder feedback OSFI response

Stakeholders requested clarity on any distinction We use the term "validation" in the final guideline but note between the terms "validation" and "review". that it would be interchangeable with the term "review". The intent is for models to have independent reviews commensurate with the model risk rating.

Stakeholders noted that for some institutions, the We did not make any revision in the final guideline to specify number of models could number in the hundreds and the frequency of model reviews. As noted in our draft

validation of all would be onerous. They asked for guideline, the model risk rating should drive the frequency, clarity on an appropriate model review frequency, intensity, and scope of model review and redevelopment.

Stakeholders asked if targeted validation would be We did not make any specific revisions in the final guideline to acceptable, rather than validation of the whole model. accommodate more targeted or reduced-scale validations. However, we note that the scope of model review should be driven by the model risk rating.

Stakeholders requested clarity around expectations We have added some special considerations for artificial for generative artificial intelligence models compared intelligence models throughout the final guideline. However, to traditional quantitative models. the outcomes and principles provided in the guideline do not vary based on the algorithmic approach to modeling.

Stakeholders asked if validation must be performed by We revised the final guideline to remove references to a home office, or if it could be provided by other “home office”. Institutions should specify which units or stakeholders. individuals are responsible for model reviews in the institution’s model risk management framework.

Guideline E-23 – Model Risk Management (2027) - Letter Page 6 Office of the Superintendent of Financial Institutions Data lineage

Stakeholder feedback Our response

Stakeholders noted that with many We did not make any specific revisions in the final guideline regarding data systems in an institution, data traceability of model data. As good practice, institutions should understand lineage across all will be challenging. how the data that is used for modeling is captured and the transformations Stakeholders also requested clarity on that are applied on the data prior to modeling. We expect that the rigour the degree of traceability needed for involved in defining data lineage will be commensurate with the model risk data lineage. rating and the relative importance of data elements within the model.

Stakeholders asked if data lineage We did not make any specific revisions in the final guideline regarding should be assessed separately from traceability of model data as this is not within the scope of this guideline model risk. which is focused on model risk management. Data, including data accuracy, lineage, representation, and timeliness, should be assessed as a factor of model risk.

Guideline E-23 – Model Risk Management (2027) - Letter Page 7 Office of the Superintendent of Financial Institutions Model lifecycle

Stakeholder feedback Our response

Stakeholders requested clarity on governance and We did not make any specific revisions in the final guideline maintenance expectations for models that are not regarding governance expectations for decommissioned models. in use. They asked whether requirements for We agree that parallel runs are one effective approach to support parallel runs would be more appropriate. the transition from one model to its replacement. As noted in the final guideline, we expect institutions to retain the decommissioned model and documentation for a defined period so it can serve as a benchmark or contingency fallback.

Stakeholders requested clarity regarding how We have retained language in the final guideline on approvals “Approval requirements should apply throughout a throughout the model’s lifecycle. Still, institutions have the model’s lifecycle, including for modifications and flexibility to design their own model governance process and periodic reviews.” They asked for clarity on whether determine at which stages approvals are needed. To enhance institutions should perform one comprehensive clarity, approvals should be obtained prior to the implementation model approval after validation and before of a model change and following periodic reviews to ensure the deployment or whether the term “throughout” is model remains fit for purpose. There could also be other used to indicate that approvals are needed at all situations that merit an approval within the model lifecycle, for key stages of model development, including example, when there is a system change that was not driven by independent review before approval. the model but there is a need to ensure the model is still working properly.

Stakeholders noted that identification of all We have amended the language in the final guideline by removing stakeholders is a high threshold and that it may be “all stakeholders” and replacing it with “model stakeholders”, a difficult to ascertain all stakeholders at the term defined in the list of key terms. beginning, when defining the rationale for modeling.

Stakeholders noted that many models are not in We did not make any revisions in the final guideline to limit

production for continual usage but are just used to application to single-output or periodic-use models. Institutions produce a single output or on a periodic basis. should pay special attention to models that are used outside of a They recommended that the Model Deployment production environment. The risk rating of the model may be section be exclusively applicable to "high higher than originally expected, as controls that are implemented availability" models. in a production environment may no longer act as a risk mitigant.

Stakeholders noted that the model lifecycle does We have removed references in the final guideline to the circular not allow for dynamic recalibration or other model lifecycle to support innovative development paths. differentiations in model management.

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Stakeholder feedback Our response

Stakeholders recommended a new Although there is no specific section on related guidance, we have included section be added on related guidance, references and links in the final guideline to other related guidelines. and expectations on how this guideline interacts with other guidance.

Stakeholders requested clarity on the We did not make any revisions in the final guideline to establish measures or level of consistency and/or replication thresholds for data consistency between development and production needed between data used in environments. Reproducibility between development and production data development and the production data should be assessed during model review. Institutions should have differing set. expectations of what is acceptable depending on the risk rating of the model.

Stakeholders requested clarity on We did not specify responsibilities for coding within a production system in whether model developers should be the final guideline. Effective model deployment should involve collaboration responsible for coding within among model developers, model owners, model users, and enterprise production systems. technology or operations teams.

Stakeholders requested clarity on the We updated the language in the final guideline to clarify that all externally intention behind having specific, developed models should be assessed for model risk ratings on a standalone standalone model risk ratings for the basis. The model risk rating assigned to models developed by an external models supplied to subsidiaries / party (that is, parent organization) may not reflect the risk to the subsidiary foreign branches. or foreign branch.

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