



## 50 - Targeting Risk and Improving Controls Under US GAAP Targeted Improvements

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# 50 – Targeting Risk and Improving Controls under GAAP Targeted Improvements

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# Agenda



Overview

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Data and assumptions

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Modeling and validation

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Output and reporting

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We expect audience participation for several case study topics

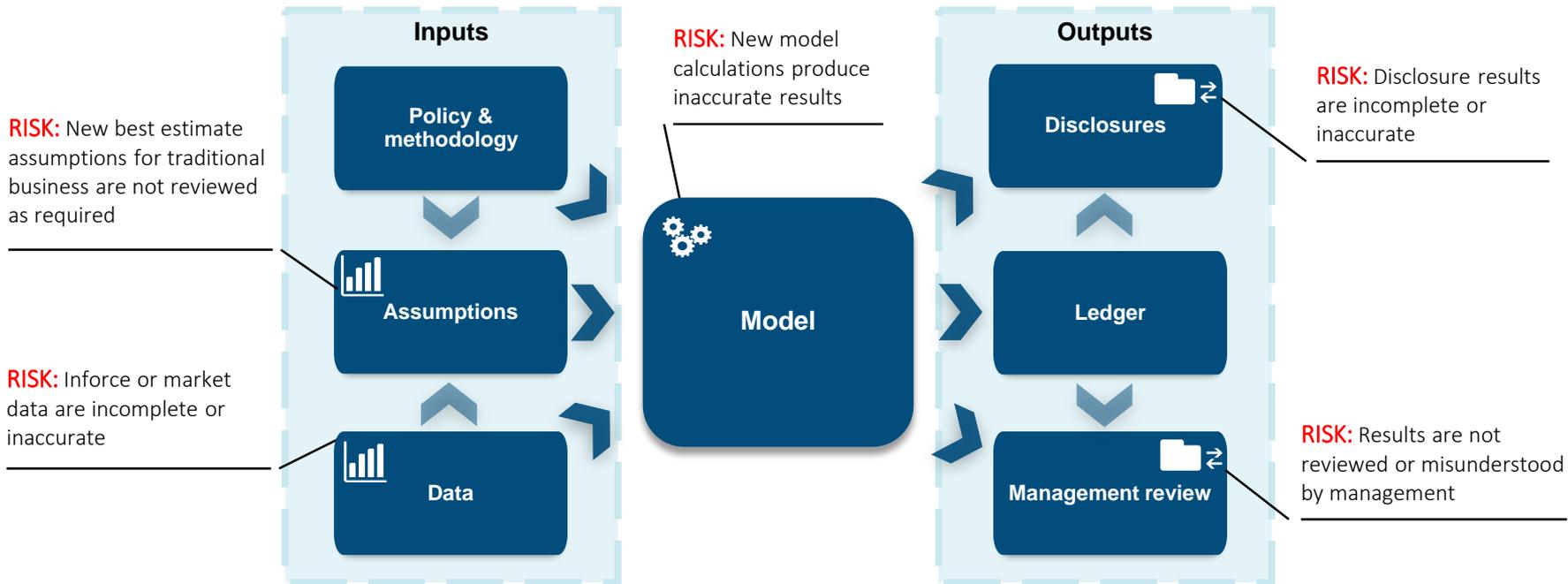
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# Summary of LDTI changes

	DAC	Traditional liabilities	Market risk benefits	Disclosures
UL type	✓	✗	✗	✓
Market based guarantees	✓	✗	✓	✓
Long duration traditional type	✓	✓	✗	✓
	<ul style="list-style-type: none"> <li>• “Straight-line”</li> <li>• No longer tested for impairment</li> <li>• No shadow OCI</li> <li>• Similar changes to “DAC-like” balances</li> </ul>	<ul style="list-style-type: none"> <li>• Unlocking</li> <li>• Best estimate assumptions</li> <li>• Market bond yield discount rates<sup>1</sup></li> <li>• Interest rate risk to OCI</li> </ul>	<ul style="list-style-type: none"> <li>• All other-than-nominal market risks that provide protection to contract holder measured at fair value</li> <li>• Instrument specific credit risk to OCI</li> </ul>	<ul style="list-style-type: none"> <li>• DAC and liability roll-forwards</li> <li>• Assumptions updates and judgements</li> <li>• LRT/NP cap details</li> <li>• And more...</li> </ul>

<sup>1</sup> Cash flows are discounted using upper-medium grade (low credit risk) fixed-income instrument yields.

# Actuarial process risk



# Opportunities for improvement with LDTI

## Data and assumptions



- Modernize data architecture and processes to extract, transform, and load
- Refine assumptions and align with other projection bases

## Modeling and validation



- Enhance model functionality, remove simplifications, and adopt new software features
- Review modeling standards and methodology decisions

## Output and reporting



- Streamline reporting process and minimize downstream processing
- Enhance business decisions through strategic analytics

# Data and assumptions



# LDTI data and assumption updates

DAC	Traditional Liabilities	Market risk benefits
<ul style="list-style-type: none"><li>• Update data feeds and assumptions to reflect actual and projected persistency experience</li><li>• AGPs are no longer needed in DAC data feeds</li><li>• Add input fields to facilitate policy grouping (if applicable)</li><li>• Make similar updates for unearned revenue and deferred sales inducements</li></ul>	<ul style="list-style-type: none"><li>• Incorporate actual experience to date in data feeds</li><li>• Add input fields to facilitate policy grouping</li><li>• Update assumptions to reflect current best estimates with annual revisions (ensure assumption revisions are recorded and maintained)</li><li>• Eliminate PADs for traditional products</li><li>• Discount using upper medium grade bond yields</li><li>• Reflect claim processing as only administrative expense in reserves</li></ul>	<ul style="list-style-type: none"><li>• Incorporate required market data for newly classified MRB / fair value benefits in in-force feeds</li><li>• Gather inception to date data and produce valuations</li><li>• Store attributed fee ratios, if applicable</li><li>• Refresh market inputs to stochastic scenarios used for valuation</li></ul>

# Data automation

You asked your IT department to set up an automatic feed to provide actual historical cash flows to your valuation model. They plan to test the feed by running the process with the existing data from multiple prior periods.

What are the key risks, potential impacts, and controls that can help mitigate?



# Data automation

You asked your IT department to set up an automatic feed to provide actual historical cash flows to your valuation model. They plan to test the feed by running the process with the existing data from multiple prior periods.

## Risk

In a live cycle, some of the data isn't generated until after the feed is scheduled to run

## Impact

Production cycle is delayed due to missing data.  
Inaccurate results flow through to financials undetected

## Controls

### Preventative

- Run a test cycle in parallel to production with live data

### Detective

- Quarterly review of error reports with investigation of unexpected results

# Assumption setting

While developing current best estimate assumptions for payout annuities, the assumption owner independently performs an experience study and applies actuarial judgment. The proposed assumption is reviewed and approved by the GAAP assumption steward and implemented in a standalone GAAP model.

What are the key risks, potential impacts, and controls that can help mitigate?



Risk



Impact



Controls

# Assumption setting

While developing current best estimate assumptions for payout annuities, the assumption owner independently performs an experience study and applies actuarial judgment. The proposed assumption is reviewed and approved by the GAAP assumption steward and implemented in a standalone GAAP model.

## Risk

The resulting GAAP projections are materially different than the existing strategic plan projections

## Impact

Investigation into the differences identifies an error in one of the models or in assumption development

## Controls

### Preventative

- Review GAAP assumptions with a working group of representatives from all actuarial functions
- Establish centralized assumption committee with oversight of all actuarial functions

### Detective

- Periodic reconciliation of all payout annuity models

# Data completeness and accuracy

Your data team developed an inforce extract for your new traditional life GAAP model. The data source is a legacy 'mainframe' admin system. Policy transactions are often processed manually, and there is little or no documentation.

What are the key risks, potential impacts, and controls that can help mitigate?



# Data completeness and accuracy

Your data team developed an inforce extract for your new traditional life GAAP model. The data source is a legacy 'mainframe' admin system. Policy transactions are often processed manually, and there is little or no documentation.

## Risk

Key data elements may be incomplete or inaccurate due to human error

## Impact

Financial statement error resulting from inaccurate model results

## Controls

### Preventative

- Validation of data completeness and accuracy
- Operational controls on data entry

### Detective

- Quarterly review of control reports with validation of policy counts and amounts

# Data dependency

You engage your asset management organization to supply you with market bond yields to determine the discount rate for future policy benefits. You set up your model to handle the format and structure of the input file they provided for your test cycle.

What are the key risks, potential impacts, and controls that can help mitigate?



# Data dependency

You engage your asset management organization to supply you with market bond yields to determine the discount rate for future policy benefits. You set up your model to handle the format and structure of the input file they provided for your test cycle.

## Risk

The supplier changes the format or structure of the yield inputs without giving you advance notice. The yields are applied inconsistently within company.

## Impact

Input change may require an emergency model change which introduces new risks

## Controls

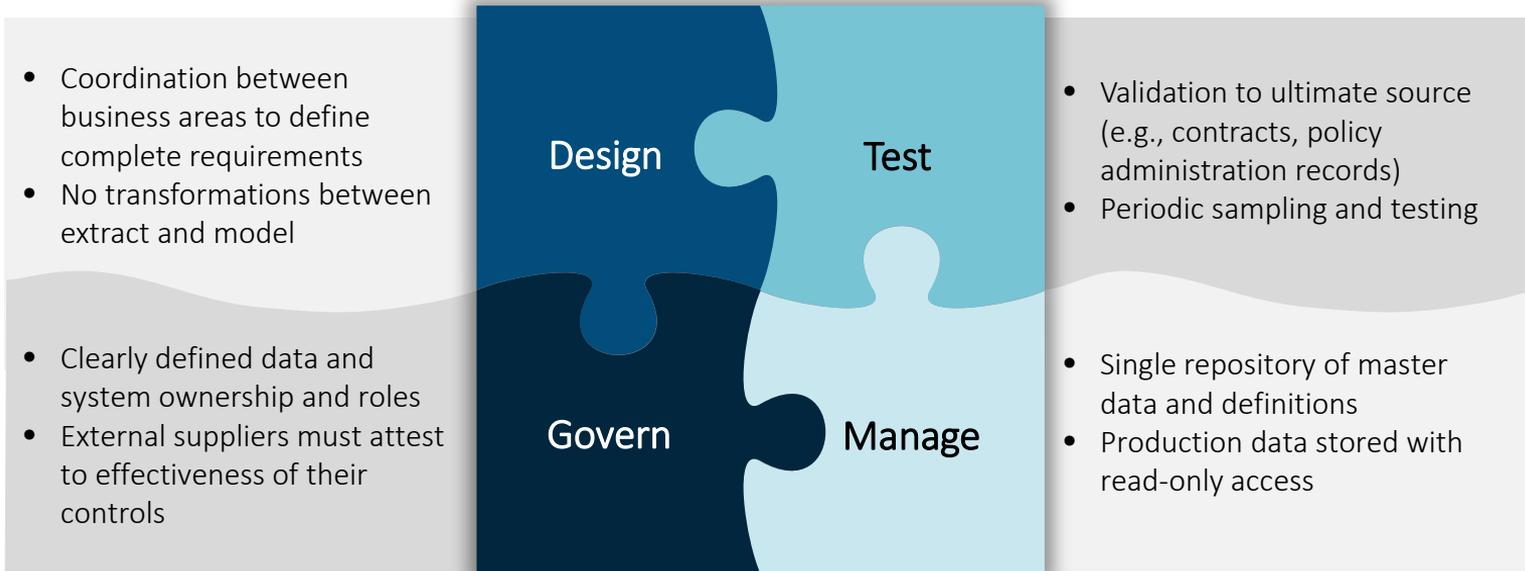
### Preventative

- Oblige supplier to establish change controls that include review of downstream impacts

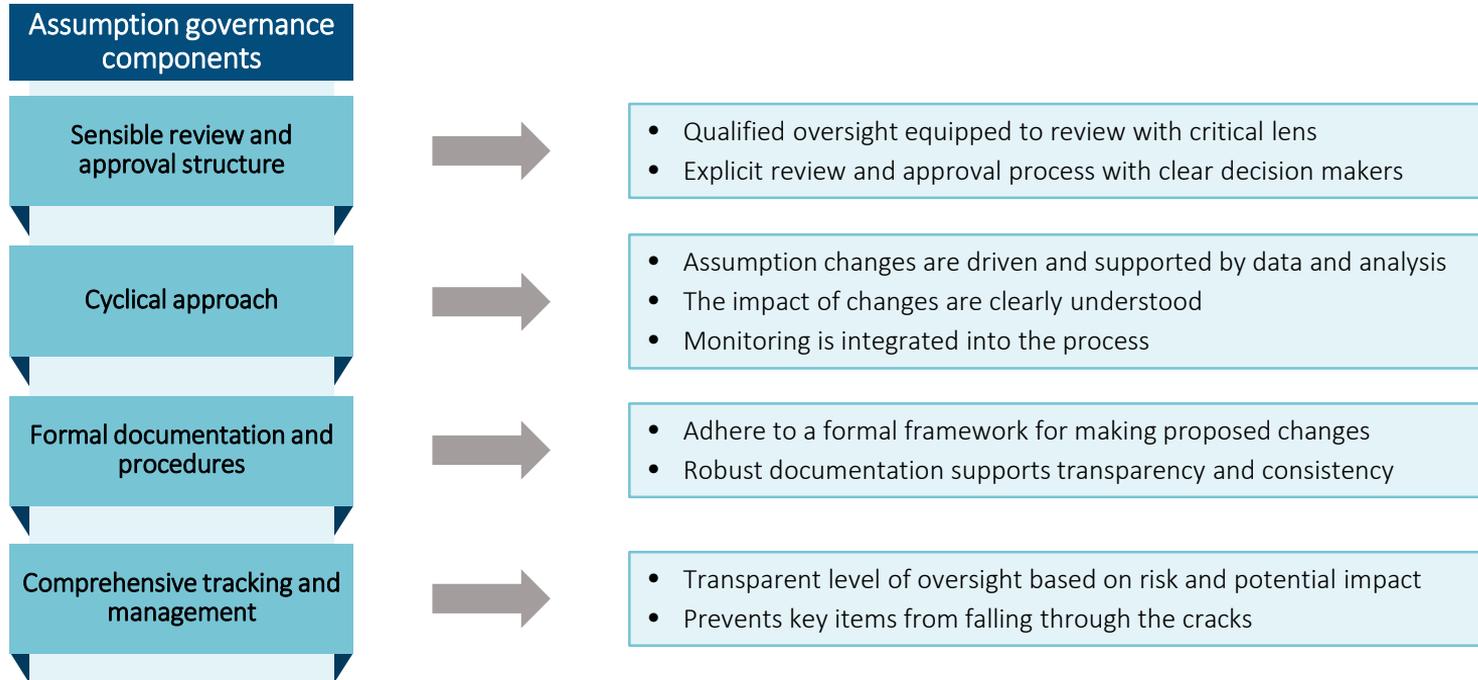
### Detective

- Analytic review of implied discount rate

# Data governance best practices



# Assumption governance best practices



# Modeling and validation



# LDTI model updates

DAC	Traditional Liabilities	Market risk benefits
<ul style="list-style-type: none"> <li>• Change amortization method to constant-level basis over the expected term of the liability</li> <li>• Reflect assumption revisions prospectively with measurement starting at beginning of period balance</li> <li>• Remove future capitalizations from DAC</li> </ul>	<ul style="list-style-type: none"> <li>• Change reserve calculation from “locked-in” to retrospective unlocking and true-up for actual cash flows</li> <li>• Perform multiple valuation calculations to capture changes due to discount rate, experience, and assumptions</li> <li>• Analyze and update assumptions regularly</li> <li>• Cap net premium ratio at 100% and capture excess net premium over gross premium</li> </ul>	<ul style="list-style-type: none"> <li>• Expand fair value scope to include insurance based market guarantees and certain other benefits</li> <li>• Aggregate projected cash flows for multiple MRB to perform a single valuation calculation</li> <li>• Apply option-based or non-option fair value valuation approach to MRB</li> <li>• Perform multiple valuations to capture changes due to instrument-specific credit risk</li> </ul>



# Model design

You are converting a legacy term block of business using a factor-based approach in mainframe to another actuarial valuation system due to the new LDTI requirements - *DAC amortization method is changed and GAAP reserve assumptions are unlocked*. Your plan is to develop a model that can produce the DAC and GAAP reserves with a short turnaround time.

What are the key risks, potential impacts, and controls that can help mitigate?



Risk



Impact



Controls

# Model design

You are converting a legacy term block of business using a factor-based approach in mainframe to another actuarial valuation system due to the new LDTI requirements - *DAC amortization method is changed and GAAP reserve assumptions are unlocked*. Your plan is to develop a model that can produce the DAC and GAAP reserves with a short turnaround time.

## Risk

Inefficient model structure may produce inaccurate results and incur additional manual process and run time

## Impact

Unable to streamline multiple valuation calculations to capture assumption changes and produce disclosures

## Controls

### Preventative

- Establish streamlined, automated, and controlled end-to-end modeling to reporting process, and obtain approvals from stakeholders

### Detective

- Periodically review modeling standards
- Enhance cross-organizational committee to govern model change standards



# Model simplifications

You converted to a new modeling software as part of LDTI implementations. Certain immaterial product features are modeled using a simplified approach. You have documented the simplifications and quantified financial impacts as of implementation.

What are the key risks, potential impacts, and controls that can help mitigate?



Risk



Impact



Controls

# Model simplifications

You converted to a new modeling software as part of LDTI implementations. Certain immaterial product features are modeled using a simplified approach. You have documented the simplifications and quantified financial impacts as of implementation.

## Risk

Simplifications could have unintended consequences to other parts of the models

## Impact

Financial impacts could become material

## Controls

### Preventative

- Framework for monitoring and assessing simplifications

### Detective

- Sensitivity testing / quantifying financial impacts regularly

# Model validation scope

Your model development team completed the new traditional life GAAP model. They also performed the unit testing, stress testing, and a few single policy testing on the new model. They conclude the results are reasonable and promote to production. The Valuation team relies on the development team's testing.

What are the key risks, potential impacts, and controls that can help mitigate?



# Model validation scope

Your model development team completed the new traditional life GAAP model. They also performed the unit testing, stress testing, and a few single policy testing on the new model. They conclude the results are reasonable and promote to production. The Valuation team relies on the development team's testing.

## Risk

Key modeling errors may not be detected due to lack of separations of duties

## Impact

The modeled results may lead to inaccurate financials

## Controls

### Preventative

- Model reviewers should be independent of developers

### Detective

- Periodically review the model governance process



# Model validation execution

You are validating the newly developed UL GAAP model output. You created a spreadsheet tool to automatically source the underlying data and assumptions from the model, and then independently calculate the DAC and Reserves per LDTI guidance. The results between the spreadsheet and the model reconcile.

What are the key risks, potential impacts, and controls that can help mitigate?



# Model validation execution

You are validating the newly developed UL GAAP model output. You created a spreadsheet tool to automatically source the underlying data and assumptions from the model, and then independently calculate the DAC and Reserves per LDTI guidance. The results between the spreadsheet and the model reconcile.

## Risk

Input data and assumptions in the model elements or test tool may be inaccurate

## Impact

The modeled results may lead to inaccurate financials

## Controls

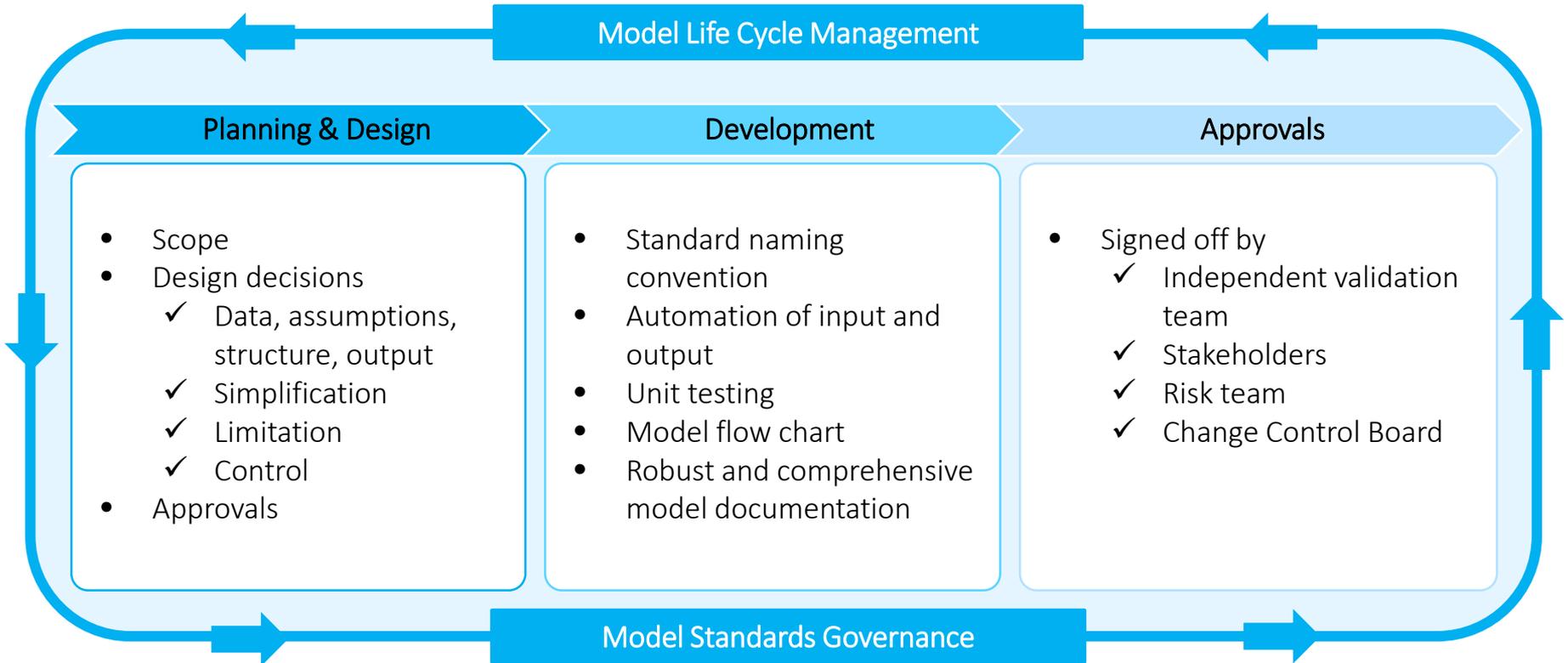
### Preventative

- Establish comprehensive test plans or independently create test tools directly from the true source

### Detective

- Periodically review model validation standards

# Modeling best practices



# Model validation best practices

## Scope



- Standards & governance
- Test plan
- Roles and responsibilities
- Process
- Approvals

## Execution



- Regression testing
- Static validation
- Data / assumption validation
- Policy / cohort testing
- Stress / sensitivity testing
- Dynamic validation
- Leakproof testing
- Assess fit for purpose

## Deliverables



- Documentation of evidence
- Simplification
- Limitation
- Analytics
- Waterfall attribution

# Output and reporting



# LDTI output and reporting updates

DAC	Traditional Liabilities	Market risk benefits
<ul style="list-style-type: none"> <li>• Update model output, reporting processes and systems for DAC, unearned revenue and deferred sales inducement rollforwards</li> <li>• Remove shadow DAC AOCI related adjustments from ledger / sub ledger feeds (captured in catch-up adjustment)</li> </ul>	<ul style="list-style-type: none"> <li>• Update model output, reporting processes and systems for reserve rollforwards</li> <li>• Update model output data processes to capture changes in the liability calculation due to 1) changes in the discount rate in OCI, 2) changes in experience in remeasurement gain / loss and 3) changes in reserve in benefit expense</li> </ul>	<ul style="list-style-type: none"> <li>• Change processes and systems to show MRB liability and changes separately on B/S and I/S</li> <li>• Revise subledger / ledger feeds to report instrument-specific credit risk in Other Comprehensive Income</li> <li>• Produce model output data, reporting process and systems for rollforwards</li> </ul>

# Eliminating spreadsheets

You currently use Excel as a DAC calculation engine; this file feeds the ledger. With the LDTI DAC calculation updates, you plan to eliminate spreadsheets and instead calculate DAC directly in your modeling software.

What are the key risks, potential impacts, and controls that can help mitigate?



# Eliminating spreadsheets

You currently use Excel as a DAC calculation engine; this file feeds the ledger. With the LDTI DAC calculation updates, you plan to eliminate spreadsheets and instead calculate DAC directly in your modeling software.

## Risk

Some non-DAC feeds in spreadsheet could be dropped unintentionally. New ledger feeds may be misinterpreted by accounting team

## Impact

Misalignment between modelled and booked results

## Controls

### Preventative

- Develop end-to-end process flows
- Maintain model inventory that defines purpose, inputs, and outputs for each model
- Proactively work with accounting team to establish new and remove obsolete ledger feeds

### Detective

- Validate ledger values against model output

# Disclosure automation

To comply with the new disclosure requirements, you use an automated process to perform the necessary model runs and calculate rollforwards. Runs require current and prior period inforce, current and prior period assumptions, and results split by new and existing business. You use functionality developed by your modeling software vendor, but you have customized the output reports for rollforwards.

What are the key risks, potential impacts, and controls that can help mitigate?



# Disclosure automation

To comply with the new disclosure requirements, you use an automated process to perform the necessary model runs and calculate rollforwards. Runs require current and prior period inforce, current and prior period assumptions, and results split by new and existing business. You use functionality developed by your modeling software vendor, but you have customized the output reports for rollforwards.

## Risk

Automated process is not fully understood by users. Customized rollforward report contains issues or do not comply with disclosure requirements

## Impact

Mistakes flow through financials undetected. Runs need to be re-processed from inadequate rollforwards

## Controls

### Preventative

- Test and document new vendor functionality before use in production model
- Obtain internal and external auditor buy-in for customized rollforwards

### Detective

- Static and dynamic validations

# Analytics and reviewing results

You are developing new GAAP analytics packages to be reviewed by senior management on a quarterly basis. You take advantage of the LDTI disclosure rollforward requirements to strategically develop new consolidation groups and key performance indicators (“KPIs”).

What are the key risks, potential impacts, and controls that can help mitigate?



# Analytics and reviewing results

You are developing new GAAP analytics packages to be reviewed by senior management on a quarterly basis. You take advantage of the LDTI disclosure rollforward requirements to strategically develop new consolidation groups and key performance indicators (“KPIs”).

## Risk

Aggregation is not at the right level of granularity, concealing key results. KPIs do not align with LDTI earnings impacts

## Impact

Suboptimal business decisions are made (e.g., product development, management, and pricing). Data or modeling mistakes are missed during review

## Controls

### Preventative

- Forecast and/or mock-rollforward of LDTI results
- Test several potential aggregation definitions and KPIs
- Develop customized analytics packages for Valuation team review and management review

### Detective

- Sensitivity testing of aggregation levels and KPIs

# Comparative financials

You have completed model development and validation steps and are now ready to productionalize your new LDTI GAAP model. You are required to produce 8 quarters of comparative financial results from LDTI transition date to adoption date. This necessitates developing results under prior GAAP regulations and the new LDTI framework for each quarter.

What are the key risks, potential impacts, and controls that can help mitigate?



# Comparative financials

You have completed model development and validation steps and are now ready to productionalize your new LDTI GAAP model. You are required to produce 8 quarters of comparative financial results from LDTI transition date to adoption date. This necessitates developing results under prior GAAP regulations and the new LDTI framework for each quarter.

## Risk

Results may not be reviewed under same scrutiny as normal production processes. Movement of results may not align with prior GAAP results

## Impact

Mistakes from rolling forward model impact future period results

## Controls

### Preventative

- Apply same set of controls used for normal production process, including model change and assumption governance
- Proactively obtain auditor buy-in

### Detective

- Sensitivity testing

# Output and reporting best practices

## Automate and streamline



Reduce risk by automating processes and reducing hand-off steps and manual processes

## Ledger controls



Validate model results to ledger values and have tracking system for outside-of-model adjustments

## Analytics and KPIs



Develop standard analytics packages with appropriate review guidelines

## Segregation of duties



Clearly define owners throughout process for proper accountability

## Proactive Communication



Proactively communicate between upstream and downstream owners and with internal and external audit

## Documentation



End-to-end process documentation illustrating all process inputs, outputs, and accounting bases



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