Simulink® Check™ Release Notes

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Contents

R2017b

Version: 4.0

New Features

Compatibility Considerations

Simulink Verification and Validation Packaging: Moved compliance checking, model metrics, clone detection and refactoring, and model transformer to Simulink Check

As of R2017b, Simulink® Verification and Validation™ transitions to three new products, Simulink Requirements, Simulink Coverage, and Simulink Check.

- Requirements traceability and Requirements Management Interface (RMI) functionality have moved to the Simulink Requirements™ product.
- Model and generated code coverage functionality, and component verification functions such as `slvnvmakeharness`, have moved to the Simulink Coverage™ product.
- Compliance checking, model metrics, clone detection and refactoring, and model transformer functionality have moved to the Simulink Check™ product.

Metrics Dashboard: Collect and view metric data for quality assessment

The Metrics Dashboard collects and integrates quality metric data from multiple Model-Based Design tools to provide you with an assessment of your project quality status. In R2017b, by using the dashboard, you can collect and explore metric data for:

- Model size
- Modeling guidelines compliance
- Model componentization and clone detection

To explore the data in more detail, click an individual metric. For your selected metric, a table displays the value, aggregated value, and measures (if applicable) at the model component level. From the table, the dashboard provides traceability and hyperlinks to the data source so that you can get detailed results and recommended actions for troubleshooting issues.

Open the Metrics Dashboard from the model editor window by selecting **Analysis > Metrics Dashboard**. Or, at the command line, enter `metricsdashboard(system)`.

For more information, see "Collect and Explore Metric Data by Using the Metrics Dashboard".

MathWorks High-Integrity Guidelines and Checks: Verify compliance with safety standards by using high-integrity checks and guidelines

Categorization of the Model Advisor Checks for High-Integrity Systems

You can use the Model Advisor to check compliance with safety standards by using the high-integrity checks. To execute these checks, Open the Model Advisor (Simulink) and select the safety standard:

- **By Task > Modeling Standards for DO-178/DO-331 > High-Integrity Systems**
- **By Task > Modeling Standards for EN 50128 > High-Integrity Systems**
- **By Task > Modeling Standards for IEC 61508 > High-Integrity Systems**
- **By Task > Modeling Standards for IEC 62304 > High-Integrity Systems**
- **By Task > Modeling Standards for ISO 26262 > High-Integrity Systems**

The high-integrity checks are categorized into these subgroups:

- Simulink
- Stateflow
- MATLAB
- Configuration
- Requirements
- Code

High-Integrity Model Advisor Checks for DO-178C/DO-331 Standards

The following table identifies the Model Advisor checks that have been introduced in R2017b to check compliance with safety standards DO-178C/DO-331.

These checks are available at **By Task > Modeling Standards for DO-178/DO-331 > High-Integrity Systems**. The high-integrity subgroup in which the check resides is defined in the table.

High-Integrity Systems Subgroup	Check Name
Simulink	Check for root Inports with missing properties
Simulink	Check for root Inports with missing range definitions

High-Integrity Systems Subgroup	Check Name
Stateflow	Check Stateflow charts for transition paths that cross parallel state boundaries
Stateflow	Check Stateflow charts for strong data typing
Stateflow	Check usage of shift operations for Stateflow data
Stateflow	Check assignment operations in Stateflow Charts
Stateflow	Check Stateflow charts for unary operators
Stateflow	Check usage of Stateflow constructs
Configuration	Check safety-related solver settings for simulation time
Configuration	Check safety-related solver settings for solver options
Configuration	Check safety-related solver settings for tasking and sample-time
Configuration	Check safety-related diagnostic settings for Merge blocks
Configuration	Check safety-related diagnostic settings for Stateflow
Configuration	Check safety-related optimization settings for Loop unrolling threshold
Code	Check for blocks not recommended for MISRA C:2012
Code	Check configuration parameters for MISRA C:2012

The following table identifies modifications to existing Model Advisor checks for DO-178C/DO-331 safety standards.

Model Advisor Check	Description of Change
Check for model elements that do not link to requirements	Check title has been updated. In previous releases, the title of this check was **Check for blocks that do not link to requirements**. The check ID did not change.

Model Advisor Check	Description of Change
Check model for block upgrade issues	No longer available as a **Modeling Standards for DO-178C/DO-331** check. For more information, see "DO-178C/DO-331 Modeling Checks: Removed Model Advisor check "Check model for block upgrade issues"" on page 1-20.

High-Integrity Model Advisor Checks for EN 50128, IEC 61508, IEC 62304, and ISO 26262 Standards

The following table identifies the Model Advisor checks that have been introduced in R2017b to check compliance with safety standards EN 50128, IEC 61508, IEC 62304, and ISO 26262.

These checks are available at:

• **By Task > Modeling Standards for EN 50128 > High-Integrity Systems**
• **By Task > Modeling Standards for IEC 61508 > High-Integrity Systems**
• **By Task > Modeling Standards for IEC 62304 > High-Integrity Systems**
• **By Task > Modeling Standards for ISO 26262 > High-Integrity Systems**

The high-integrity subgroup in which the check resides is defined in the table.

High-Integrity Systems Subgroup	Check Name
Simulink	Check usage of lookup table blocks
Simulink	Check for blocks not recommended for C/C++ production code deployment
Simulink	Check for variant blocks with 'Generate preprocessor conditionals' active
Simulink	Check usage of Signal Routing blocks
Stateflow	Check Stateflow charts for transition paths that cross parallel state boundaries
Stateflow	Check Stateflow charts for ordering of states and transitions
Stateflow	Check Stateflow debugging options

High-Integrity Systems Subgroup	Check Name
Stateflow	Check Stateflow charts for uniquely defined data objects
Stateflow	Check Stateflow charts for strong data typing
Stateflow	Check usage of shift operations for Stateflow data
Stateflow	Check assignment operations in Stateflow Charts
Stateflow	Check Stateflow charts for unary operators
Stateflow	Check usage of Stateflow constructs
Configuration	Check safety-related optimization settings
Configuration	Check safety-related model referencing settings
Configuration	Check safety-related code generation settings
Configuration	Check safety-related diagnostic settings for solvers
Configuration	Check safety-related solver settings for simulation time
Configuration	Check safety-related solver settings for solver options
Configuration	Check safety-related solver settings for tasking and sample-time
Configuration	Check safety-related diagnostic settings for sample time
Configuration	Check safety-related diagnostic settings for signal data
Configuration	Check safety-related diagnostic settings for parameters
Configuration	Check safety-related diagnostic settings for data used for debugging
Configuration	Check safety-related diagnostic settings for data store memory
Configuration	Check safety-related diagnostic settings for type conversions
Configuration	Check safety-related diagnostic settings for signal connectivity
Configuration	Check safety-related diagnostic settings for bus connectivity

High-Integrity Systems Subgroup	Check Name
Configuration	Check safety-related diagnostic settings that apply to function-call connectivity
Configuration	Check safety-related diagnostic settings for compatibility
Configuration	Check safety-related diagnostic settings for model initialization
Configuration	Check safety-related diagnostic settings for model referencing
Configuration	Check safety-related diagnostic settings for saving
Configuration	Check safety-related diagnostic settings for Merge blocks
Configuration	Check safety-related diagnostic settings for Stateflow
Configuration	Check safety-related optimization settings for Loop unrolling threshold
Requirements	Check for model elements that do not link to requirements
Code	Check configuration parameters for MISRA C:2012
Code	Check for blocks not recommended for MISRA C:2012

High-Integrity Modeling Guidelines

High-integrity system modeling guideline hisl_0070: Placement of requirement links in a model was introduced in R2017b.

These high-integrity system modeling guidelines were removed in R2017b:

- hisf_0010: Usage of transition paths (looping out of parent of source and destination objects)
- hisf_0012: Chart comments

The high-integrity system modeling guidelines in this table were updated to include new Model Advisor checks for DO-178C/DO-331, EN 50128, IEC 61508, IEC 62304, and ISO 26262 safety standards. Where applicable, the table also identifies additional modifications.

For a complete list of high-integrity system modeling guidelines, including their applicable Model Advisor checks, see "Model Advisor Checks for High-Integrity Modeling Guidelines" (Simulink).

High-Integrity Modeling Guideline	Description of Change
hisl_0002: Usage of Math Function blocks (rem and reciprocal)	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check usage of Math Operations blocks
hisl_0004: Usage of Math Function blocks (natural logarithm and base 10 logarithm)	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check usage of Math Operations blocks
hisl_0005: Usage of Product blocks	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for signal data
hisl_0013: Usage of data store blocks	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for data store memory
hisl_0018: Usage of Logical Operator block	Removed Model Advisor check Check safety-related optimization settings as it is covered via the prerequisite guideline.
hisl_0020: Blocks not recommended for MISRA C:2012 compliance	New Model Advisor checks: • DO-178C/DO-331: Check for blocks not recommended for MISRA C:2012 • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check for blocks not recommended for MISRA C:2012 • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check for blocks not recommended for C/C++ production code deployment Added: • Added From Workspace and S-Function Builder blocks to the list of blocks not recommended for MISRA compliance • Identified the deprecated Lookup Table blocks (Lookup and Lookup2D).

High-Integrity Modeling Guideline	Description of Change
hisl_0022: Data type selection for index signals	Removed n-D Lookup Table (internal type index selection) from the list of blocks that use a signal index.
hisl_0023: Verification of model and subsystem variants	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check for variant blocks with 'Generate preprocessor conditionals' active
hisl_0024: Inport interface definition	New Model Advisor check for DO-178C/DO-331: Check for root Inports with missing properties Updated guideline description to include Simulink signal object that explicitly resolves to the connected signal line.
hisl_0025: Design min/max specification of input interfaces	New Model Advisor check for DO-178C/DO-331: Check for root Inports with missing range definitions
hisl_0026: Design min/max specification of output interfaces	New Model Advisor check for DO-178C/DO-331: Check for root Outports with missing range definitions
hisl_0033: Usage of Lookup Table blocks	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check usage of lookup table blocks
hisl_0034: Usage of Signal Routing blocks	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check usage of Signal Routing blocks
hisl_0036: Configuration Parameters > Diagnostics > Saving	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for saving
hisl_0037: Configuration Parameters > Model Referencing	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related model referencing settings
hisl_0038: Configuration Parameters > Code Generation > Comments	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related code generation settings

High-Integrity Modeling Guideline	Description of Change
hisl_0039: Configuration Parameters > Code Generation > Interface	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related code generation settings
hisl_0040: Configuration Parameters > Solver > Simulation time	New Model Advisor checks: • DO-178C/DO-331: Check safety-related solver settings for simulation time • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related solver settings for simulation time
hisl_0041: Configuration Parameters > Solver > Solver options	New Model Advisor checks: • DO-178C/DO-331: Check safety-related solver settings for solver options • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related solver settings for solver options
hisl_0042: Configuration Parameters > Solver > Tasking and sample time options	New Model Advisor checks: • DO-178C/DO-331: Check safety-related solver settings for tasking and sample-time • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related solver settings for tasking and sample-time
hisl_0043: Configuration Parameters > Diagnostics > Solver	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for solvers
hisl_0044: Configuration Parameters > Diagnostics > Sample Time	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for sample time
hisl_0045: Configuration Parameters > Optimization > Implement logic signals as Boolean data (vs. double)	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related optimization settings

High-Integrity Modeling Guideline	Description of Change
hisl_0046: Configuration Parameters > Optimization > Block reduction	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related optimization settings
hisl_0047: Configuration Parameters > Code Generation > Code Style	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related code generation settings
hisl_0048: Configuration Parameters > Optimization > Application lifespan (days)	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262:Check safety-related optimization settings
hisl_0049: Configuration Parameters > Code Generation > Symbols	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related code generation settings
hisl_0051: Configuration Parameters > Optimization > Signals and Parameters > Loop unrolling threshold	New Model Advisor checks: • DO-178C/DO-331: Check safety-related optimization settings for Loop unrolling threshold • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related optimization settings for Loop unrolling threshold
hisl_0052: Configuration Parameters > Optimization > Data initialization	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related optimization settings
hisl_0053: Configuration Parameters > Optimization > Remove code from floating-point to integer conversions that wraps out-of-range values	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related optimization settings
hisl_0054: Configuration Parameters > Optimization > Remove code that protects against division arithmetic exceptions	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related optimization settings

High-Integrity Modeling Guideline	Description of Change
hisl_0060: Configuration parameters that improve MISRA C:2012 compliance	New Model Advisor checks: • DO-178C/DO-331: Check configuration parameters for MISRA C:2012 • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check configuration parameters for MISRA C:2012
hisl_0061: Unique identifiers for clarity	New Model Advisor checks: • DO-178C/DO-331: Check usage of Stateflow constructs • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check Stateflow charts for uniquely defined data objects
hisl_0301: Configuration Parameters > Diagnostics > Compatibility	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for compatibility
hisl_0302: Configuration Parameters > Diagnostics > Data Validity > Parameters	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for parameters
hisl_0303: Configuration Parameters > Diagnostics > Merge block	New Model Advisor checks: • DO-178C/DO-331: Check safety-related diagnostic settings for Merge blocks • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for Merge blocks
hisl_0304: Configuration Parameters > Diagnostics > Model initialization	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for model initialization
hisl_0305: Configuration Parameters > Diagnostics > Debugging	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for data used for debugging

High-Integrity Modeling Guideline	Description of Change
hisl_0306: Configuration Parameters > Diagnostics > Connectivity > Signals	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for signal connectivity
hisl_0307: Configuration Parameters > Diagnostics > Connectivity > Buses	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for bus connectivity
hisl_0308: Configuration Parameters > Diagnostics > Connectivity > Function calls	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings that apply to function-call connectivity
hisl_0309: Configuration Parameters > Diagnostics > Type Conversion	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for type conversions Added **Type Conversion** parameters: • **Unnecessary type conversion** • **32-bit integer to single precision float conversion**
hisl_0310: Configuration Parameters > Diagnostics > Model Referencing	New Model Advisor check for IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for model referencing
hisl_0311: Configuration Parameters > Diagnostics > Stateflow	New Model Advisor checks: • DO-178C/DO-331: Check safety-related diagnostic settings for Stateflow • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check safety-related diagnostic settings for Stateflow The rational from hisf_0010: Usage of transition paths (looping out of parent of source and destination objects) was incorporated into this guideline.

High-Integrity Modeling Guideline	Description of Change
hisf_0002: User-specified state/ transition execution order	New Model Advisor checks: • DO-178C/DO-331: Check usage of Stateflow constructs • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check Stateflow charts for ordering of states and transitions • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check usage of Stateflow constructs
hisf_0009: Strong data typing (Simulink and Stateflow boundary)	New Model Advisor check for DO-178C/DO-331: Check usage of Stateflow constructs
hisf_0011: Stateflow debugging settings	New Model Advisor checks: • DO-178C/DO-331: Check usage of Stateflow constructs • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check Stateflow debugging options • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check usage of Stateflow constructs
hisf_0013: Usage of transition paths (crossing parallel state boundaries)	New Model Advisor checks: • DO-178C/DO-331: Check Stateflow charts for transition paths that cross parallel state boundaries • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check Stateflow charts for transition paths that cross parallel state boundaries
hisf_0015: Strong data typing (casting variables and parameters in expressions)	New Model Advisor checks: • DO-178C/DO-331: Check Stateflow charts for strong data typing • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check Stateflow charts for strong data typing

High-Integrity Modeling Guideline	Description of Change
hisf_0064: Shift operations for Stateflow data to improve code compliance	New Model Advisor checks: • DO-178C/DO-331: Check usage of shift operations for Stateflow data • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check usage of shift operations for Stateflow data Title update. No change to guideline content.
hisf_0065: Type cast operations in Stateflow to improve code compliance	New Model Advisor checks: • DO-178C/DO-331: Check assignment operations in Stateflow charts • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check assignment operations in Stateflow charts Title update. No change to guideline content.
hisf_0211: Protect against use of unary operators in Stateflow Charts to improve code compliance	New Model Advisor checks: • DO-178C/DO-331: Check Stateflow charts for unary operators • IEC 61508, IEC 62304, EN 50128, and ISO 26262: Check Stateflow charts for unary operators Title update. No change to guideline content.

Modeling Support for Secure Coding Standards: Check model for compliance with secure coding requirements in CERT C, CWE, ISO/IEC TS 17961 standards to improve security of generated code

You can use Model Advisor to check the model or subsystem for compliance with secure coding requirements in CERT C, CWE, and ISO/IEC TS 17961 standards. To execute these checks, "Select and Run Model Advisor Checks" (Simulink) and select **By Task** > **Modeling Guidelines for Secure Coding (CERT C, CWE, ISO/IEC TS 17961)**.

This table summarizes the Modeling Standards for Secure Coding checks.

Check	Description	Addresses Secure Coding Standards
Check configuration parameters for secure coding standards	Identifies configuration parameters that might impact code security.	
Check for blocks not recommended for C/C++ production code deployment	Identifies blocks not supported by code generation or not recommended for C/C++ production code deployment.	
Check for blocks not recommended for secure coding standards	Identifies blocks not supported by secure coding standards.	
Check usage of Assignment blocks	Identifies Assignment blocks that do not have block parameter **Action if any output element is not assigned** set to **Error** or **Warning**	• ISO/IEC TS 17961: 2013, uninitref • CERT C, EXP33-C • CWE, CWE-908
Check for switch case expressions without a default case	Identifies switch case expressions that do not have a default case.	• ISO/IEC TS 17961: 2013, swtchdflt • CERT C, MSC01-C • CWE, CWE-478
Check for bitwise operations on signed integers	Identifies Simulink blocks that contain bitwise operations on signed integers. The check does not flag MATLAB Function or Stateflow blocks that use signed operands for bitwise operators.	• CERT C, INT13-C • CWE, CWE-682
Check for equality and inequality operations on floating-point values	Identifies equality and inequality operations on floating-point values.	• CERT C, FLP00-C • CWE, CWE-697
Check integer word length	Identifies integer word lengths that do not comply with hardware implementation settings.	• CERT C, INT13-C • CWE, CWE-682

If you have Simulink Design Verifier™, the following design error detection checks are also available as part of the Modeling Standards for Secure Coding checks.

Check	Description	Addresses Secure Coding Standards
Detect Dead Logic	Identifies logic that stays inactive during simulation.	• CERT C, MSC07-C • CWE, CWE-561
Detect Integer Overflow	Identifies operations that exceed the data type range for integer or fixed-point operations.	• ISO/IEC TS 17961: 2013, intoflow • CERT C, INT30-C and INT32-C • CWE, CWE-190
Detect Division by Zero	Identifies operations in the model that cause division-by-zero errors.	• ISO/IEC TS 17961: 2013, diverr • CERT C, INT33-C and FLP03-C • CWE, CWE-369
Detect Out Of Bound Array Access	Detects operations that access outside the bounds of an array index	• ISO/IEC TS 17961: 2013, invptr • CERT C, ARR30-C • CWE, CWE-118
Detect Violation of Specified Minimum and Maximum Values	Checks the specified minimum and maximum values (the design ranges) on intermediate signals throughout the model and on the output ports. If the analysis detects that a signal exceeds the design range, the results identify where in the model the errors occurred.	• CERT C, API00-C • CWE, CWE-628

For information about the secure coding standards organizations, see "Secure Coding Standards" (Embedded Coder).

MISRA C: 2012 Modeling Checks: Improve compliance of generated code by using new MISRA C:2012 standards checks

To improve MISRA C:2012 compliance, these new checks are available through the Model Advisor. To execute these checks, "Select and Run Model Advisor Checks" (Simulink) and select **By Task** > **Modeling Guidelines for MISRA C:2012**.

Check	Description	Addresses MISRA C:2012
Check for missing error ports for AUTOSAR receiver interfaces	Identifies AUTOSAR receiver interface inports that do not have matching error ports.	Directive 4.7
Check for missing const qualifiers in model functions	Identifies input data pointers that do not have a const qualifier.	Rule 8.13
Check integer word length	Identifies integer word lengths that do not comply with hardware implementation settings.	Rule 10.1

Modifications to existing MISRA C:2012 compliance checks are outlined in this table.

Check	Description of Modification to the Check
Check for blocks not recommended for MISRA C:2012	Flags the inclusion of From Workspaceblocks

Check	Description of Modification to the Check
Check configuration parameters for MISRA C:2012	Flags the following parameter settings: • Configuration parameter **Wrap on overflow** is set to `none`. • Configuration parameter **Inf or NaN block output** is set to `none` • Configuration parameter **Inf or NaN block output** set to `none`. • Configuration parameter **Dynamic memory allocation in MATLAB Function blocks** is selected. • Parameter `ERTFilePackagingFormat` is set to `Modular`. • Parameter `PreserveStaticInFcnDecls` is set to `off`. hisl_0060: Configuration parameters that improve MISRA C:2012 compliance reflects these parameter settings.
Check for switch case expressions without a default case	Check can be executed on library models. Check can exclude blocks when you have Simulink Check.
Check for bitwise operations on signed integers	Check can exclude blocks when you have Simulink Check.
Check for equality and inequality operations on floating-point values	Check can exclude blocks when you have Simulink Check.

For information about MISRA C® versions and updates, see MISRA C Guidelines.

DO-178C/DO-331 Modeling Checks: Removed Model Advisor check "Check model for block upgrade issues"

In R2017b, Model Advisor check Check model for block upgrade issues (check ID `mathworks.design.Update`) is no longer available under **Analysis > Model Advisor > Modeling Standards for DO-178C/DO-331 > Simulink**.

You can still execute this check through the Upgrade Advisor (Simulink) at **Analysis > Model Advisor > Upgrade Advisor**.

Model Metrics: Evaluate model quality by using new metric algorithms

Evaluate model quality by using these new model metrics:

· Simulink diagnostic warning count: Measures the number of Simulink diagnostic warnings reported during model compilation for simulation.
· Parameter count: Measures the number of parameters in a model.
· Simulink clone count: Measures the number of clones in a model.
· Clone component content: Quantifies cloned content in the model.
· Library linked component content: Quantifies library-linked content in the model.
· Stateflow chart count: Measures the number of Stateflow charts at the model level.
· MatlabFunction count: Measures the number of MATLAB Function blocks at the model level.
· Explicit IO count: Measures the number of inports and outports to and from the model.
· File Count: Measures the number of model and library files.
· Model file count: Measures the number of model files.

For more information on these, and other available metric algorithms, see "Model Metrics".

Model Metric APIs: Create custom metrics with more detailed results and determine passed or failed compliance checks

In R2017b, the `slmetric.metric.Result` class contains the new property `Details`. `Details` is an array of objects of the new class `slmetric.metric.ResultDetail`. You

can write custom metrics that use this new class to store details about what the `Value` property of the `slmetric.metric.Result` object counts. You can also use this class to determine which MAAB and DO-178C/DO-331 metrics passed or failed.

For existing classes, there are these new properties:

Class	New Property
`slmetric.metric.ResultDetail`	`Details`
`slmetric.metric.Result`	`ID`
`slmetric.metric.ResultCollection`	`Outdated`
`slmetric.metric.Metric`	`SupportsResultDetails`

For more information see, `slmetric.metric.ResultDetail`.

Compatibility Considerations

In R2017b, you can not collect metric data for MISRA C:2012 and ISO 26262 metrics. Specifically, these metrics are not available:

- `mathworks.metrics.ModelAdvisorCheckCompliance.misra_c`
- `mathworks.metrics.ModelAdvisorCheckCompliance.ISO26262`
- `mathworks.metrics.ModelAdvisorCheckIssues.misra_c`
- `mathworks.metrics.ModelAdvisorCheckIssues.ISO26262`

For the DO-178C/DO-331 compliance metrics, the metric IDs `mathworks.metrics.ModelAdvisorCheckCompliance.do178` and `mathworks.metrics.ModelAdvisorCheckIssues.do178` are now named `mathworks.metrics.ModelAdvisorCheckCompliance.hisl_do178` and `mathworks.metrics.ModelAdvisorCheckIssues.hisl_do178`.

Model Advisor Configuration Editor: Select edit-time checks from folders

In the Model Advisor Configuration Editor, the tool now lists edit-time checks in folders instead of in a flat list. The folder structure is the same folder structure as for the Model Advisor. The Model Advisor Configuration Editor includes only folders that contain edit-time checks.

For more information, see "Organize Checks and Folders Using the Model Advisor Configuration Editor" .