



**WORLD EVENT
2010**

Making ModelCHECK Work For You

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WORLD EVENT
2010

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Event hashtag is #PTCUSER10

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United Space Alliance, LLC.

- Our Mission: Provide safe, high-quality, best-value space operations, services and technologies to our customers.
- Capabilities:
 - Engineering Design
 - Space Flight Mission Operations
 - Space Systems Ground Operations & Processing
 - Space Systems Integrated Logistics
 - Space Systems Flight Software
 - Space Systems Integration & Program Management
- Locations:
 - Texas: Johnson Space Center, Florida: Kennedy Space Center, Alabama: Marshall Space Flight Center

What to Expect

- Part I - ModelCHECK Overview.
- Part II - Customization, The Basics.
- Part III - More than just a validating tool.
- Part IV - Managing your configurations.

2010

Part I – Overview

- config_init.mc
- condition.mcc
- setconf.mcc
- start.mcs
- check.mch
- constant.mcn
- status.mcq



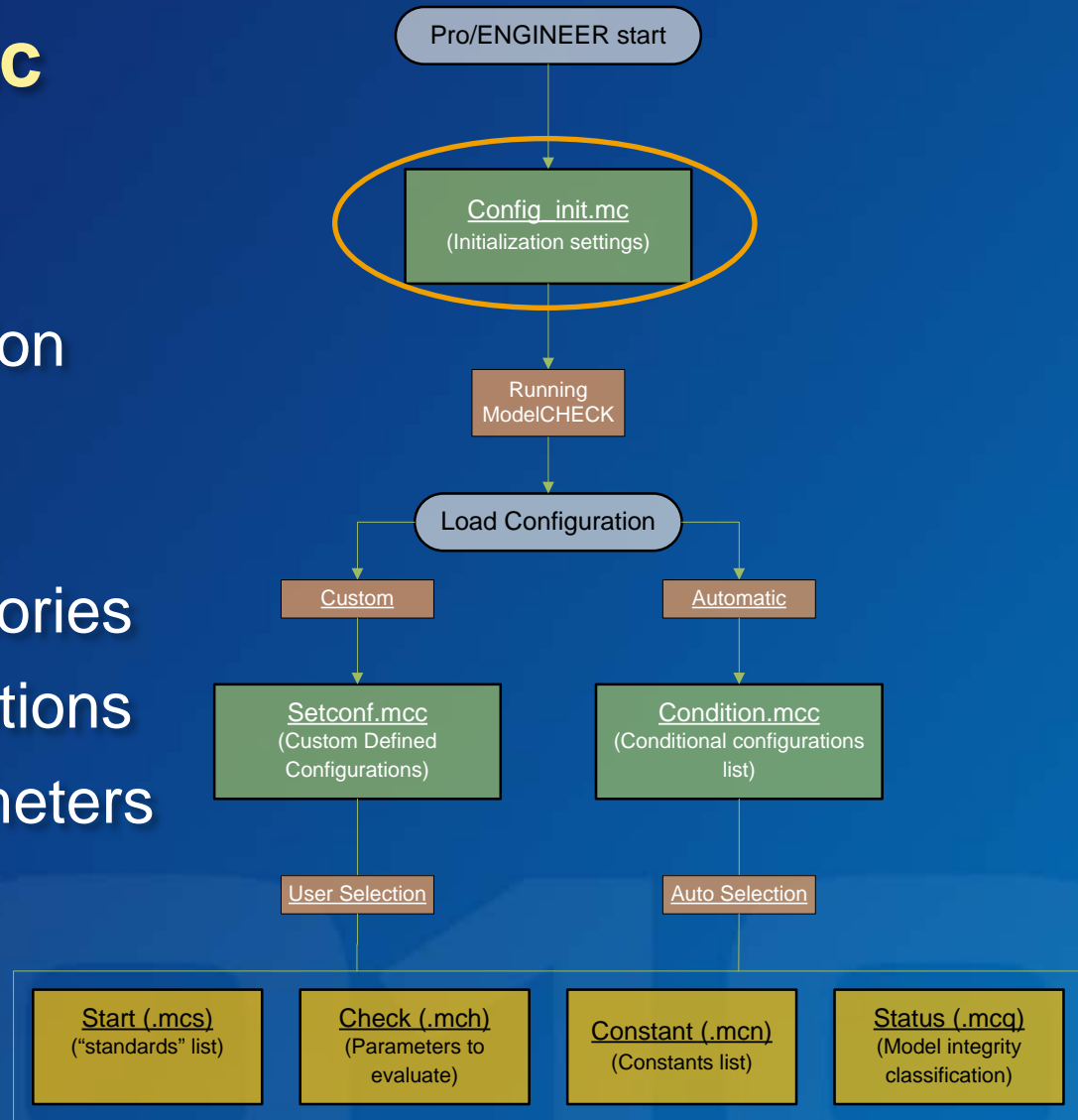
Part II – Customizing ModelCHECK

- Configuration Files Located in:
`<loadpoint>\modchk\text\<language>\config`
- Good idea to keep a backup of the default configuration

2010

config_init.mc

- Initial configuration settings:
 - Run modes
 - Report directories
 - Check exceptions
 - Added parameters



config_init.mc

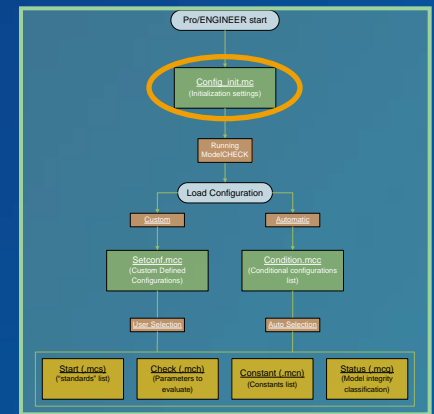
- Example settings:

```
! INITIALIZATION file for ModelCHECK.  
! This file is to initialize MC. It is read only once.
```

```
! "I" = Interactive  
! "B" = Batch  
! "R" = Regeneration  
! "S" = Save
```

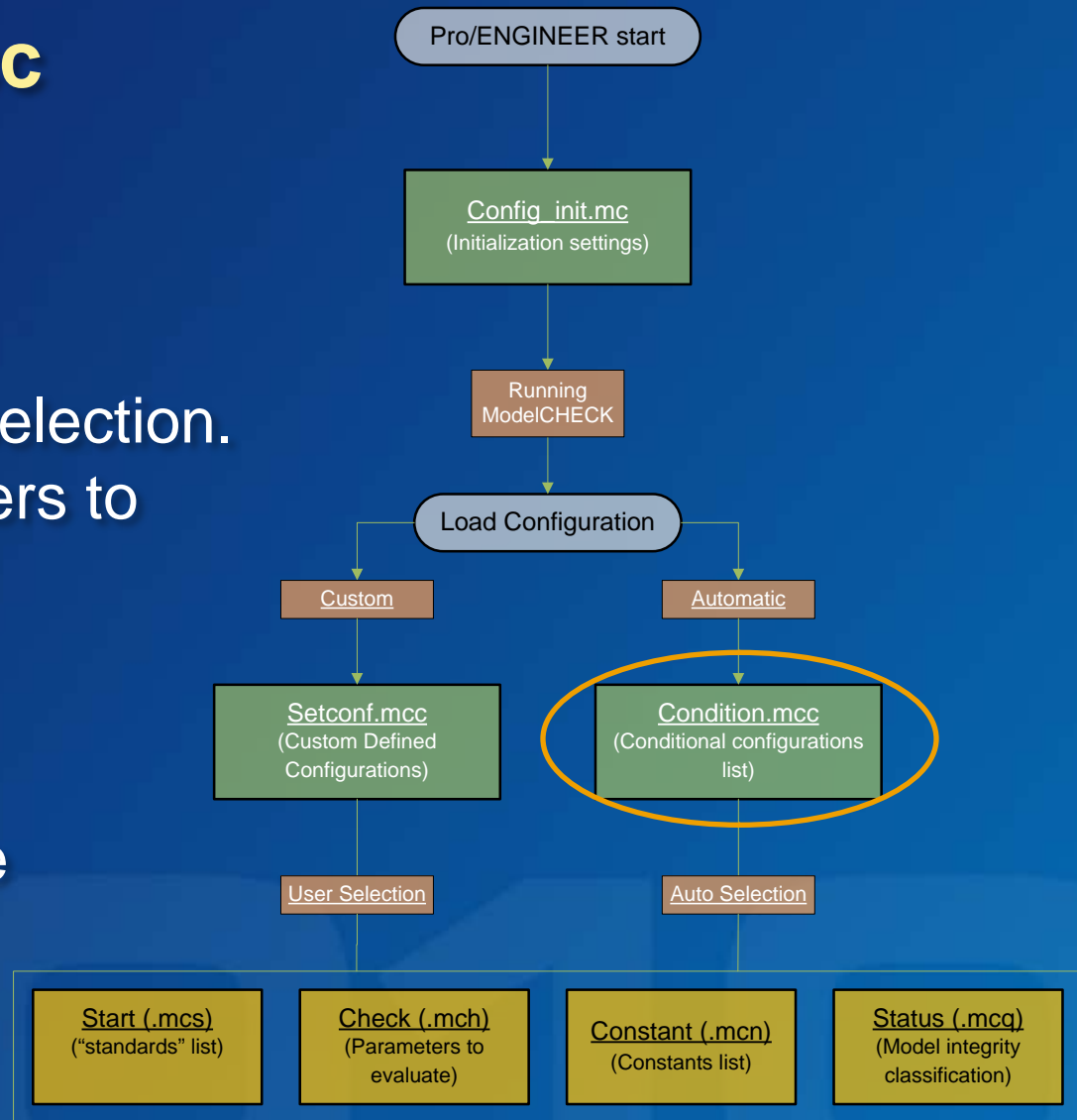
```
! -----  
#           Options "I"      "B"      "R"      "S"  
! -----
```

MODE_RUN	YN	Y	N	N	N
DRW_SHEET_ALL	YN	Y	Y	Y	N
ADD_DATE_PARM	YN	Y	N	Y	N
ADD_ERR_PARM	YN	Y	N	Y	N
ADD_CONFIG_PARAM	YN	Y	N	Y	N
ADD_MODE_PARM	YN	Y	N	Y	N
HTML_MAX_DAYS	7				
NUM_ITEMS_LONG_LIST	100				
SAVE_MC_PRE	YN	N			



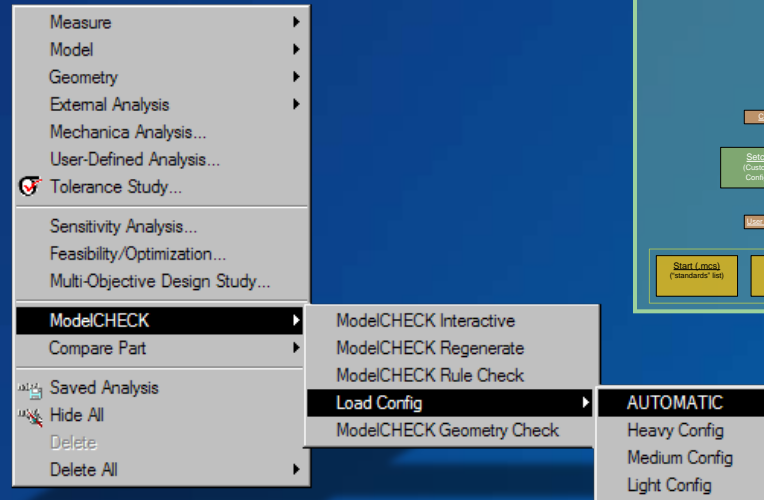
condition.mcc

- Conditional configuration selection. Uses parameters to determine:
 - Check file
 - Start file
 - Constant file
 - Status file



condition.mcc

- Example conditions:



! Conditional file for ModelCHECK.

SET CONFIG FILE

IF (NOCHECK) NOCHECK

IF (PTC_WM_LIFECYCLE_STATE EQ Released) NOCHECK

IF (PTC_WM_LOCATION EQ /Mechanical Hardware/*) config=(check/fastener_checks.mch)(start/fastener_start.mcs)(constant/inch.mcn)(status/sample_status.mcs)

IF (PTC_WM_ITERATION EQ 0) config=(check/prelim_checks.mch)(start/prelim_start.mcs)(constant/inch.mcn)(status/sample_status.mcs)

IF (MODEL_SIZE EQ LARGE) SHORT_EDGES = No

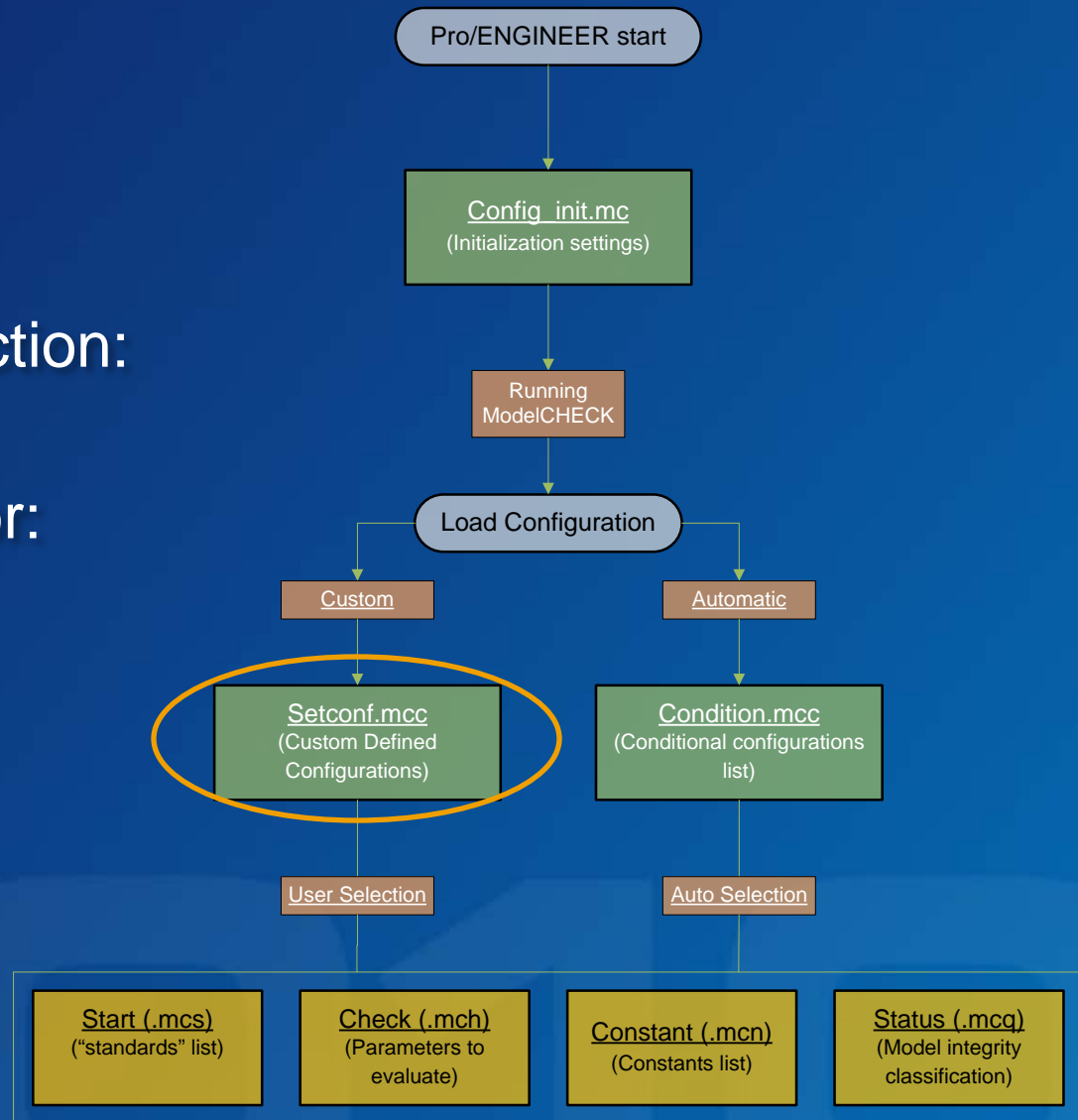
IF (CREATED_BY EQ Dyslexic Dan) MODEL_NAME = Error

ELSE config=(check/default_checks.mch)(start/default_start.mcs)(constant/inch.mcn)(status/sample_status.mcs)

- If model is Released, ModelCHECK skips it.
- Otherwise, ModelCHECK runs standard checks.

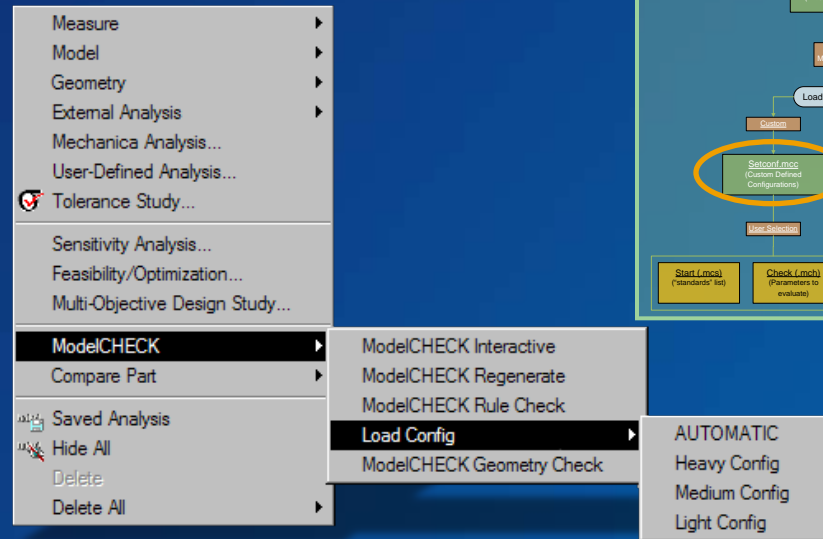
setconf.mcc

- Manual file selection:
- Uses preset configurations for:
 - Start file
 - Check file
 - Constant file
 - Status file



setconf.mcc

- Selection from “Load Config” menu.



ModelCHECK text file to name configurations to use for Heavy, Medium, Light

8-18-99 (amn)

Heavy=(check/default_checks.mch)(start/default_start.mcs)(constant/inch.mcn)(status/sample_status.mcq)

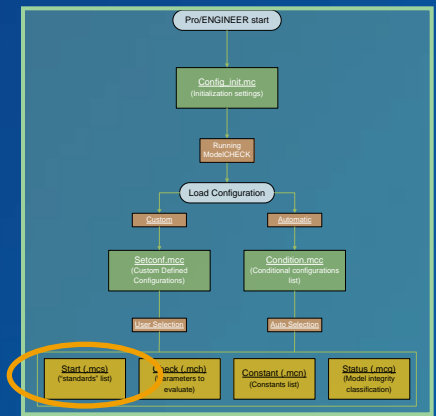
Medium=(check/medium_checks.mch)(start/default_start.mcs)(constant/inch.mcn) (status/sample_status.mcq)

Light=(check/light_checks.mch)(start/lightstart.mcs)(constant/inch.mcn) (status/sample_status.mcq)

The Basics – Setting up Standards

Start file - filename.mcs

- Standards*
 - Layers and contents
 - Datums
 - Parameters
 - Relations
 - Acceptable names list
 - Drawing setup options



*See APPENDIX A for more information.

start.mcs

- Example Options:
 - PRT_UNITS_MASS
 - PRT_DATUM_PLANE
 - PRT_PARAMETER
- Mode Specific:
 - PRT_LAYER
 - vs.
 - ASM_LAYER
 - vs.
 - DRW_LAYER

```
! Configuration file for ModelCHECK.

# START PART REPORT CONFIGURATION (PRT_, ASM_, DRW_)
#####

PRT_DATUM_PLANE DTM1 1

PRT_DATUM_CSYS CS0 4

PRT_DATUM_AXIS A_3 7

PRT_VIEW TOP

PRT_PARAMETER PTC_WM_REVISION

PRT_TOL_TYPE ANSI

PRT_MODEL_NAME EQ LIST_PART_NAMES
LIST_PART_NAMES #####-####-###

PRT_UNITS_LENGTH INCH

PRT_UNITS_MASS POUND

PRT_LAYER MISC_DATUM_PLANES BLANK DATUM_PLANES

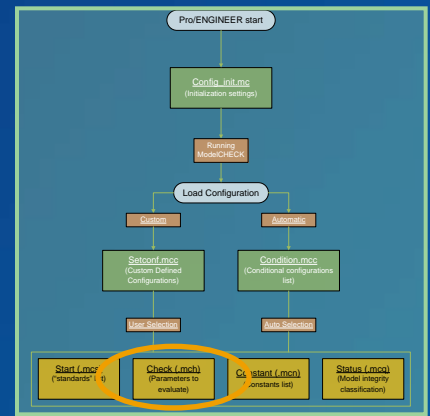
PRT_RELATION sample1=sample2

STD_DRW_DTL_FILE DEFAULT C:/.../companydrawing.dtl

MATERIAL_NAME AL6061
```

The Basics – Setting Checks

Check file - filename.mch



- Compares model data to standards (start.mcs)*
 - Layers (Proper name, contents, status)
 - Datums (Proper name, position, layer, references)
 - Parameters
 - Relations
 - Acceptable names list
 - Drawing setup options

*See APPENDIX B for more information.

check.mch

- Example Checks:
 - CYL_CUT_SLOTS
 - SUP_COMPONENTS
 - DIM_OVERWRITE
- Run Modes:
 - Interactive
 - Batch
 - Regenerate
 - Save

```
! Configuration file for ModelCHECK.
!
! E Check the item. If not succeed, report as an error.
! W Check the item. If not succeed, report as a warning.
! N Do not check the item.
! Y Check the item. If not succeed, report info only.
!
! "I" = Interactive
! "B" = Batch
! "R" = Regeneration
! "S" = Save
!
! -----
#           Options           "I"   "B"   "R"   "S"
! -----

# PART REPORT CONFIGURATION

CYL_CUT_SLOTS YNEW           W     N     N     N
EARLY_ROUND YNEW            W     W     N     N
EDGE_REFERENCES YNEW        W     E     E     E
FILE_SIZE YN                 Y     Y     N     N
STARTCHECK YNEW              W     E     N     W

# ASSEMBLY REPORT CONFIGURATION

SUP_COMPONENTS YNEW          E     E     W     W
PACK_COMPONENTS YNEW         E     E     E     E
CIRCULAR_REFS YNEW           W     W     N     N

# DRAWING REPORT CONFIGURATION

DIM_OVERWRITE YNEW           E     E     N     N
STD_DTL_SETUP YNEW           W     N     N     N
```

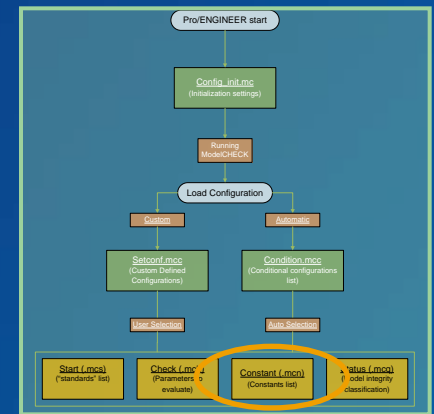

check.mch

- Run Modes:
 - Interactive – On-demand, with or without regeneration.
 - Batch – Run on external list of models.
 - Regenerate – Automatic upon regeneration.
 - Save – Automatic upon save.
- Output type
 - (Y) Run check, output as information only.
 - (N) Do not run check.
 - (E) Run check, output failure as error.
 - (W) Run check, output failure as warning.

The Basics – Setting Constants

Constant file - filename.mcn

- Sets constant values for variable checks.
 - Early rounds
 - Early Drafts
 - Short edges
 - Sharp angles
 - # of items on sketches
 - Accuracy



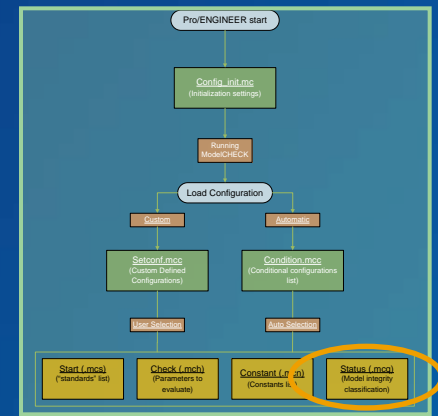
constant.mcn

- Example Constants:
 - *PERC_EARLY_ROUND*
 - Initial **XX** percent of model tree should not contain round features (**0.25 = 25%**)
 - *SHORT_EDGE* – Edges shorter than **XX** are flagged (**0.01 inches**).

```
# 26-DEC-01 $$1 J-03-15 VA Add MCSI Tol
# CONSTANT REPORT CONFIGURATION
SHORT_EDGE          0.01
PERC_EARLY_ROUND    0.25
PERC_EARLY_DRAFT    0.25
PERC_EARLY_CHAMF    0.25
PERC_EARLY_COSMETIC 0.7
SMALL_RADIUS        0.01
ACCURACY_LOW        0.0005
ACCURACY_UPP        0.0013
MIN_ABS_ACCURACY    0.001
MAX_ABS_ACCURACY    0.0030
SHARP_ANGLE         10.0
GLOBAL_INTF_DAYS    1
MIN_TOLERANCE       0.001
SHORT_EDGE_BATCH    0.05
MAX_DRAW_SHEETS     10
#
RC_PARAMETER_NAME   PTC_WM_LIFECYCLE_STATE
MAX_SKETCH_ITEMS    100
MCSI1_TOL           .03
MCSI2_TOL           .03
MCSI3_TOL           .03
MCSI4_TOL           .03
MCSI5_TOL           .03
```

The Basics – Setting Status

Status file - filename.mcq

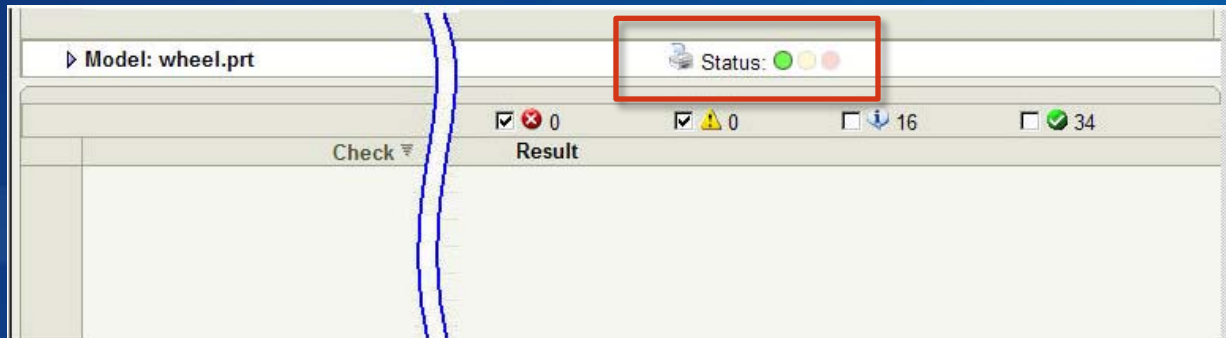


- Sets conditions for model “status” in ModelCHECK report.
 - Status can be used to quickly indicate model integrity.

status.mcq

- Sets status to Green if:
 - “Warnings” ≤ 0
and
 - “Errors” ≤ 0

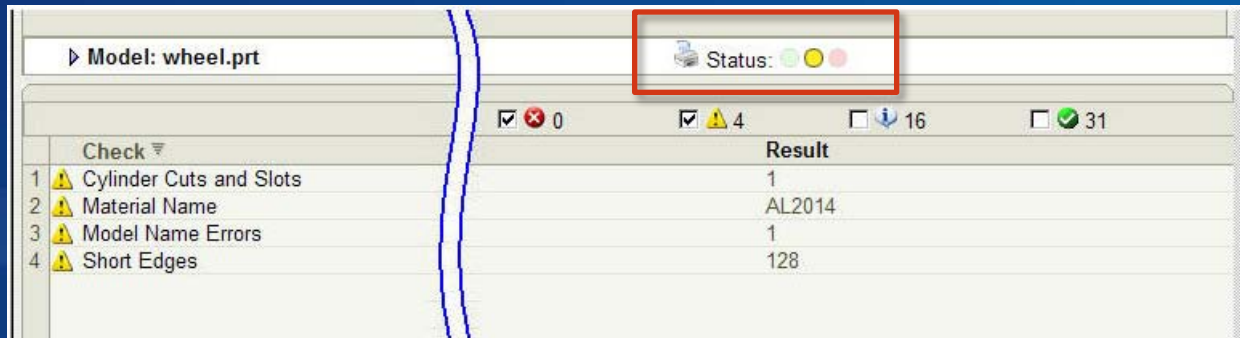
```
! STATUS file for ModelCHECK.  
! This file is to set model status within MC report.  
  
GREEN 0E,0W  
YELLOW 0E,25W
```



status.mcq

- Sets status to Yellow if:
 - “Warnings” ≤ 25
and
 - “Errors” ≤ 0

```
! STATUS file for ModelCHECK.  
! This file is to set model status within MC report.  
  
GREEN 0E,0W  
YELLOW 0E,25W
```



status.mcq

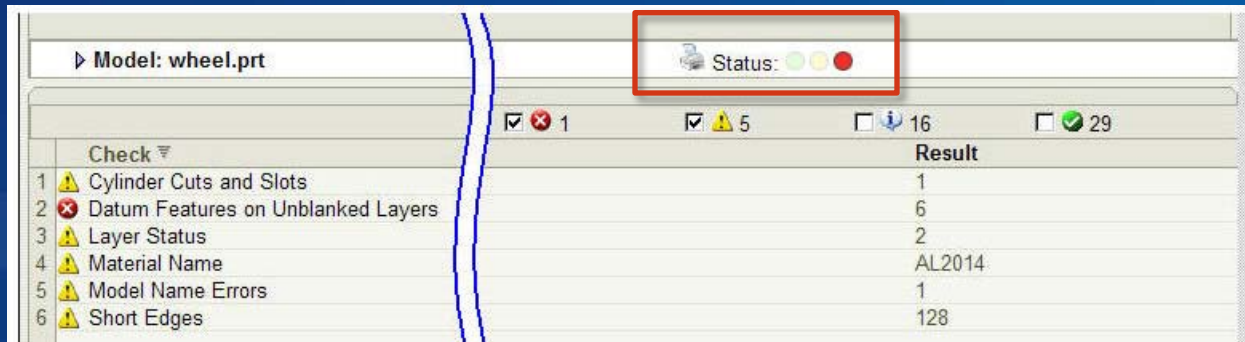
- Sets status to **Red** if:

- “Warnings” > 25

or

- “Errors” > 0 (**ELSE** condition)

```
! STATUS file for ModelCHECK.  
! This file is to set model status within MC report.  
  
GREEN 0E,0W  
YELLOW 0E,25W
```



Check	Result
1 ⚠ Cylinder Cuts and Slots	1
2 ❌ Datum Features on Unblanked Layers	6
3 ⚠ Layer Status	2
4 ⚠ Material Name	AL2014
5 ⚠ Model Name Errors	1
6 ⚠ Short Edges	128

Part III – More Than Just A Validating Tool

ModelUPDATE Options:

- Rename datums
- Update layer structure
- Add missing layers
- Delete extra layers
- Correct layer contents
- Set correct layer status
- Deactivate insert mode
- Add missing parameters
- Delete extra parameters
- Map parameters
- Correct spelling errors
- Clear unused drawing models
- Delete buried features
- Copy model layers to drawing
- Update material
- Update model accuracy
- Create model views
- Delete erased views
- Add missing relations

What Does This Mean?

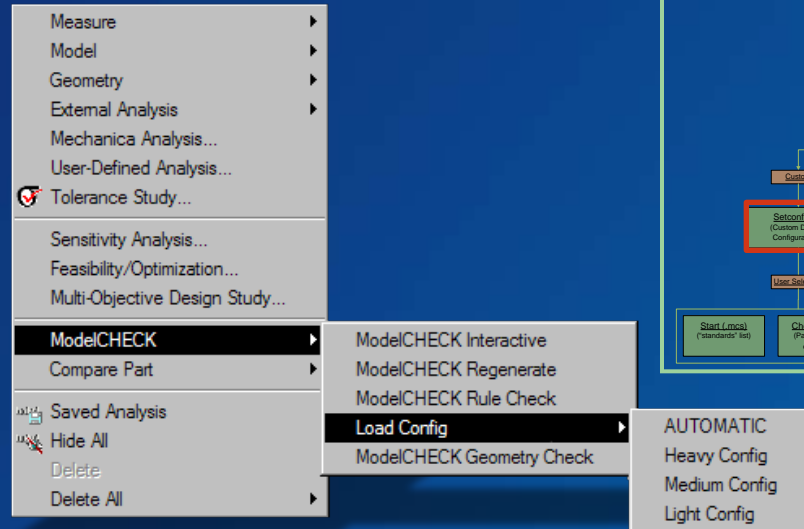
ModelCHECK can be configured to:

- Update old models to current standards.
- Repair models that follow incorrect standards.
- Allow real-time updates during validations.

Standards sets can be created as separate configurations when working for multiple customers, and to different requirements.

setconf.mcc

- Default configuration sets.



```
# ModelCHECK text file to name configurations to use for Heavy, Medium, Light
```

```
# 8-18-99 (amn)
```

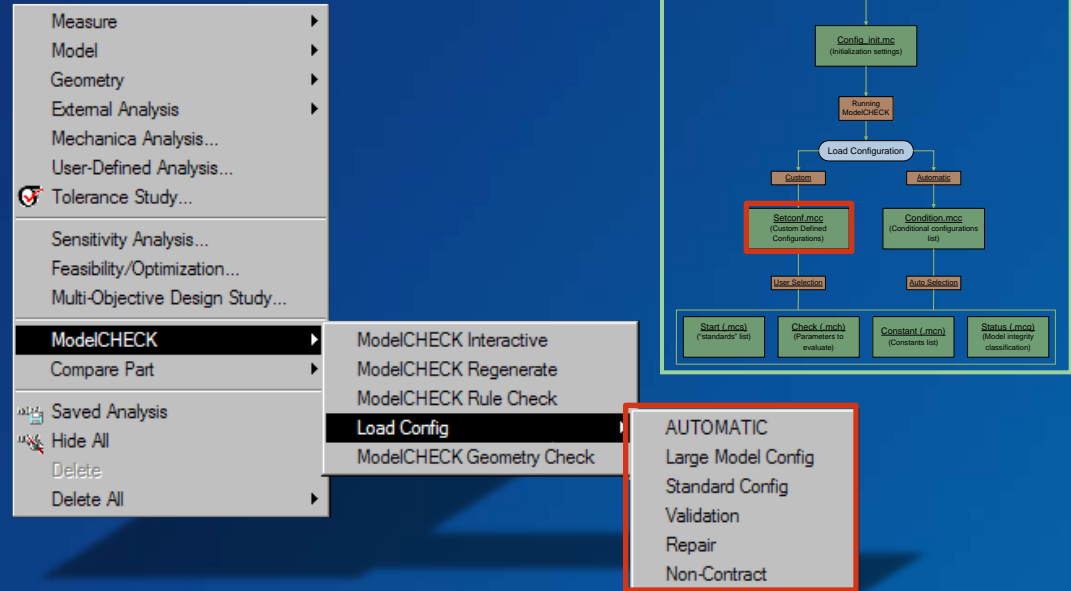
```
Heavy=(check/default_checks.mch)(start/default_start.mcs)(constant/inch.mcn)(status/sample_status.mcq)
```

```
Medium=(check/medium_checks.mch)(start/default_start.mcs)(constant/inch.mcn)(status/sample_status.mcq)
```

```
Light=(check/light_checks.mch)(start/lightstart.mcs)(constant/inch.mcn)(status/sample_status.mcq)
```

setconf.mcc

- Customized configuration sets.*

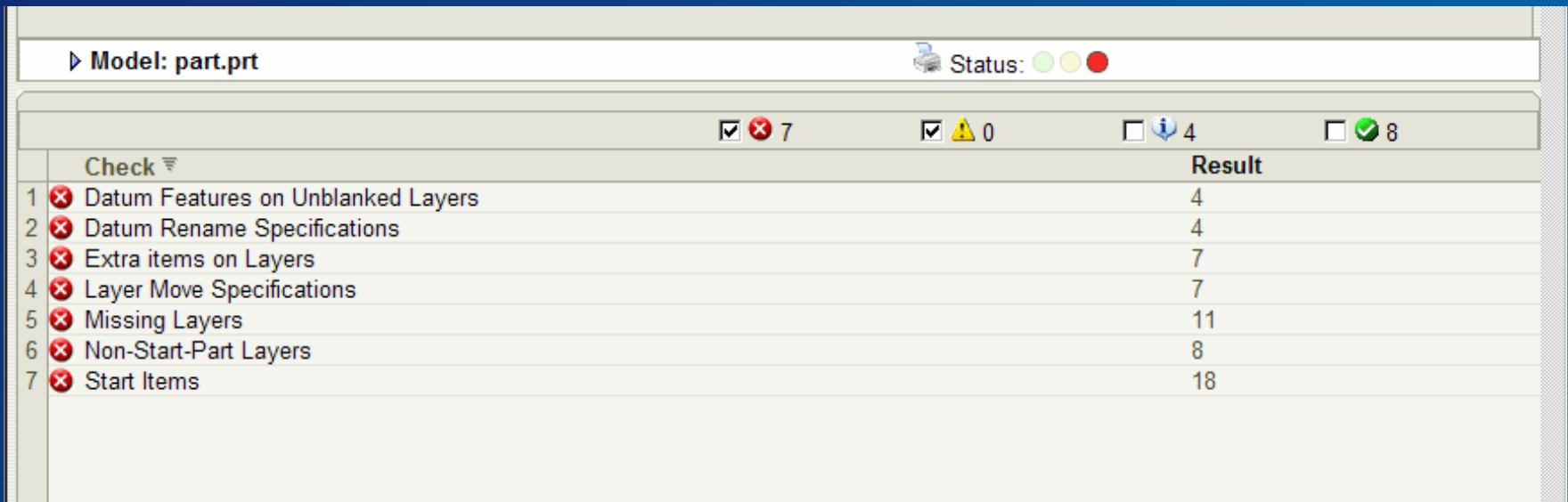


```
# ModelCHECK text file to name configurations to use for Large, Standard, Validation, Repair, Non-Contract
# 8-27-09
#
Large =(check/largemod_checks.mch) (start/default_start.mcs) (constant/inch.mcn) (status/sample_status.mcq)
#
Standard =(check/default_checks.mch) (start/default_start.mcs) (constant/inch.mcn) (status/sample_status.mcq)
#
Validation =(check/validation_checks.mch) (start/validation_start.mcs) (constant/inch.mcn) (status/sample_status.mcq)
#
Repair =(check/repair_checks.mch) (start/default_start.mcs) (constant/inch.mcn) (status/sample_status.mcq)
#
Non_Contract =(check/custom_checks.mch) (start/custom_start.mcs) (constant/inch.mcn) (status/sample_status.mcq)
```

*See APPENDIX C for more information.

Case Study – Updating A Model

In this example, a model was created using the wrong start.prt. A “Repair” configuration is set and ModelCHECK is run. The result is a list of errors related to start configuration.



Check	Result
1 Datum Features on Unblanked Layers	4
2 Datum Rename Specifications	4
3 Extra items on Layers	7
4 Layer Move Specifications	7
5 Missing Layers	11
6 Non-Start-Part Layers	8
7 Start Items	18

Model: part.prt Status:

7 0 4 8

Case Study – Updating A Model

ModelUPDATE allows real-time updates from within the report. Items are moved from old layers to new layers and old layers are deleted. Datums are renamed to company standard.

LAYER_MOVE
Number of layer move specifications: 7

01	_PRT_ALL_DTM_PLN	-->	MISC_DATUM_PLANES
01	_PRT_DEF_DTM_PLN	-->	DEFAULT_DATUM_PLANES
02	_PRT_ALL_AXES	-->	MISC_DATUM_AXIS
03	_PRT_ALL_CURVES	-->	MISC_DATUM_CURVES
04	_PRT_ALL_DTM_PNT	-->	MISC_DATUM_POINTS
05	_PRT_DEF_DTM_CSYS	-->	DEFAULT_CSYS
06	_PRT_ALL_SURFS	-->	MISC_SURFACES

DATUM_RENAME
Number of datum rename specifications: 4

FRONT	-->	DTM3
PRT_CSYS_DEF	-->	CS0
RIGHT	-->	DTM1
TOP	-->	DTM2

Case Study – Updating A Model

Extra (non-start) layers left over after LAYER_MOVE can be Removed manually. Non-standard items left on layers can be removed.

The image shows two side-by-side screenshots of CAD software panels. The left panel, titled 'LAYER_EXT_ITEMS', shows a list of 7 non-standard items on layers. The right panel, titled 'EXTRA_LAYERS', shows a list of 8 non-start-part layers in the active object. Both panels have buttons for 'Highlight', 'Remove', and 'Remove All' (left) or 'Delete Extra Layers' and 'Delete All' (right). The 'Remove All' and 'Delete All' buttons are highlighted with red boxes.

LAYER_EXT_ITEMS
Number of non-standard items on layers: 7

DATUM id 1	01__PRT_ALL_DTM_PLN
DATUM id 3	01__PRT_ALL_DTM_PLN
DATUM id 5	01__PRT_ALL_DTM_PLN
DATUM id 1	01__PRT_DEF_DTM_PLN
DATUM id 3	01__PRT_DEF_DTM_PLN
DATUM id 5	01__PRT_DEF_DTM_PLN
CSYS id 7	05__PRT_DEF_DTM_CSYS

Buttons: Highlight, Blue (dropdown), Remove, **Remove All**

EXTRA_LAYERS
Number of non-start-part layers in Active Object: 8

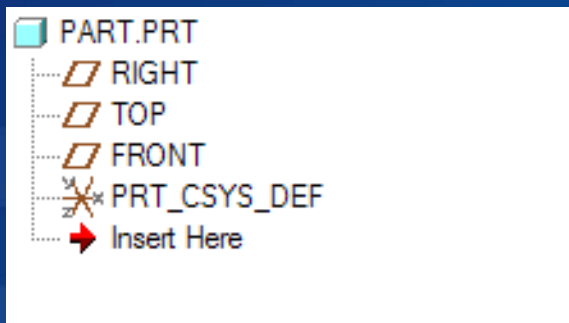
01__PRT_ALL_DTM_PLN
01__PRT_DEF_DTM_PLN
02__PRT_ALL_AXES
03__PRT_ALL_CURVES
04__PRT_ALL_DTM_PNT
05__PRT_ALL_DTM_CSYS
05__PRT_DEF_DTM_CSYS

Buttons: Delete Extra Layers, **Delete All**

Case Study – Updating A Model

Datums and coordinate system have been renamed (1 click)

Before:



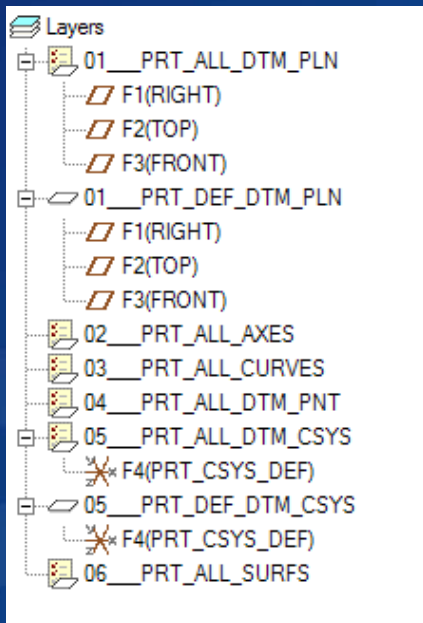
After:



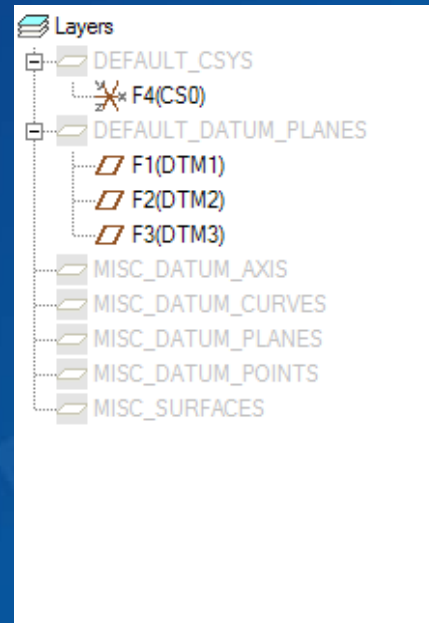
Case Study – Updating A Model

Layers are deleted, new ones are added and items are placed Correctly. Layers are hidden as required (5 clicks)

Before:

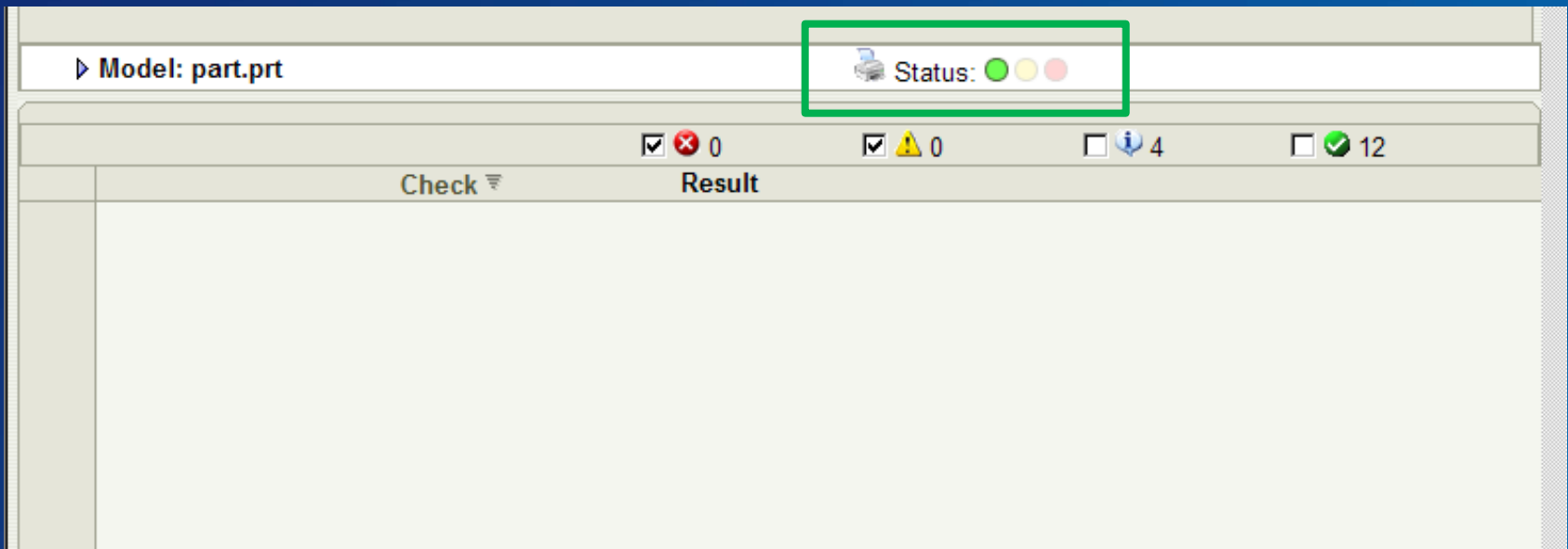


After:



Case Study – Updating A Model

Model now passes checks under the Repair configuration.
Total time from file Open to Save = < 30 seconds.



Part IV – Managing Your Configurations

Distribution:

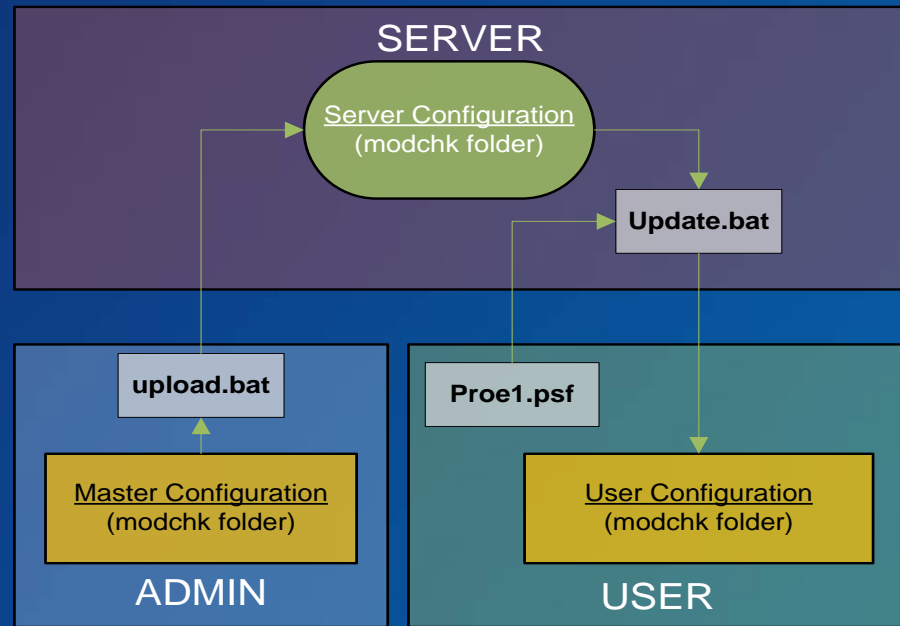
Updates to ModelCHECK configurations can be rolled out to users with relative simplicity using:

- Windows batch files
- Pro/E start file
- Common server location

2010

Updating

- Master Config
- upload_config.bat
- Server Config
- proe1.psf*
- update_config.bat*
- User Configuration



*See APPENDIX C for more information.

Updating

```
ENV=PROE_FEATURE_NAME=PROE_Flex3C ()  
RUN="%MECH_LP%\install\nt\pro_mech_env.bat"  
RUN="%PRO_DIRECTORY%\%PRO_MACHINE_TYPE%\nms\nmsd.exe" -noservice -  
timeout %NMSD_TIMEOUT% &  
RUN="%PRO_DIRECTORY%\%PRO_MACHINE_TYPE%\obj\xtop.exe"  
// USER - PSF  
// Add User specific environment or run applications below here  
RUN="\\<serverlocation>\update_config.bat"
```

C:\<loadpoint>\bin\proe1.psf

RUN command added to start file. ModelCHECK
downloads any updates upon start.*

*See APPENDIX C for more information.

Bottom Line

ModelCHECK:

- Can be configured to work for YOU, to help ensure that your products are on-time and error free.
- Is an excellent tool for validating and updating models and drawings, quickly and easily.
- Is available to anyone who wants to use it, and optimization takes no special equipment, software or skill.

Questions?

Evan Winter

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Appendix A

Start file options (Part mode):

- PRT_ADD_CHK_PARAM
- PRT_CREATE_VIEW
- PRT_DATUM_AXIS
- PRT_DATUM_CSYS
- PRT_DATUM_CURVE
- PRT_DATUM_PLANE
- PRT_DATUM_POINT
- PRT_FT_PARAMETER
- PRT_LAYER_MOVE
- PRT_LAYER
- PRT_UNITS_LENGTH
- PRT_UNITS_MASS
- MATERIAL_NAME
- PRT_MODEL_NAME
- PRT_INSTANCE_NAME
- PRT_SIMPREP_NAME
- PRT_PARAM_MAP
- PRT_PARAM_RENAME
- PRT_PARAMETER
- PRT_PRO_VERSION
- PRT_RELATION
- PRT_COMMENT
- PRT_PARAM_NOTE_REQ
- PRT_PARAM_NOTE_UNACC
- SHTMTL_BTNAME
- PRT_STD_NOTE
- PRT_TOL_TYPE
- PRT_LAYER_UNWANTED
- PRT_PARAM_UNWANTED
- PRT_REL_UNWANTED
- MU_ACCURACY
- PRT_VIEW

Appendix A

Start file options (Assembly mode):

- ASM_ADD_CHK_PARAM
- ASM_CREATE_VIEW
- ASM_DATUM_AXIS
- ASM_DATUM_CSYS
- ASM_DATUM_CURVE
- ASM_DATUM_PLANE
- ASM_DATUM_POINT
- ASM_FT_PARAMETER
- ASM_LAYER_MOVE
- ASM_LAYER
- ASM_UNITS_LENGTH
- ASM_UNITS_MASS
- ASM_MODEL_NAME
- ASM_INSTANCE_NAME
- ASM_SIMPREP_NAME
- ASM_PARAM_MAP
- ASM_PARAM_RENAME
- ASM_PARAMETER
- ASM_PRO_VERSION
- ASM_RELATION
- ASM_COMMENT
- ASM_PARAM_NOTE_REQ
- ASM_PARAM_NOTE_UNACC
- ASM_STD_NOTE
- ASM_TOL_TYPE
- ASM_LAYER_UNWANTED
- ASM_PARAM_UNWANTED
- ASM_REL_UNWANTED
- ASM_VIEW

Appendix A

Start file options (Drawing mode):

- DRW_FORMAT
- DRW_IGNORE_SHEETS
- DRW_LAYER
- DRW_LAYER_MOVE
- DRW_LAYER_UNWANTED
- DRW_MODEL_NAME
- DRW_NOTE_FONT
- DRW_NOTE_HEIGHT
- DRW_NOTE_UNACC
- DRW_PARAM_MAP
- DRW_PARAM_UNWANTED
- DRW_PRO_VERSION
- DRW_SYMBOL
- DRW_TABLE_CELLS

Appendix A

Start file options (External files):

- STD_ASM_INFO_FILE
- CUSTOM_CHECKS_FILE
- CUSTMTK_CHECKS_FILE
- STD_DRAFT_ANGLE_FILE
- STD_DRW_DTL_FILE
- STD_DRW_INFO_FILE
- STD_USER_LIST_FILE
- STD_HOLE_DIAM_FILE
- STD_PRT_INFO_FILE
- MC_REGEN_CONFIG_FILE
- RELATION_UPDATE_FILE
- STD_SHTMTL_THICK_FILE

Appendix B

Checks:

- accuracy_info
- add_chk_param
- asm_bom
- asm_features
- asm_more
- bound_info
- bulk_items
- buried_feat
- chamfer_child
- children_exist
- cosmetic_feat
- cyl_cut_slots
- cyl_diams
- datum_rename
- def_density
- default_child
- dim_overwrite
- draft_angles
- draft_child
- draft_geom
- drawing_gtols
- drawing_layers
- drawing_name
- dtm_axes_info
- datum_csys_info
- dtm_curve_info
- dtm_plane_info
- dtm_point_info
- duplicate_models
- early_chamfer
- early_cosmetic
- early_draft
- early_round
- edge_references
- erased_views
- ext_ref_info

Appendix B

Checks (Cont.):

- extra_layers
- extra_params
- family_info
- feature_info
- file_size
- format_name
- freeform
- frz_components
- ft_def_values
- ft_std_params
- gen_components
- global_intf
- hole_diams
- ignore_feat
- import_feat
- incomplete_feat
- insert_mode
- instance_name
- layer_dispstat
- layer_info
- layer_item_std
- layer_items
- layer_move
- layer_place
- layer_status
- layout_info
- low_tolerance
- material_info
- memory_space
- merge_feat
- minmaxtol_info
- mis_components
- model_name
- models_used
- named_feat
- note_font

Appendix B

Checks (Cont.):

- note_height
- note_info
- note_spell
- note_unaccept
- num_components
- num_draw_sheets
- overall_size
- overlap_info
- param_info
- param_note_req
- param_note_unacc
- param_rename
- param_spell
- paramcheck
- params_exist
- params_used
- plane_child
- plane_parent
- pro_version
- rc_incompleted
- reg_features
- regen_dims
- regen_errs
- regen_wrns
- relation_comm
- relation_errs
- relation_info
- relation_miss
- relation_multi
- round_child
- rulecheck_info
- sharp_edges
- sheet_size_info
- short_edges
- shtml_yfactor
- shtml_bendtab

Appendix B

Checks (Cont.):

- shtml_flat
- shtml_thick
- shtml_unbends
- shtml_prep_info
- shtml_prep_name
- sla_info
- small_cylsrf
- srf_edges
- startcheck
- std_dtl_setup
- std_symbols
- sup_components
- sup_features
- symbol_info
- table_cells
- title_info
- title_spell
- udf_info
- units_length
- units_mass
- unq_components
- unused_models
- view_info
- xsec_info

Appendix C

Additional customization:

Customizing Load Config menu:

setconf.mcc:

```
# ModelCHECK text file to name configurations...
# 8-27-09
#
Large =(check/largemod_checks.mch) (start/...
#
Standard =(check/default_checks.mch) (start/...
#
Validation =(check/validation_checks.mch) (...
#
Repair =(check/repair_checks.mch) (start/...
#
Non_Contract =(check/custom_checks.mch) (...
```

...config\text\msg_mc.txt:

```
%CILabel1
Large Config
%CILabel2
Standard Config
%CILabel3
Validation Config
.
.
%CIMessage1
Select Large Config from setconf.mcc.
%CIMessage2
Select Standard Config from setconf.mcc.
%CIMessage3
Select Validation Config from setconf.mcc.
.
.
```

Note: **CNFG_SELECT_AUTO** must be set to **N** in config_init.mc for **Load Config** menu availability.

Appendix C

Additional customization:

Sample batch files:

upload_config.bat (Admin):

```
@ECHO OFF
XCOPY C:\<admin loadpoint>\modchk \\<common server location>\modchk /E /W /I
PAUSE
END
```

update_config.bat (User):

```
@ECHO OFF
XCOPY \\<common server location>\modchk C:\<user loadpoint>\modchk /E /I /Y
md D:\proe_data\mc_reports
md D:\proe_data\mc_metrics
PAUSE
END
```