

T/HIS 21.0

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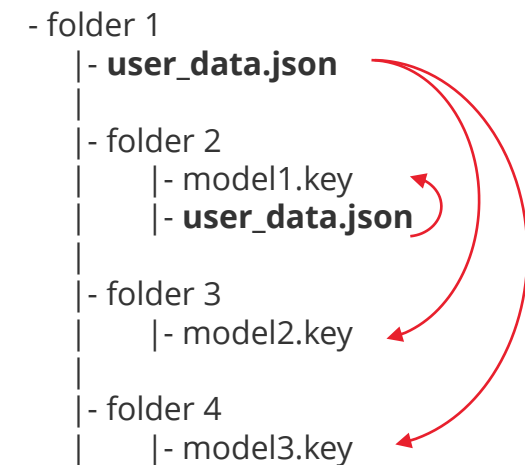
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Workflows User Data

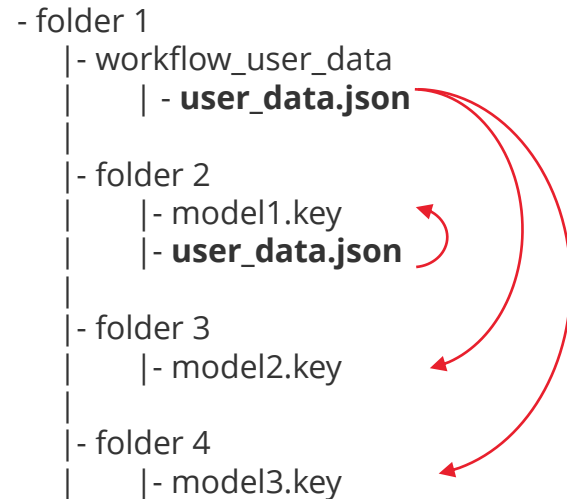
- We have made it easier for you to save Workflows user data to be re-used by multiple models and LS-DYNA runs.
- In Oasys 20, the JSON user data file written by a workflow tool had to be saved in the same folder as the model/results. This meant that if you had multiple variations of a model, you had to have copies of the same JSON file in each model/results folder, which was time consuming if edits needed to be made to the data.
- In Oasys 21, JSON user data can now also be saved in the parent folders of models, meaning the same data can be used for multiple models. The model folder is searched first, and then parent and grandparent folders are searched for valid JSON files. Preference **oasys*workflow_max_upward_folder_search_depth** can be set to control the number of parent folders that are searched. The default is 4.

In this folder structure [right], the user_data.json file in **folder 1** will be used for the models in folder 3 and folder 4, and the user_data.json file in **folder 2** will be used for the model in folder 2:



Workflows User Data

- The scan will also look for user data in a folder named '**workflow_user_data**' in the model folder and its parent folders.
- For example, in the folder structure below, the user_data.json file in **folder 1/workflow_user_data** will be used for the models in folder 3 and folder 4, and the user_data.json file in **folder 2** will be used for the model in folder 2:



- The name of the folder to search can be changed by setting the preference **oasys*workflow_user_data_directory_name**

Automotive Assessments

In Oasys 21 the assessment values and scores are now presented in a table making it easier to view the results

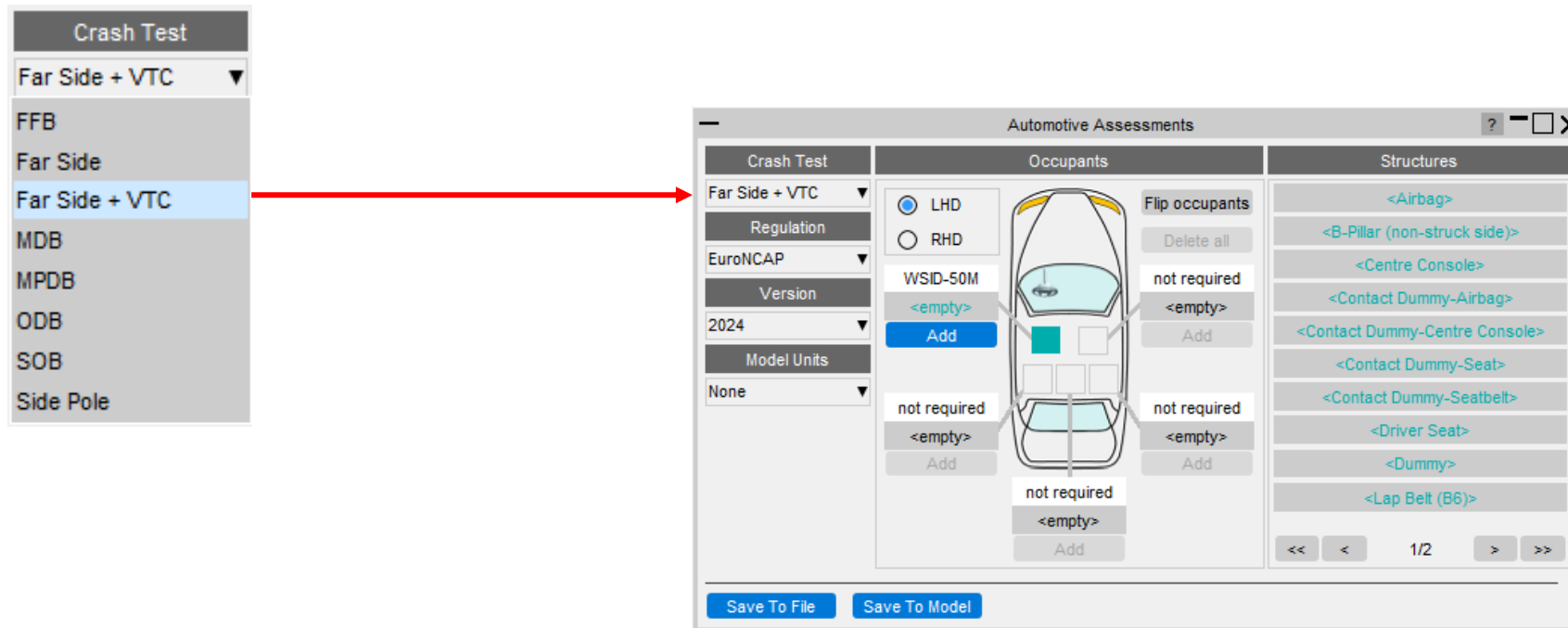
The screenshot displays the 'Automotive Workflow POST' software interface for a 'Crash Test: ODB'. The interface is divided into several sections:

- Regulation:** EuroNCAP, Rating Version: 2017, Unit Systems: M1 - U2 (mm, t, s).
- Occupants:** Driver, Front-passenger.
- Body Parts:** HEAD, NECK, CHEST, FEMUR, KNEE.
- Occupant Assessment Types:** LEFT_KNEE_COMPRESSION, RIGHT_KNEE_COMPRESSION.
- Structures:** A-Pillar, Accelerator Pedal, Brake Pedal, Clutch Pedal, Steering Column.
- Structure Assessment Types:** (Empty)
- Options:** Graphs on same page (selected), Graphs on separate pages, Overwrite existing graphs (selected), Append to existing graphs.
- Buttons:** Plot, Import ISO-MME...
- Output Table:** A table with 8 columns: Tag, Location, Assessment Type, Parameter, Value, Duration, Score, Curve. Two rows are highlighted: one with a yellow background (Score: 3.776) and one with a green background (Score: 4.000).

Tag	Location	Assessment Type	Parameter	Value	Duration	Score	Curve
M1	Front passenger	LEFT_KNEE_COMPRESSION	Max	6.50343 mm		3.776	->
M1	Front passenger	RIGHT_KNEE_COMPRESSION	Max	2.58155 mm		4.000	->

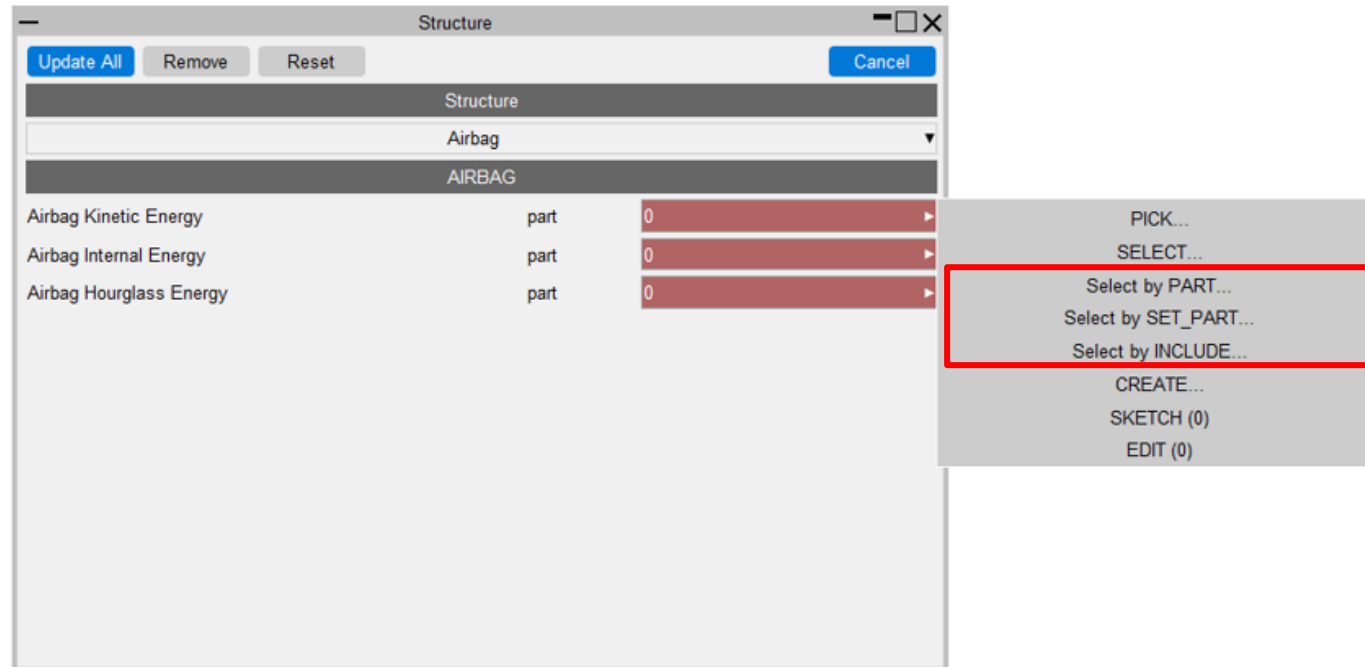
Far Side + VTC crash test

- New **Far Side + VTC** crash test has been added in the Automotive Assessments workflow to support [Virtual Testing](#).
- Includes support for all 115 channels (Occupants + Structures) required for the [Euro NCAP Virtual Far Side Simulation & Assessment Protocol](#)



Improved entity selection for multiple parts

- To facilitate multiple PARTs selection, new options have been added in the Automotive Assessments entity selection popup:
 1. Select by PART
 2. Select by SET_PART
 3. Select by INCLUDE
- In the Far Side + VTC crash test, these options are useful for selecting multiple PARTs for structural channels like Kinetic Energy, Internal Energy, and Hourglass Energy, for Airbag, Centre Console, Driver Seat and Dummy.

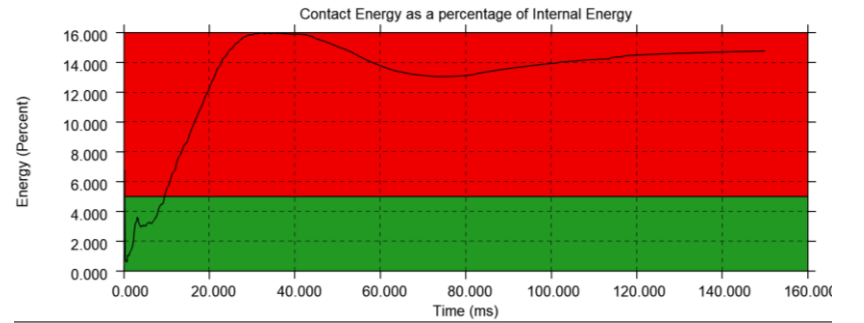
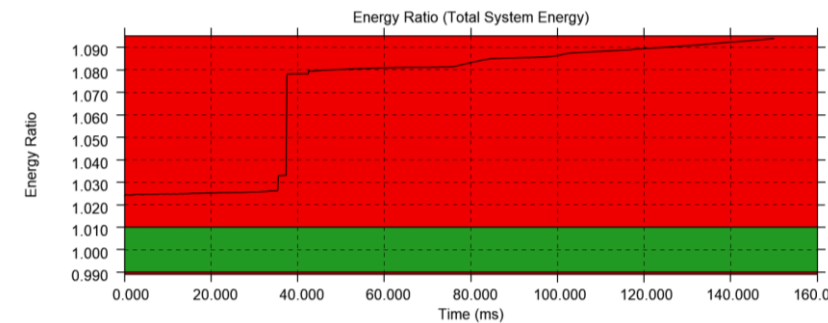
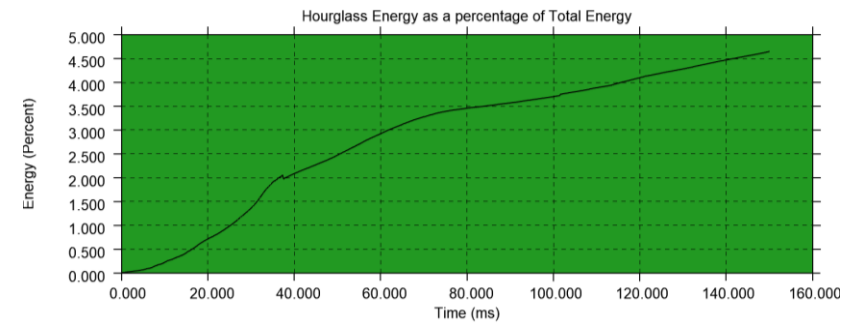
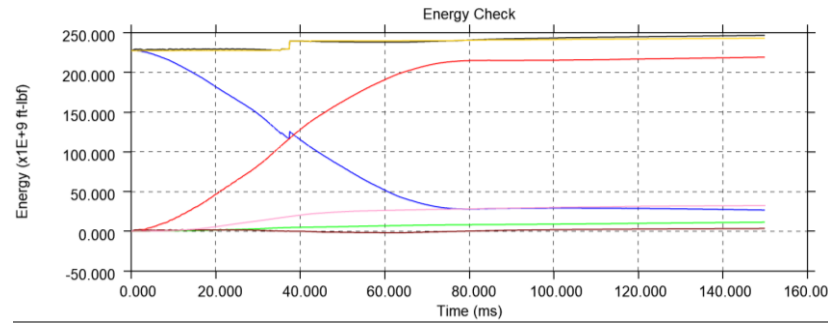


Updated support for different occupant versions

- We now support the DYNAmore/PDB WorldSID 50M occupant in versions 4.0, 6.0, 7.6 and 8.0 for left-hand and right-hand drive.
- We have reviewed and corrected various entity IDs and history titles in occupant JSON files that are supported in Automotive Assessments workflow. The list of occupant JSON files and corresponding manual referenced for checking are listed in this [table](#).

Energy Check

- Previously, the Energy Check tool simply plotted total, kinetic, internal and hourglass energy for your model. In Oasys 21, the tool now plots more energies, produces visual checks, and more.



Energy Check

Hourglass Energy is within your tolerance of Total Energy ✔

Absolute Total Contact Energy has hit a maximum of 15.99% of Internal Energy. This exceeds your tolerance of 5% ✘

Energy Ratio (Total System Energy) has increased to 1.09. This exceeds your tolerance of 1% ✘

Model Units U6 (m, t, s) Hourglass Energy Warning 5 %

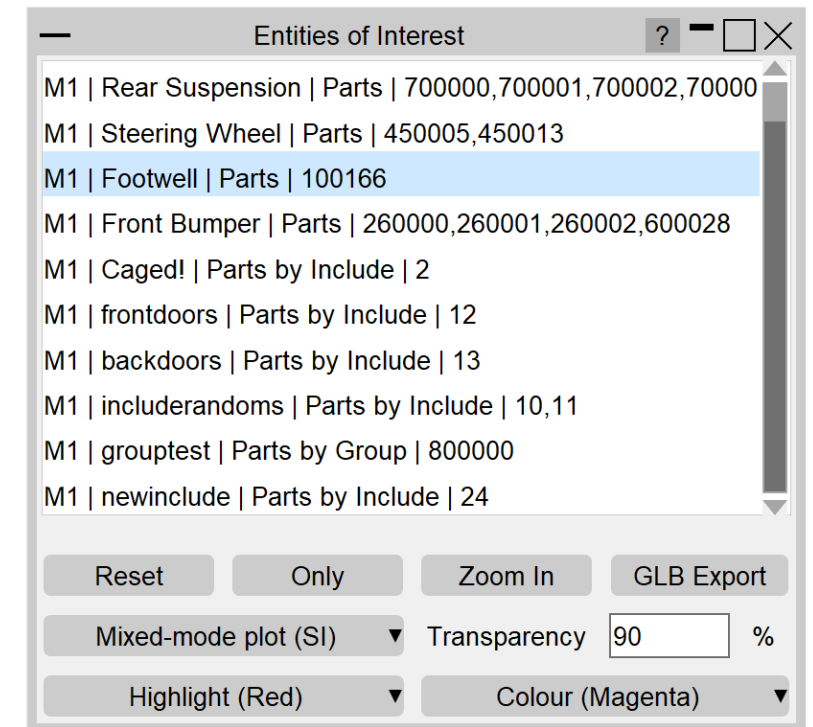
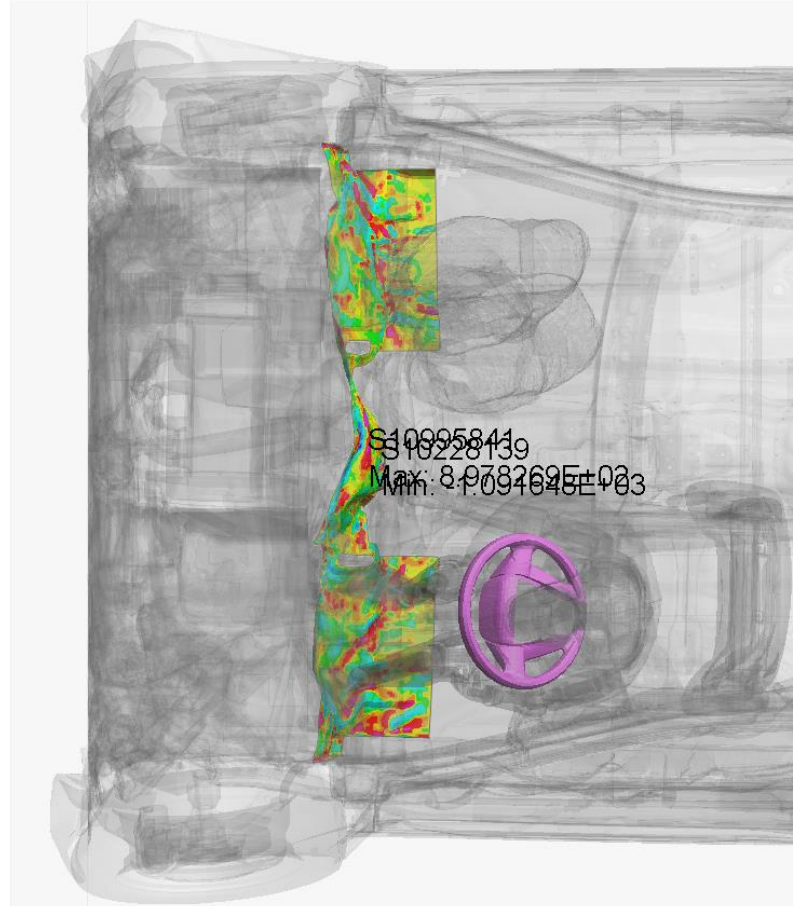
Display Time Units Milliseconds [ms] Contact Energy Warning 5 %

Display Energy Units Foot-Pounds [ft-lbf] Energy Ratio Tolerance 1 % Recalculate

Plot Parts with Greatest Total Energy (Max 6) 6 Plot Parts

Entities of Interest

- Previously, the Entities of Interest tool was able to Only, Highlight and complete GLB Exports for selected entities grouped by Parts or Part Sets. In Oasys 21, you can now Zoom In, Colour By and produce Mixed-Mode Plots grouped by Parts, Parts by Set, Parts by Include and Parts by Group.



The image shown is an SI Mixed-Mode Plot on the Footwell and Coloured by Magenta on the Steering Wheel

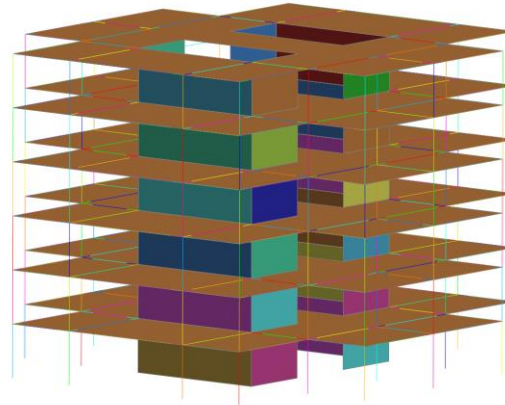
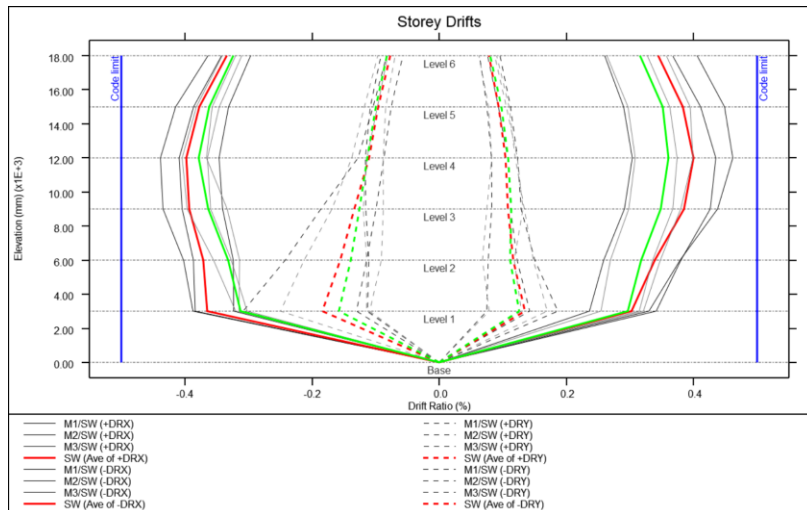
Seismic Workflows

Oasys 21 features new tools to power two of the most common seismic analysis workflows:

Storey Drift

In PRIMER, define drift nodes at different locations, for each storey.

In T/HIS, storey drifts are plotted for each location defined.

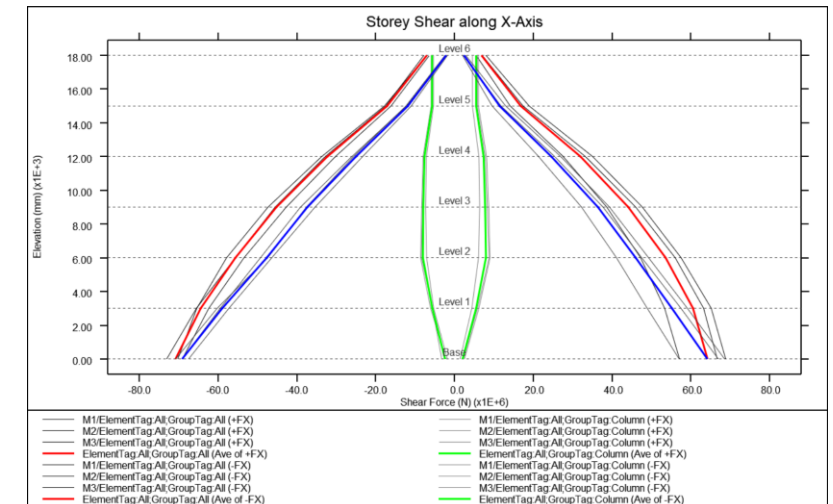


The Workflows can process a single model or a sweep of LS-DYNA runs for a set of ground motions.

Storey Force

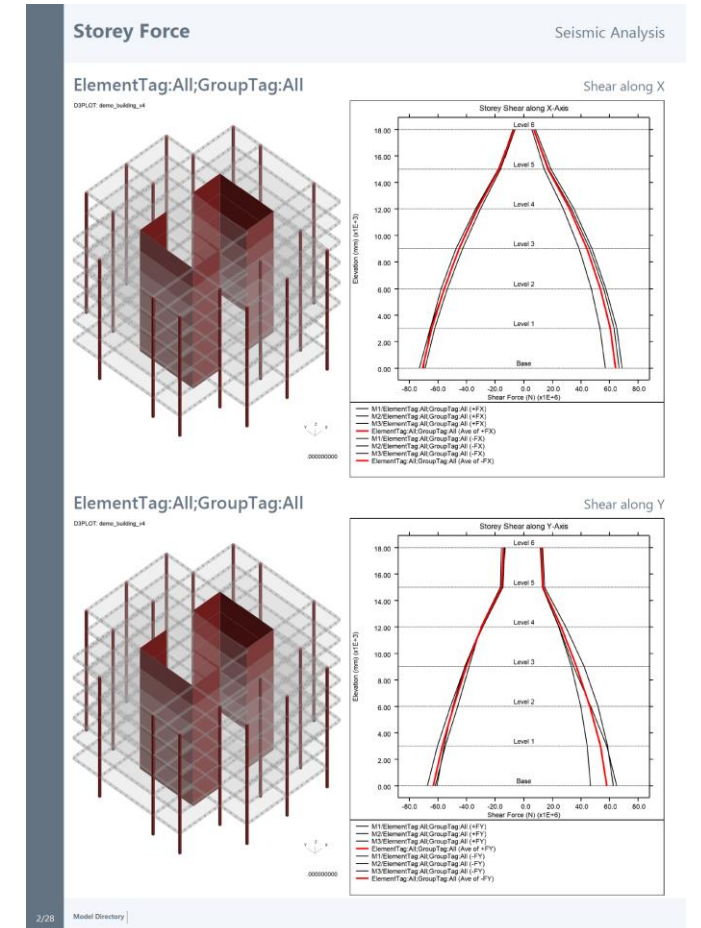
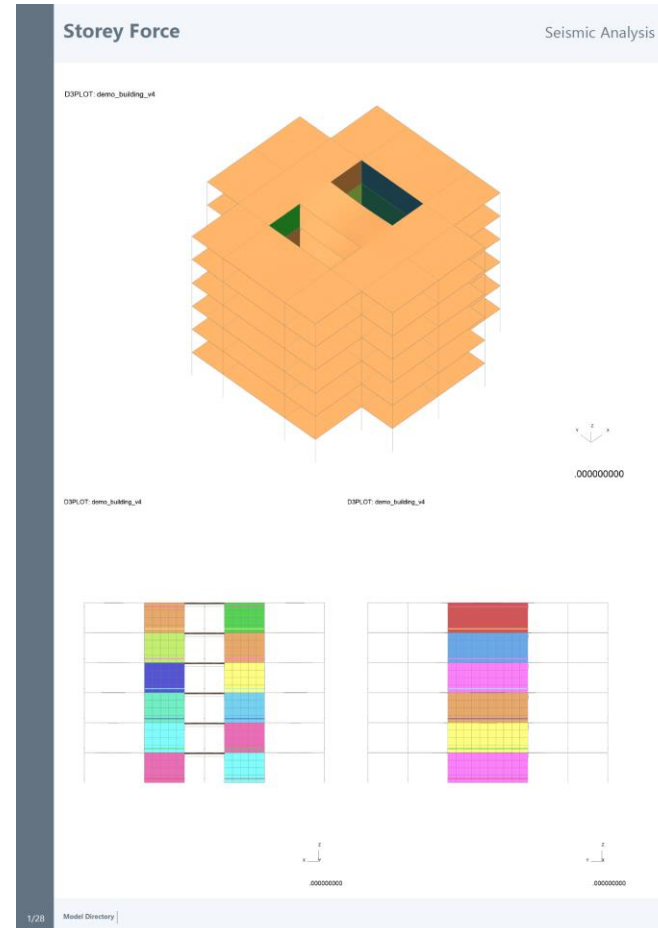
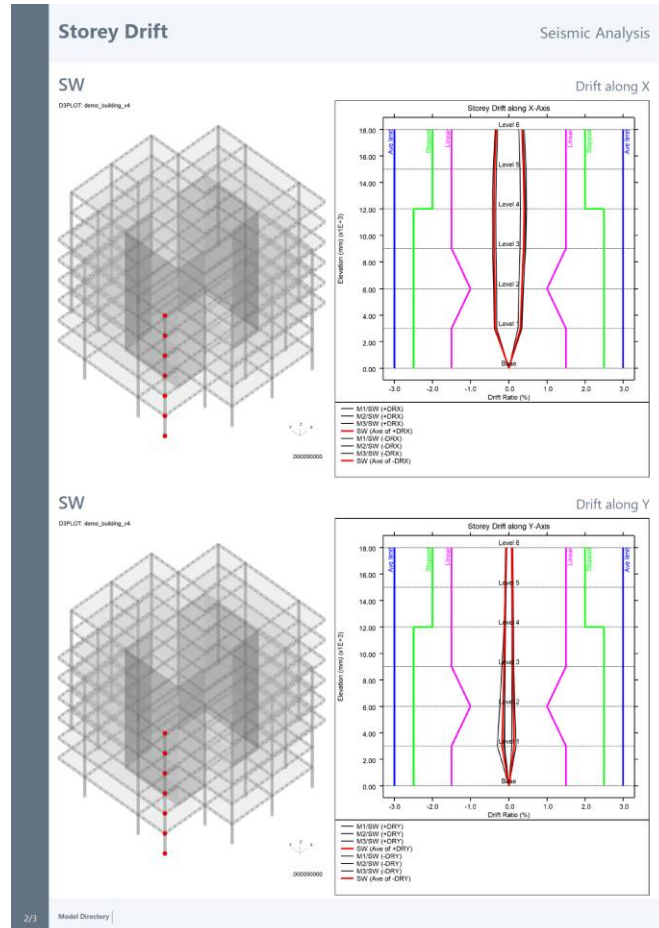
In PRIMER, define DATABASE_CROSS_SECTIONS for selected structural members grouped into SET_PARTs, for each storey.

In T/HIS, storey section forces are extracted for the cross-sections defined.



Seismic Workflows

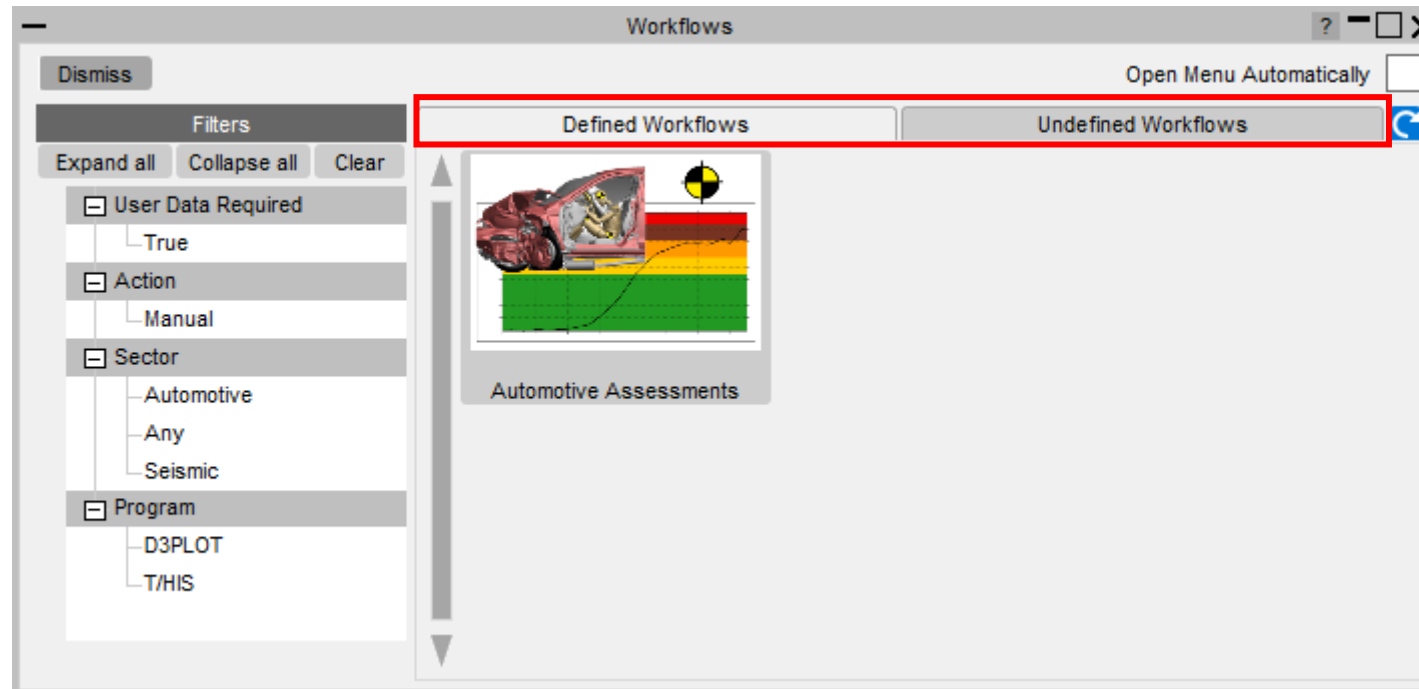
You can also generate automated reports with the REPORTER templates provided:



Defined and Undefined Workflows


The Workflows menu has been split into two tabs:

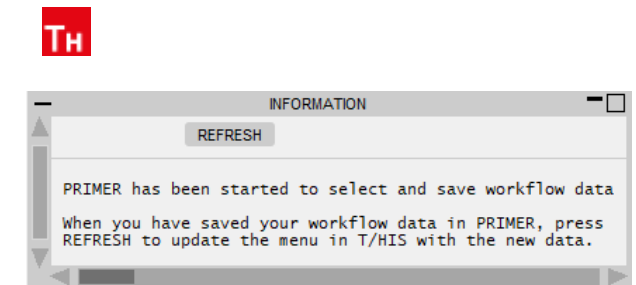
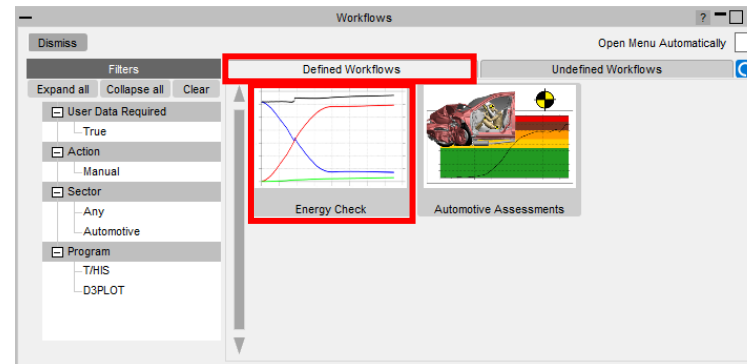
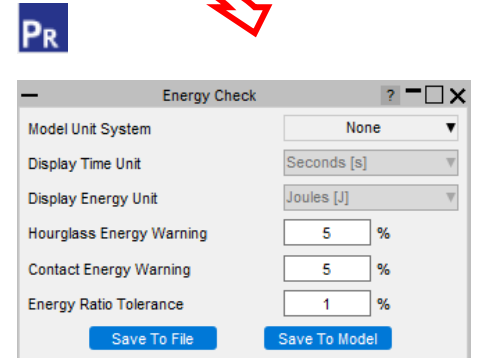
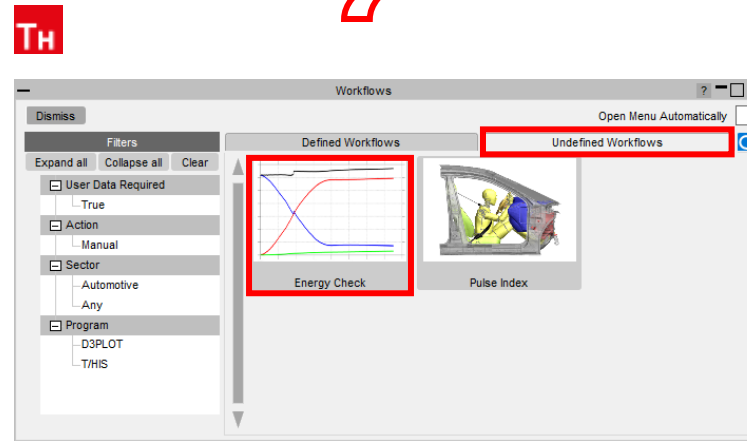
- **Defined Workflows** – shows workflows that can be run in T/HIS and have the required data
- **Undefined Workflows** – shows workflows that could be run in T/HIS, but don't have the required data



Defined and Undefined Workflows

Selecting a workflow in the **Undefined Workflows** tab will open the model in PRIMER and start the workflow to select the required data.

In T/HIS, a window will open telling you to press **Refresh**  when the data has been saved. This will update the Workflows menu, moving the workflow to the **Defined Workflows** tab so it can be run in T/HIS.



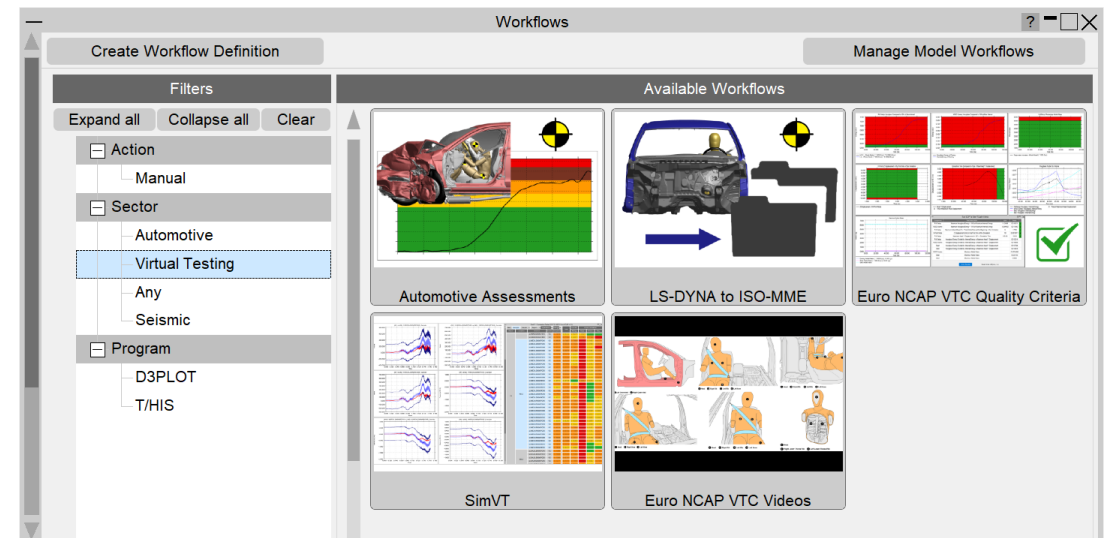
Virtual Testing

Virtual Testing

At Oasys Ltd., we are working on software features to support the upcoming Virtual Testing Crashworthiness protocols. The first protocol to be introduced is the [Euro NCAP Virtual Far Side Simulation & Assessment Protocol](#), with C-NCAP and others to follow soon.

Oasys 21 contains a set of integrated and complementary Workflow tools to power your Virtual Testing CAE workflows:

- [Automotive Assessments](#) (now includes support for the Euro NCAP Virtual Far Side protocol)
- [LS-DYNA to ISO-MME](#)
- [SimVT](#)
- [Euro NCAP VTC Quality Criteria](#)
- [Euro NCAP VTC Videos](#)



Virtual Testing

Virtual Testing presents several challenges for CAE workflows:

- Q1. Good correlation is moving from beneficial to mandatory. As CAE teams, we can no longer rely on conservative assumptions. How do we ensure that physical tests perform as predicted?**
- A1. [SimVT](#) is a powerful new tool for correlation analysis, providing flexibility, and the ability to interrogate correlation results in detail, to help you understand your models' accuracy, robustness, and sensitivity.
- Q2. How do we ensure that the format and quality of information is sufficient when submitting results to Euro NCAP? How to avoid rework and resubmission?**
- A2. Use the [Euro NCAP VTC Quality Criteria](#) tool to ensure your models meet the required standard. Use the [Euro NCAP VTC Videos](#) tool to provide the video evidence required. Use the [LS-DYNA to ISO-MME](#) tool to export your results data in the required format.
- Q3. CAE teams will need to work more with physical test data, and safety teams will need to work more with simulation. We will also be dealing with more metrics than ever before. How do we improve collaboration and processing?**
- A3. The [LS-DYNA to ISO-MME](#) tool provides seamless transition between simulation and test formats. [SimVT](#) supports test data stored in ISO-MME format as well as a configurable CSV format.
- Q4. How can we manage the large volume of data and processing required for Virtual Testing?**
- A.4 [SimVT](#) helps you summarise the correlation analysis results for all the occupant and structures data channels, as well as providing the ability to sift through the data in more detail. Other tools include REPORTER templates to automate the processing of data. Results tables, graphs and scores can be exported in various formats to link with your team's data management tools and processes.

Virtual Testing

- All the new Virtual Testing tools can be accessed from the **Tools** → **Workflows** menus in PRIMER, D3PLOT and T/HIS by filtering for **Virtual Testing**.
- REPORTER templates can be found at **File** → **Open Library Template...** by selecting the **Automotive** tab and filtering for **Virtual testing**.

The image displays two screenshots from the Oasys software interface. The top screenshot, titled 'Workflows', shows a 'Create Workflow Definition' panel on the left with a tree view under 'Sector' where 'Automotive' is expanded and 'Virtual Testing' is highlighted with a red box. The main area shows 'Available Workflows' with thumbnails for 'Automotive Assessments', 'LS-DYNA to ISO-MME', 'Euro NCAP VTC Quality Criteria', 'SimVT', and 'Euro NCAP VTC Videos'. The bottom screenshot, titled 'Library Templates', shows the 'Automotive' tab selected. A list of categories is on the left, with 'Virtual testing' checked and highlighted by a red box. The main area displays three template thumbnails: 'Euro NCAP VTC Quality Criteria', 'Euro NCAP VTC Videos', and 'LS-DYNA to ISO-MME'. A 'Selected template:' field is visible at the bottom right.

LS-DYNA to ISO-MME

- “LS-DYNA to ISO-MME” is a new Workflow tool to convert LS-DYNA results into the ISO-MME format specified by the Euro NCAP Virtual Far Side protocol.
- [Automotive Assessments](#) workflow user data removes the need to manually map LS-DYNA entities to ISO-MME channel codes.

1. In **PRIMER**, populate all the fields required by the Euro NCAP protocol. Contact data and Distance between head CoG and excursion lines can be populated automatically. When you save these, you can reuse the settings for subsequent LS-DYNA runs.
2. In **T/HIS**, perform the export to ISO-MME format. Solver and simulation information can also be populated automatically.

The screenshot displays the 'LS-DYNA to ISO-MME' software interface, divided into several sections:

- User data:** Fields include Test name (Far side), Laboratory name (Oasys LS-DYNA Environment), Customer name (Euro NCAP), Customer test ref number (001), Customer project ref number (1234), Virtual testing ref ID (FS_Pole_75_x-ref_z-ref_50M_Sim_1), Test date (30/01/2024), ISO-MME format (1.6), Title (Euro NCAP 2024), Regulation (Far side VTC), Type of data source (Simulation), Dummy Simulation Model Specification (WSID 50M v7.6), Reference to Dummy Model Qualification Documentation (WSID 50M v7.6.pdf), and Required output channels CSV (NCAP_VTC_Channels\EuroNCAP_VTC_LHD.csv).
- Contact data:** Fields include Contact Type between dummy and seat (S2S SOFT0 nu=0.2) and Contact Type between dummy and seatbelt (S2S SOFT1 nu=0.2).
- Vehicle data:** Fields include Name (TUG), Reference number (1234), Longitudinal velocity (20), Lateral velocity (12), and Mass (1000).
- Distance between head CoG and excursion lines:** Fields include Distance between head CoG and green line (0.520), Distance between head CoG and yellow line (0.645), Distance between head CoG and orange line (0.770), and Distance between head CoG and red line (0.8).

Buttons for 'Save to file', 'Save to model', 'Get contact information', and 'Calculate distance' are visible. A note at the bottom states: 'Textbox fields with this colour are required for successful LS-DYNA to ISO-MME conversion. Note that all fields are required to conform to the Euro NCAP VTC protocol.'

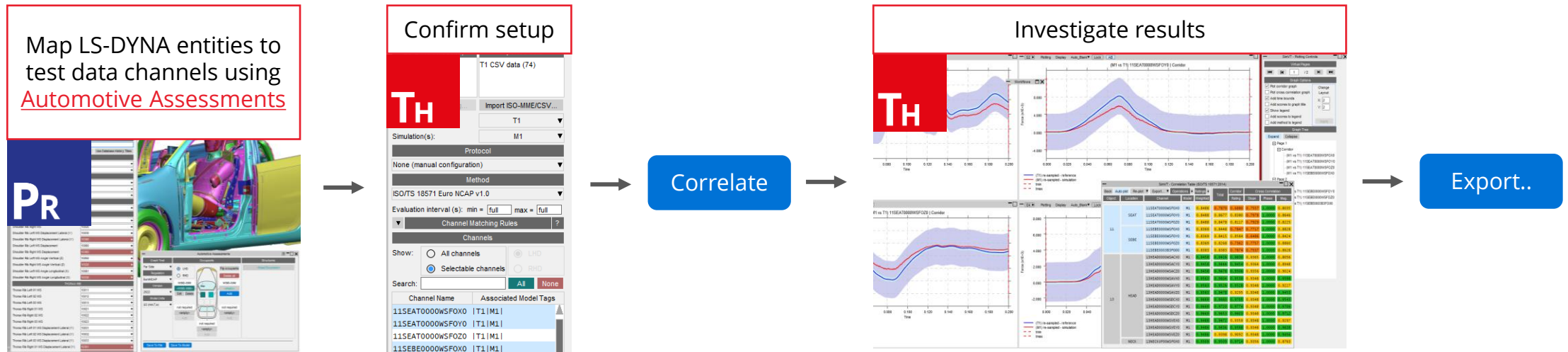
LS-DYNA to ISO-MME

- The LS-DYNA to ISO-MME Workflow can be automated using the REPORTER template provided. The report generated contains a summary of the ISO-MME file information and individual channel graphs.



SimVT

- SimVT is a powerful interactive tool for correlating simulation data vs test, or indeed any combination of: LS-DYNA models, ISO-MME data or CSV data.
- SimVT supports the Euro NCAP Virtual Far Side Simulation & Assessment Protocol and can be used to identify sensors that fail to pass Validation Criterion 1.



The SimVT Workflow

SimVT

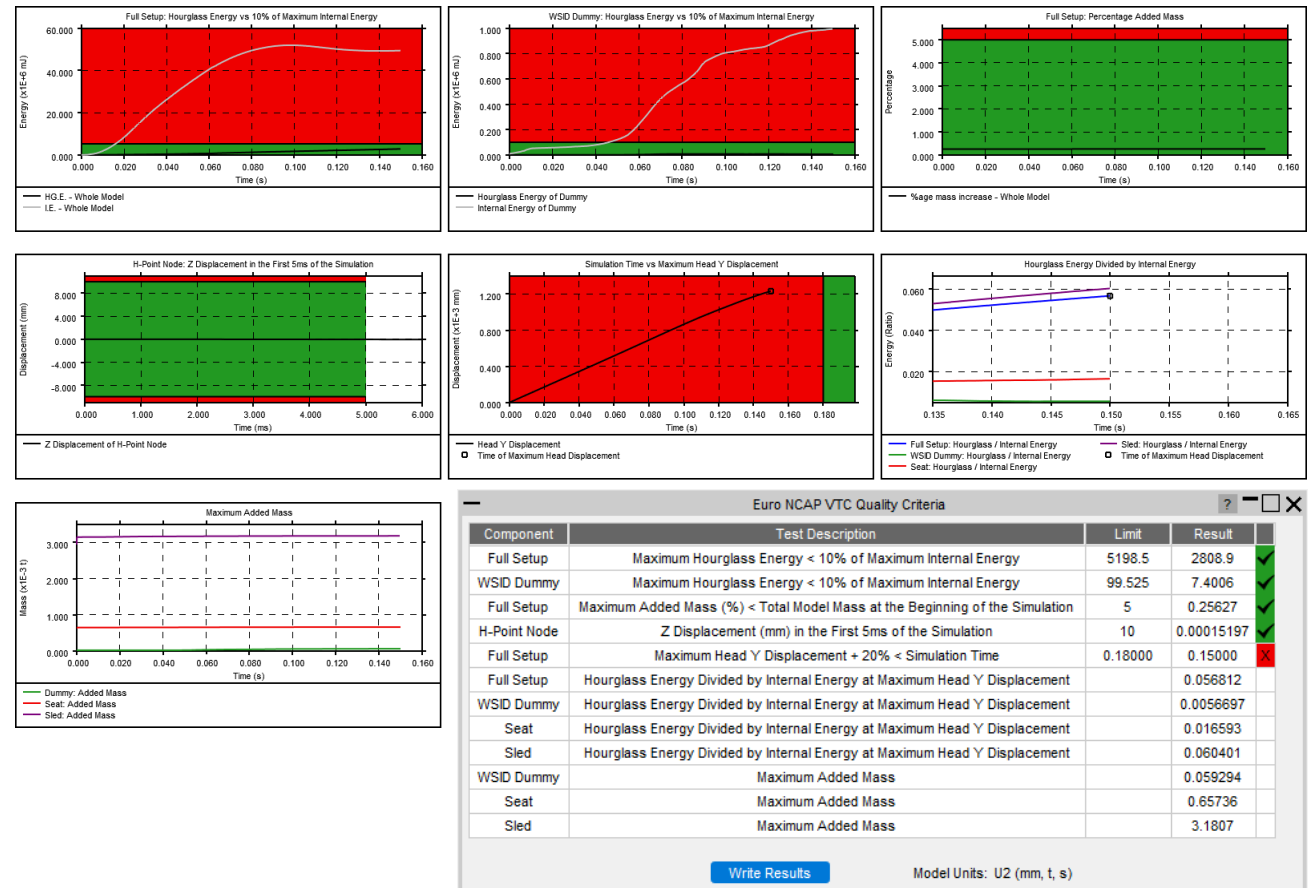
- SimVT seamlessly aligns simulation curves to tests using ISO-MME Channel Codes.
- You can create custom rules for pairing approximate matches.
- Hundreds of correlations are achievable with a single click.
- Results are displayed in a table and can be exported to CSV.
- Graphs of all correlations can be easily plotted and navigated.
- Settings files can be saved to restore previous sessions.



Euro NCAP VTC Quality Criteria

- “Euro NCAP VTC Quality Criteria” is a new, convenient tool for assessing the quality criteria specified in section 6.1 of the Euro NCAP Virtual Far Side protocol.

1. In **PRIMER**, select the model entities required for the quality checks, and the relevant model and display units. Saved user data can be reused for subsequent LS-DYNA runs.
2. In **T/HIS**, the quality checks are calculated immediately. Graphs illustrate the results of each check. A summary table appears, with the option to write the results to a CSV file.



Euro NCAP VTC Quality Criteria

- The Euro NCAP VTC Quality Criteria Workflow tool can be automated using the REPORTER template provided.

Euro NCAP VTC Quality Criteria 2024 (Version 1.0)

Summary				
Component	Test Description	Value	Limit	Result
Full Setup	Maximum Hourglass Energy < 10% of Maximum Internal Energy	2.8089e+6	5.1985e+6	PASS
WSID Dummy	Maximum Hourglass Energy < 10% of Maximum Internal Energy	7400.6	99525	PASS
Full Setup	Maximum Added Mass (%) < Total Model Mass at the beginning of the simulation	0.25627	5	PASS
H-Point Node	Z Displacement (mm) in the first 5 ms of the simulation	70.006	10	FAIL
Full Setup	(Time of Maximum Head Y Displacement) + 20% < Simulation Time	0.15	0.18	FAIL
Full Setup	Hourglass Energy divided by Internal Energy at Time of Maximum Head Y Displacement	0.056812	[monitored]	[monitored]
WSID Dummy	Hourglass Energy divided by Internal Energy at Time of Maximum Head Y Displacement	0.0056697	[monitored]	[monitored]
Seat	Hourglass Energy divided by Internal Energy at Time of Maximum Head Y Displacement	0.016593	[monitored]	[monitored]
Sled	Hourglass Energy divided by Internal Energy at Time of Maximum Head Y Displacement	0.060401	[monitored]	[monitored]
Dummy	Maximum Added Mass	5.9294e-5	[monitored]	[monitored]
Seat	Maximum Added Mass	0.00065736	[monitored]	[monitored]
Sled	Maximum Added Mass	0.0031807	[monitored]	[monitored]

1/8 Model | C:\Users\harry.graham\Documents\Work\QualityCheck\far_side_Pole_2022.key

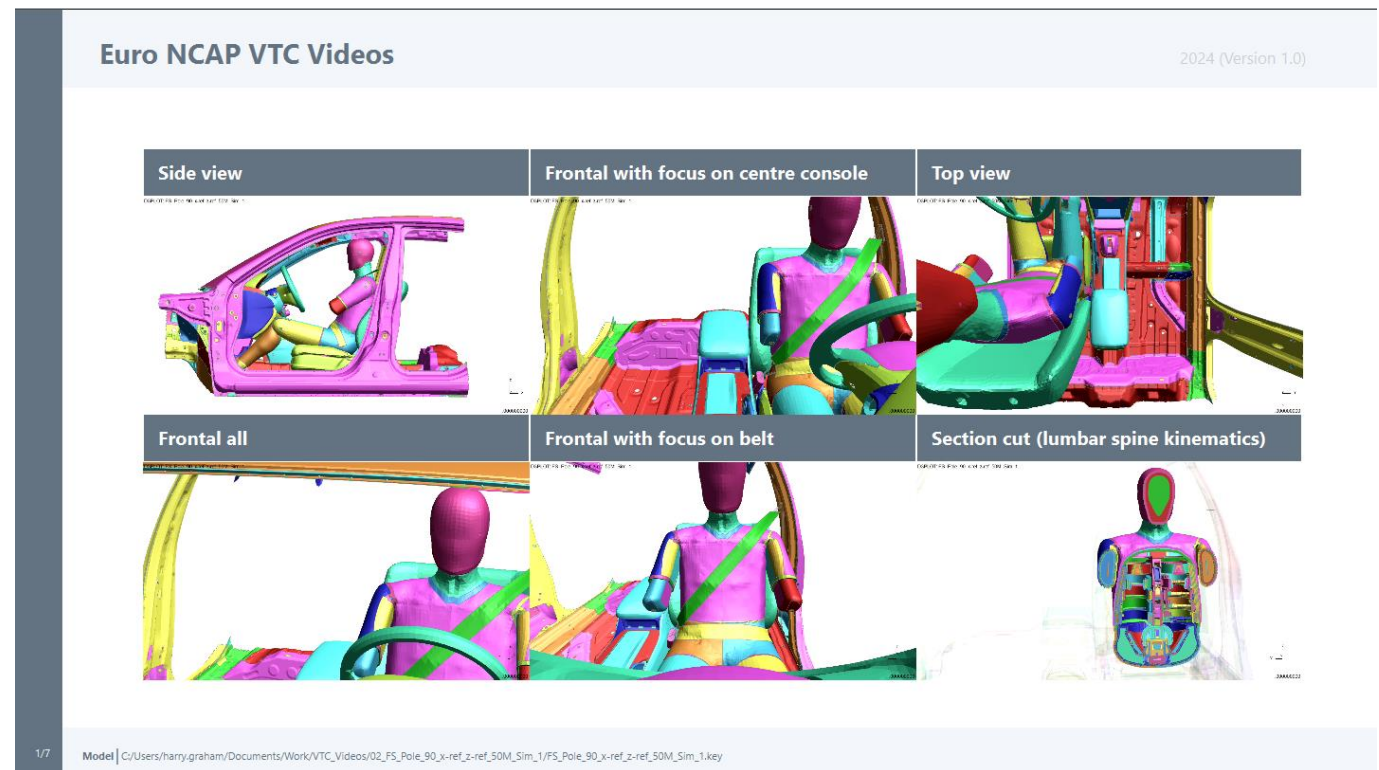
Euro NCAP VTC Quality Criteria 2024 (Version 1.0)

Criterion	Limit	Value	Result	Percent
"Maximum Hourglass Energy of full setup must be <10% of maximum Internal Energy"	5.1985e+6	2.8089e+6	PASS	5.4033

2/8 Model | C:\Users\harry.graham\Documents\Work\QualityCheck\far_side_Pole_2022.key

Euro NCAP VTC Videos

- The **Euro NCAP VTC Videos** Workflow tool helps you calculate the views and export the videos specified in section 5.2.1 of the Euro NCAP Virtual Far Side protocol.
- The tool attempts to calculate the camera positions automatically based on model entities you define in **PRIMER**. You can then adjust and save the views in **D3PLOT** to be reused to capture the videos for future LS-DYNA runs. The whole process can be automated using the **REPORTER** template provided.



ISO-MME Export

ISO-MME Export

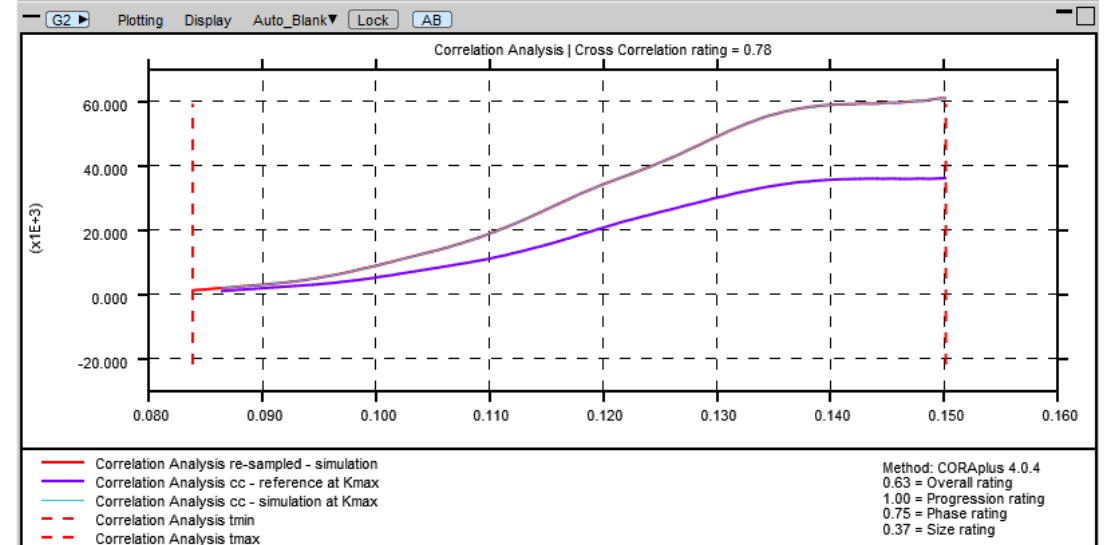
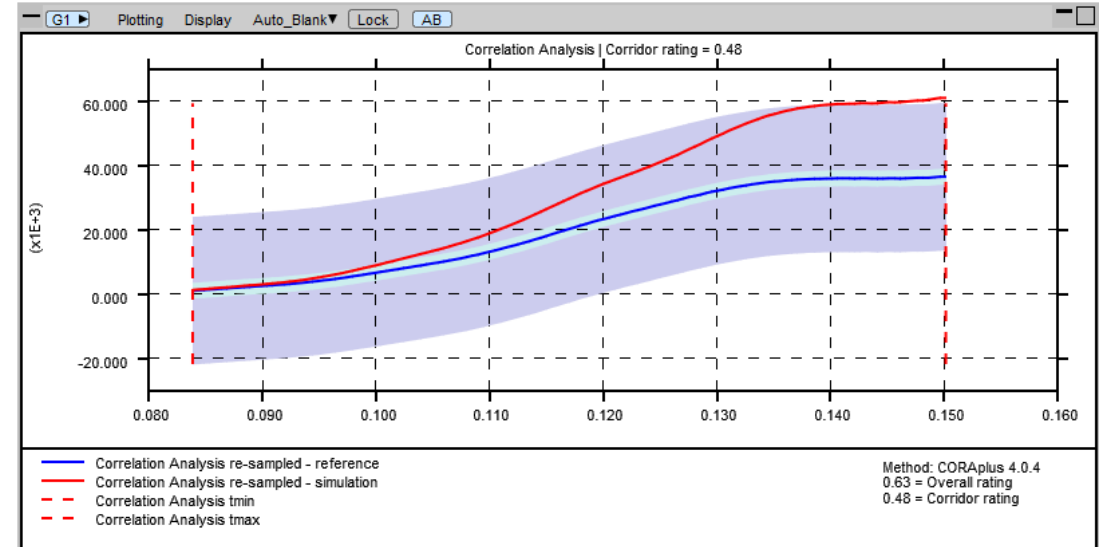
- T/HIS can now read and write both ISO-MME versions 1.6 and 2.0.
- The configuration file structure for exporting ISO-MME Output has been revised to accommodate channels that do not belong to pre-defined objects.
- You can now perform operations on defined channels using the configuration files to export them as separate channel curves.
- Comprehensive information regarding the configuration file changes is available in the T/HIS manual.

```
{
  "thisVersion": "21",
  "thisBuildNumber": "6455",
  "testName": "Far side",
  "timestamp": "19/04/2024, 02:22:31",
  "virtualTestingReferenceId": "FS_Pole_75_x-ref_z-ref_50M_Sim_1",
  "formatVersion": "1.6",
  "unitSystemModel": "U2",
  "unitSystemDisplay": "U1",
  "descriptors": [
    {
      "description": "Title",
      "value": "Euro NCAP 2024",
      "label": "title"
    }
  ],
  "dummies": [
    {
      "testObject": "1",
      "position": "1",
      "vehicleTestObject": "1",
      "name": "FDB WSID 50M 7.6 RHD",
      "gender": "male"
    }
  ],
  "vehicles": [
    {
      "testObject": "1",
      "position": "0",
      "driverPosition": "1",
      "name": "TUG",
      "refNumber": "1234",
      "velocityLateral": 12,
      "velocityLongitudinal": 20,
      "mass": 1000,
      "impactSide": "RI"
    }
  ],
  "channels": [
    {
      "testObject": "1",
      "position": "1",
      "mainLocation": "HEAD",
      "fineLocation1": "00",
      "fineLocation2": "GB",
      "fineLocation3": "WS",
      "physicalDimension": "DC",
      "direction": "X",
      "filter": "0",
      "entityType": "node",
      "component": "coord X",
      "id": 10123,
      "xAxisInterval": 0.0001,
      "iso": true,
      "write": false
    }
  ],
  "operations": [
    {
      "comment": "Converting GB to 00 as that is the expected channel ISO code for VTC protocol",
      "operation": "mul",
      "input": [
        {
          "11HEAD00GBWSDCX0",
          1
        }
      ],
      "output": "11HEAD0000WSDCX0",
      "iso": true,
      "graph": false,
      "write": true
    }
  ]
}
```

CORA Tool

CORA Tool Enhancements

- Now supports ISO/TS 18571 Euro NCAPv1.0 method.
- New plotting features:
 - Corridor graph
 - Cross-correlation graph
- Enhanced graph customisation:
 - Include scores in legend and titles
 - Add method descriptions to legend



Per-Monitor DPI Awareness

(Windows platforms only)

Per-Monitor DPI Awareness

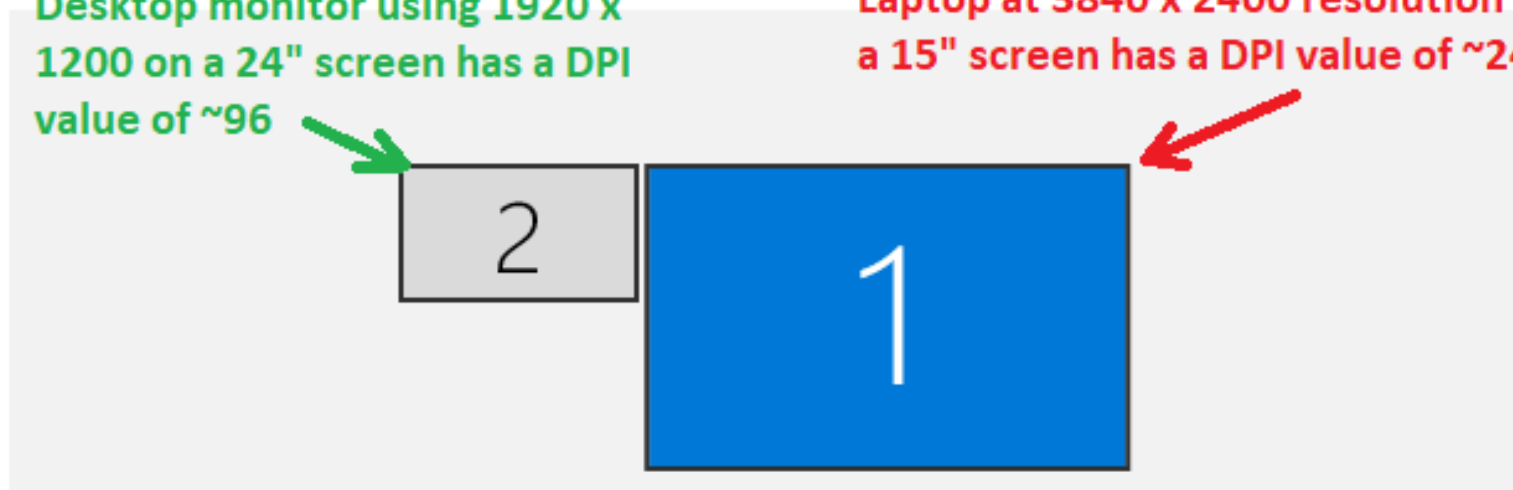
Windows 10 allows monitors of different resolutions to be used on a single desktop. For example, when a high-resolution laptop is attached to a lower-resolution monitor, you will see something like this in Windows “Display Settings”:

Rearrange your displays

Select a display below to change the settings for it. Press and hold (or select) a display, then drag to rearrange it.

Desktop monitor using 1920 x 1200 on a 24" screen has a DPI value of ~96

Laptop at 3840 x 2400 resolution on a 15" screen has a DPI value of ~240



Per-Monitor DPI Awareness

When the monitors have very different Dots Per Inch (DPI) values, windows will look either “too big” or “too small” when moved to a different monitor unless the application adjusts its fonts and other scaling. This was a problem with Oasys software before Oasys 21.

From Oasys 21 onwards, Oasys applications will detect when they are moved to a different monitor and will resize themselves and their contents to fit correctly. Specifically:

- The master application window will resize
- Fonts will resize
- Line widths and spacing in the user interface will resize

The appearance may not be identical, since fonts scale in integer steps of point size, but it should be close. Bear in mind that images are captured at the resolution of the monitor so consider this when creating images.

REPORTER Variables

Default names for REPORTER variables

- Before Oasys 21, REPORTER default variable names were prefixed with ITEM_ n , where n was the number of the item on the page in the T/HIS item tree. Because items in the T/HIS item tree are numbered from 1 on each page, it was common to have the same prefix for default variable names on multiple pages and therefore to have identical default variable names for items on multiple pages, resulting in variables being overwritten in REPORTER.
- In Oasys 21, default variable names are prefixed with the REPORTER item name, which defaults to a format like “this6”, “this6_1” for T/HIS items. Since item names in REPORTER are unique, this ensures default variable names generated in T/HIS are also unique.

JavaScript API

JavaScript API: Behaviour of scripts using windows

- The way that scripts that use windows/GUIs are run has changed in version 21.
- All programs that have a graphical user interface (GUI) use an “event loop” to process any mouse/keyboard events.
T/HIS has a main “event loop” to process all of the program’s events.
- In version 20 and before, if a script created and showed a window, T/HIS would start a new “event loop” to manage and process that JavaScript window.
- The script would not return from the window Show() call until the window was hidden/closed.
i.e. showing the window would “block” execution of the script until the window was closed.
- When the window is closed, the script continues.
- When execution reaches the end of the script, the script is terminated.

JavaScript API: Behaviour of scripts using windows

- For example, in version 20 and earlier, in the following script, “Hello, world!” will not be printed until the window is closed because the call to `w.Show()` will not return until the window is closed.

```
// Create a window with a widget
var w = new Window("Test", 0.5, 0.6, 0.5, 0.6);
var l = new Widget(w, Widget.LABEL, 0, 50, 0, 6, "Press X to close the window");

// Show the window and start event loop
w.Show();

// Print message
Message("Hello, world!");
```

- When the window is closed the message is printed and the script will then terminate as execution has reached the end of the script.

JavaScript API: Behaviour of scripts using windows

- In version 21 the behaviour has changed.
- If a script creates and shows a window, T/HIS will ***not*** start a new “event loop” to manage and process that JavaScript window.
- The window will now be processed from the main “event loop” in T/HIS .
- The script now returns from the window Show() as soon as the window is shown, and execution of the script continues.
i.e. showing the window no longer “blocks” execution of the script until the window is closed.
- When execution reaches the end of the script, the script is ***not*** terminated.
- The script continues running “in the background” as the script has shown a window.

JavaScript API: Behaviour of scripts using windows

- For example, in version 21, in the following script “Hello, world!” will be printed immediately after the window is shown, because the call to `w.Show()` returns after the window is shown.

```
// Create a window with a widget
var w = new Window("Test", 0.5, 0.6, 0.5, 0.6);
var l = new Widget(w, Widget.LABEL, 0, 50, 0, 6, "Press X to close the window");

// Show the window
w.Show();

// Print message
Message("Hello, world!");
```

- When the message is printed, the script will ***not*** terminate when execution reaches the end of the script. The script will continue to run “in the background”

JavaScript API: Behaviour of scripts using windows

- If a script that shows windows continues running “in the background”, and does not terminate when execution reaches the end of the script, how/when does the script terminate?
- A script that uses windows ***must*** now call `Exit` to terminate the script.

```
// Create a window with a widget
var w = new Window("Test", 0.5, 0.6, 0.5, 0.6);
var l = new Widget(w, Widget.LABEL, 0, 50, 0, 6, "Press X to close the window");

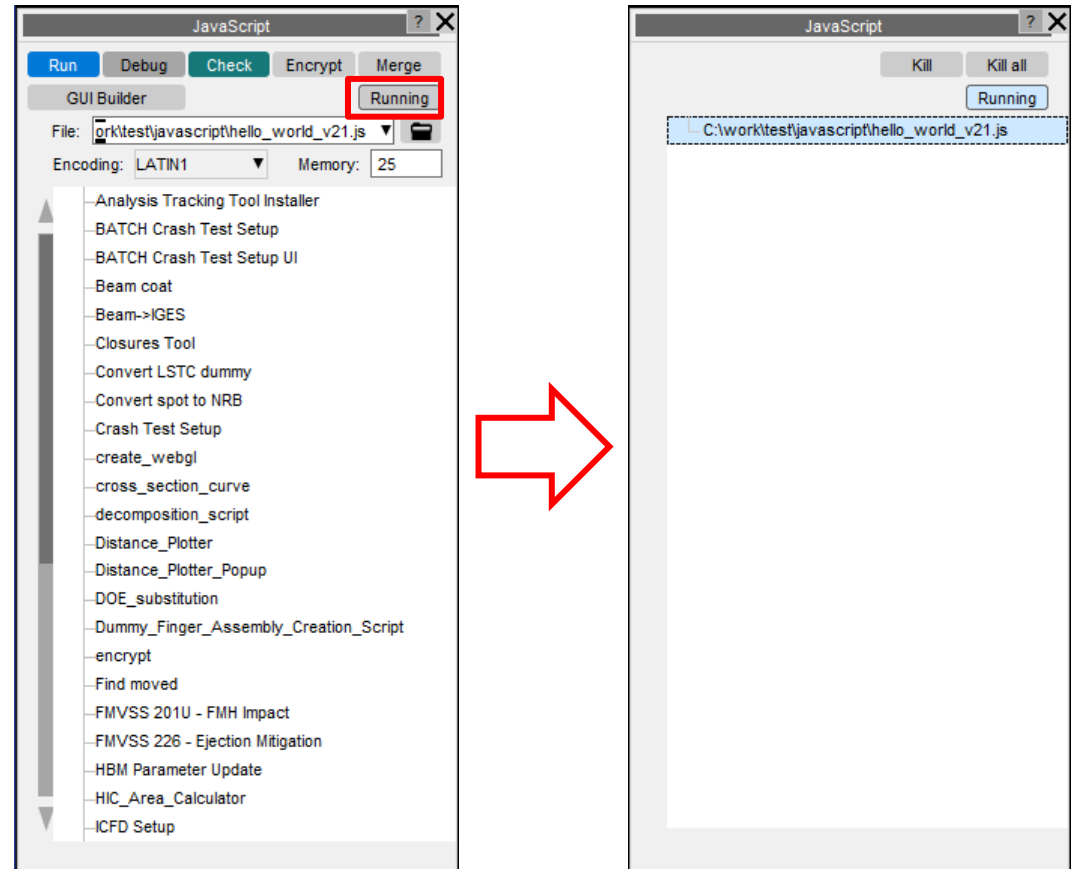
// Exit when window closed
w.onClose = Exit;

// Show the window
w.Show();

// Print message
Message("Hello, world!");
```

JavaScript API: Behaviour of scripts using windows

- To find what scripts are currently running there is a new “Running” tool in the JavaScript window.
- Any scripts that are currently running will be shown and can be terminated if required.



JavaScript API

New methods added to the Workflow class:

- WriteToFile() – writes a workflow to a JSON file
- WorkflowDefinitionFilename() – returns the workflow definition filename
- Refresh() – scans for fresh workflow data
- ModelUserDataProgramFromIndex() – returns the name of the program that the user data was written from
- ModelUserDataVersionFromIndex() – returns the version of the program that the user data was written from
- ModelUserDataBuildFromIndex() – returns the build number of the program that the user data was written from

JavaScript API

An extra optional argument has been added to `Workflow.WorkflowDefinitionFilename()`

- If defined it returns the filename of the workflow definition filename for the specified window
- If not defined it returns the workflow definition filename for the workflow selected by the user in the workflows menu

An extra optional argument has been added to `Workflow.NumberOfSelectedModels()`

- If defined it returns the number of models that have data for the specified workflow (out of the models that were selected by the user in the workflows menu).
- If not defined it works as before where it returns the number of models that were selected by the user in the workflows menu.

JavaScript API

An extra optional argument has been added to `Workflow.ModelIdFromIndex()`

- If defined it looks through the list of models that have data for the named workflow out of the models selected by the user and returns the model id of the model at the specified index in the list
- If not defined it works as before where it returns the model id of the model at the specified index in the list of models that were selected by the user

An extra optional argument has been added to `Workflow.ModelUnitSystemFromIndex()`

- If defined it looks through the list of models that have data for the named workflow out of the models selected by the user and returns the unit system of the model at the specified index in the list
- If not defined it works as before where it returns the unit system of the model at the specified index in the list of models that were selected by the user

JavaScript API

- An onHide event has been added to the Window class
- New method Build() added in Utils class to return T/HIS build number

Preferences

New Preferences

Preference	Description
oasys*workflow_only_use_specified_directory	Only scan location set by preference oasys*workflow_definitions_directory for Workflow definitions.
oasys*workflow_user_data_directory	Name of a folder to search in for workflow user data
oasys*workflow_max_upward_folder_search_depth	Maximum number of folders to search up to look for workflow user data
oasys*initial_view_orientation	Initial view orientation for the graphics window
this*file_buffer_size	File buffer size used for read THF (d3thdt) files
this*line_scale_dpi	Scale lines according to display DPI resolution

Contact Information

ARUP

www.arup.com/dyna

For more information please contact us:

UK

T: +44 121 213 3399

dyna.support@arup.com

China

T: +86 21 3118 8875

china.support@arup.com

India

T: +91 40 69019723 / 98

india.support@arup.com

USA West

T: +1 415 940 0959

us.support@arup.com

or your local Oasys distributor