

REPORTER 16.0

Getting started

February 2019

- Brief introduction to REPORTER
 - Starting REPORTER
 - Basic menu layout
 - Opening and closing templates and reports
 - Inserting and editing pages
- Example (bicycle crank design):
 - Adding a D3PLOT object
 - Adding a T/HIS object
 - Variables
 - Inserting Text items
 - Running REPORTER for multiple models

❖ *This tutorial is released together with example files (Crank Designs A, B and C) and a REPORTER template, 'reporter_crank_design_example_Feb2019.ort'.*

❖ *Note: Requires access to a valid license of Oasys D3PLOT, T/HIS and REPORTER.*

Oasys REPORTER

An Introduction

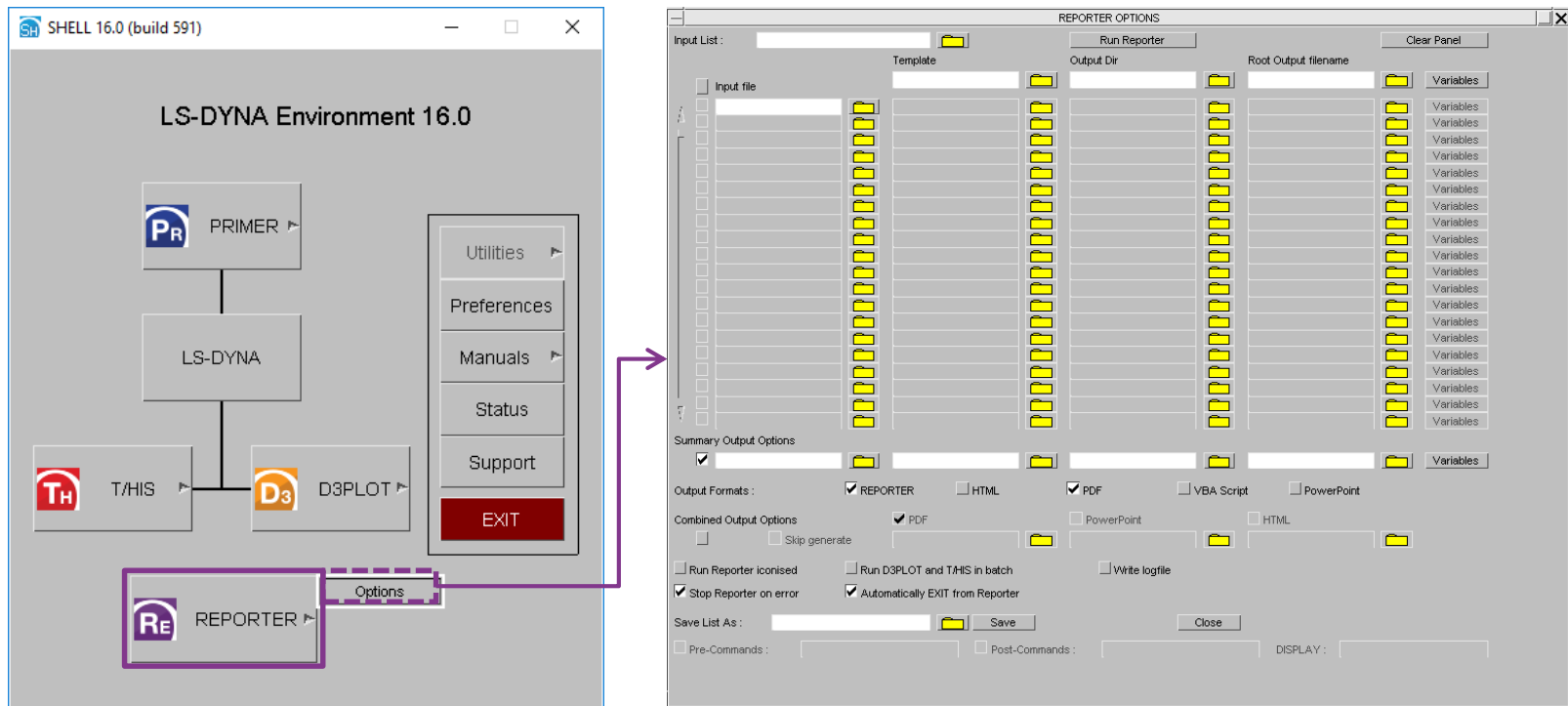
- REPORTER is designed to help you postprocess analysis results automatically. The idea is that you create a template which contains the instructions – or ‘recipe’ – for postprocessing results. When you run REPORTER on a set of results, it takes this template, applies it to the analysis and creates a report, which you can save in various formats (e.g. PDF, PowerPoint, HTML).
- REPORTER templates can help you automate the task of generating graphs of XY-data and 3D contour plots.
- You may also want to run a set of standard checks on a series of simulations. For example:
 - run termination
 - added mass
 - energy balance

You could create a checking template in REPORTER and then this could be generated for each analysis.

- A summary of the steps required to make a template is:
 1. Start REPORTER.
 2. Create a new empty template.
 3. Create pages (and a master page if required).
 4. Add objects to pages. These can be simple items such as shapes and text, or advanced items like D3PLOT or T/HIS objects.
 5. Use variables to make the template generic.
 6. Save the template.
- Once you have created a template you can apply it to your analysis as many times as you want:
 1. Start REPORTER .
 2. Open the template.
 3. Set the current analysis variable(s).
 4. Generate the report.
 5. Create output such as PDF, PowerPoint or HTML.

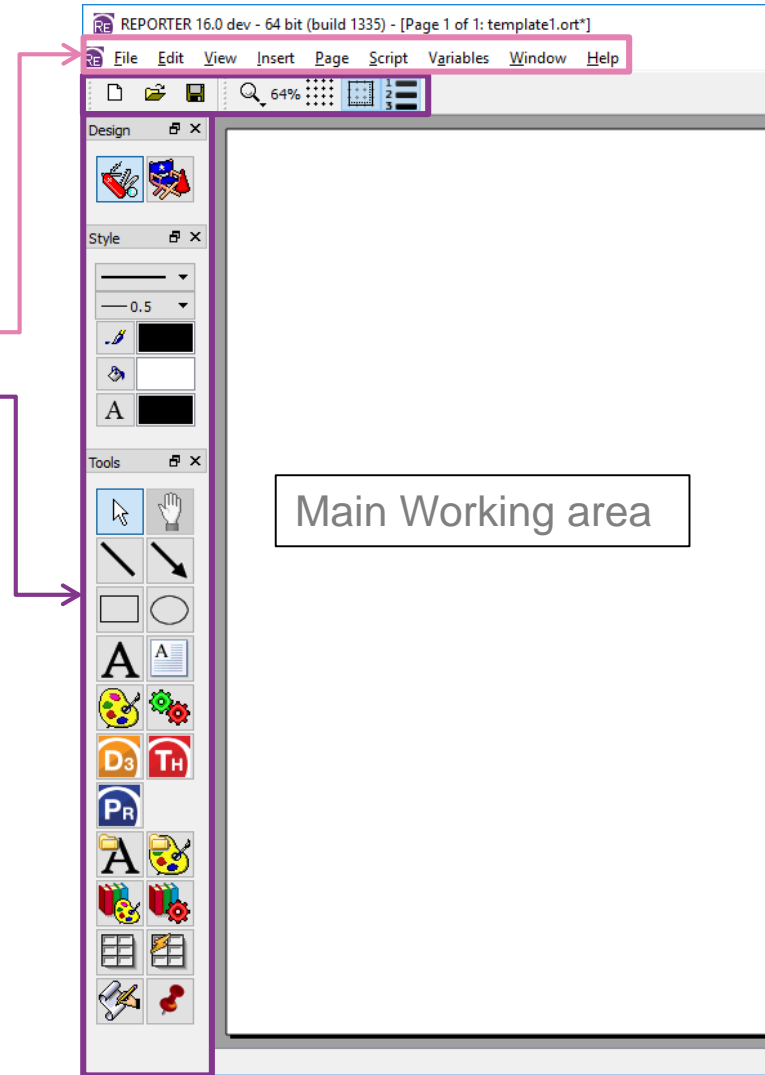
Starting REPORTER

- REPORTER is run by **left**-clicking the REPORTER button menu on Oasys SHELL.
- Alternatively, you can **right**-click on the button to give starting options for REPORTER. This allows you to run REPORTER on multiple analysis simulations in batch.



Basic menu layout

- REPORTER runs within a single window.
A typical REPORTER session will look like this:
- Within the main window there are a number of sections:
 - **Menu bar** - Access to the main drop-down menus.
 - **Toolbars** – explained on the next slide.



Basic menu layout



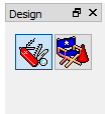
File toolbar

The file toolbar allows you to create a new template, open a template or save a template.

View toolbar

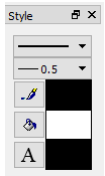


The view toolbar has the zoom controls. This is the same as using the Zoom submenu from the View menu. You can also control the grid and snap tools as well as view the page item generation order.



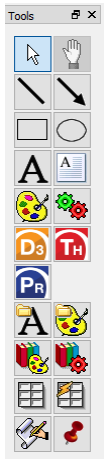
Design toolbar

The design toolbar buttons allow you to swap between **Design** view and **Presentation** view. This is explained later.



Style toolbar

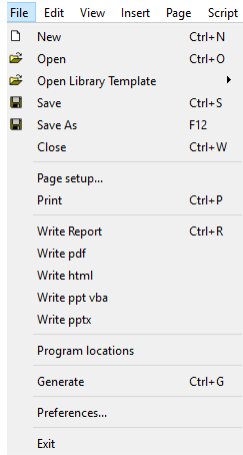
The style toolbar allows you to change the line width, line style, line colour, fill colour and text colour for REPORTER objects.



Tools toolbar

The tools toolbar contains the various REPORTER objects that can be placed on the page. These may be simple objects such as lines, rectangles, text, etc. or more advanced objects such as a D3PLOT or T/HIS object, or a script object.

Creating, opening and closing templates and reports



- Templates can be created, opened, or saved by either using the File menu or the File Buttons:



- **Creating a new template:** A new template can be created from the File menu (**File → New**) or by using the New File button.



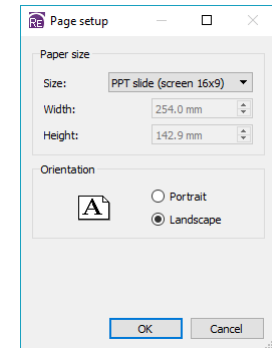
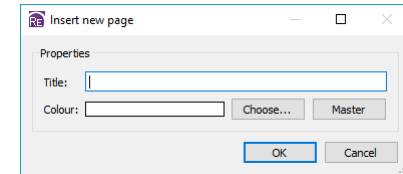
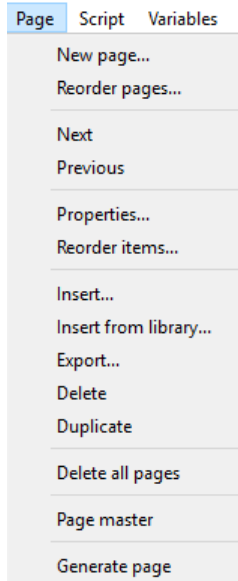
- **Reading an existing template or report:** An existing report or template can be opened from the File menu (**File → Open**) or by using the Open File button.



- **Saving a template (.ort):** A template can be saved by selecting **File → Save As** and selecting **Save as type: REPORTER Template files (*.ort)**.
- **Saving a report (.orr):** A report can be saved by selecting **File → Write Report**. The difference between a report (.orr) and a template (.ort) is that a template just contains the instructions of how to generate the report, whereas a report contains the **generated** objects as well.
- **Saving a PDF, PowerPoint or HTML version of the report:**
 - File → Write pdf
 - File → Write html
 - File → Write pptx

Inserting and editing pages

- **Adding a new page:** A new page can be added by selecting **Page → New page...** . This will bring up a Page layout window from which you can give the new page a title and set the background colour.
- **Deleting pages:** You can delete the current page you are working on by selecting **Page → Delete**.
- **Duplicating pages:** You can copy the current page by selecting **Page → Duplicate**.
- **Reordering pages:** You can change the order of the pages in the report by selecting **Page → Reorder pages...** .
- **Page Setup:** To control page size and orientation, select **File → Page setup...** .
- **Generating a single page:** Instead of generating the entire report you can generate a single page by selecting **Page → Generate page**. However, note that if some of the objects on the page require data that would be generated on previous pages and those pages have not yet been generated, the page generation will not work.



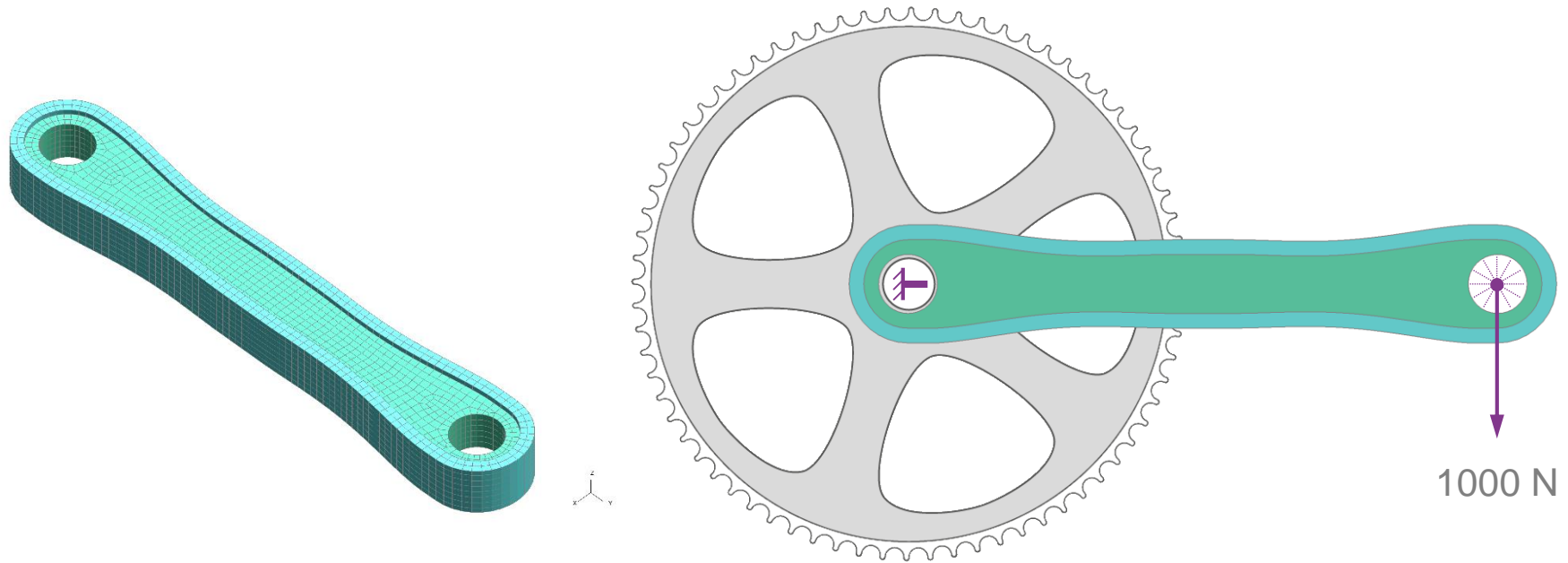
Example:

Bicycle crank

Simple example – bicycle crank

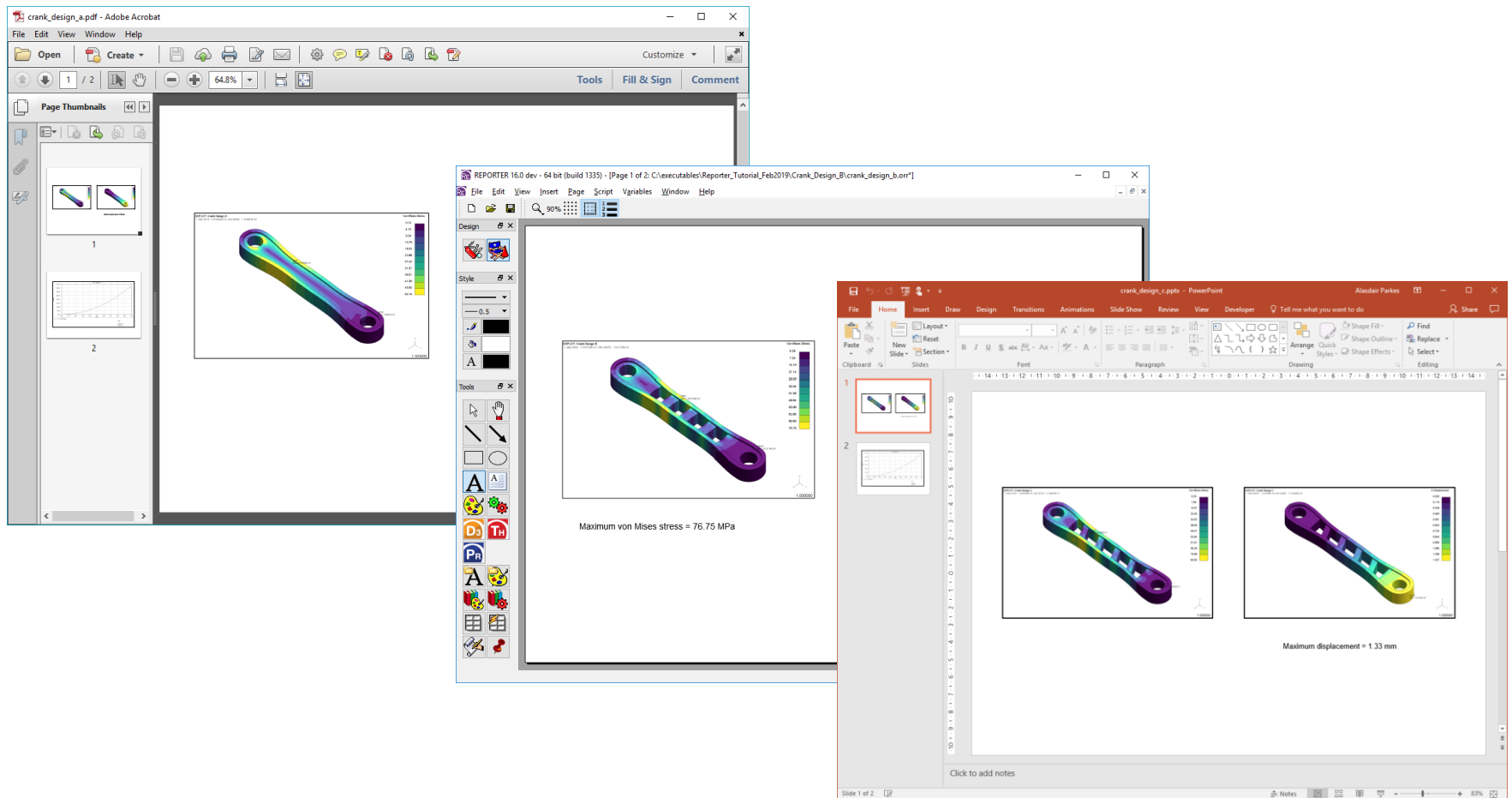
In this example, we will create a simple report for the analysis of a bicycle crank design.

In the LS-DYNA simulation, the crank is fully restrained at one end (the axle) and a 1000 N static load is applied at the other end (the pedal):





Simple example – REPORTER from SHELL

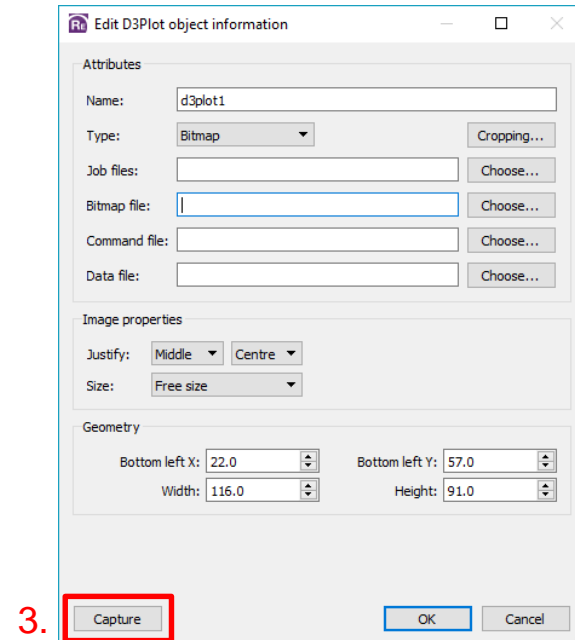
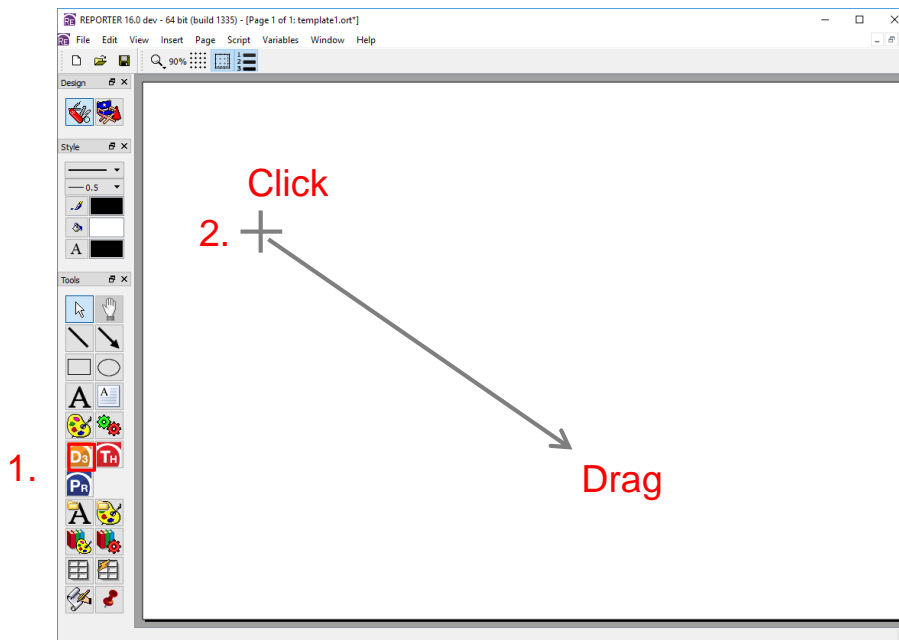
By the end of the example, we will have run the template on three different crank designs and we will have created reports in REPORTER, PDF and PowerPoint format.



D3PLOT image

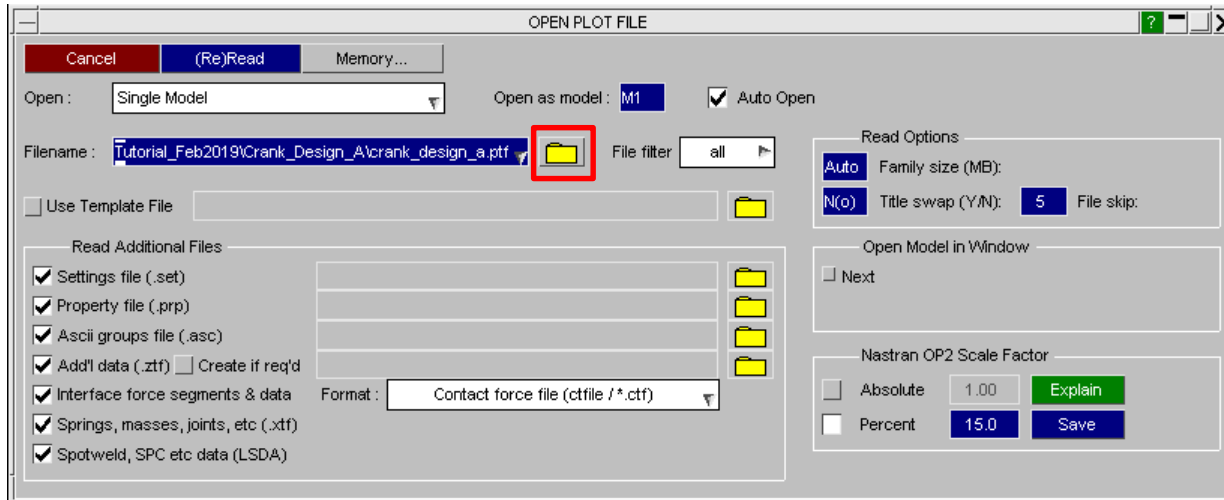
Simple example – D3PLOT image

- First, open a REPORTER session and create a new template: . By default, the pages are set up as portrait. To change to landscape, go to **File → Page Setup → Landscape → OK**.
- To add an image to the report showing stresses in the analysis model:
 - Click on the D3PLOT object button 
 - Click and drag on the report page to create a box that will contain the image.
 - In the D3PLOT object window that appears, click **Capture** and this will open a session of D3PLOT.



Simple example – D3PLOT image

- Inside the D3PLOT session, open the example model:
.../Reporter_Tutorial_Feb2019/Crank_Design_A/crank_design_a.ptf



- Choose the view, plot state and type of results to show. For example:

- Choose an ISO view **+ISO**:



- Go to last plot state:

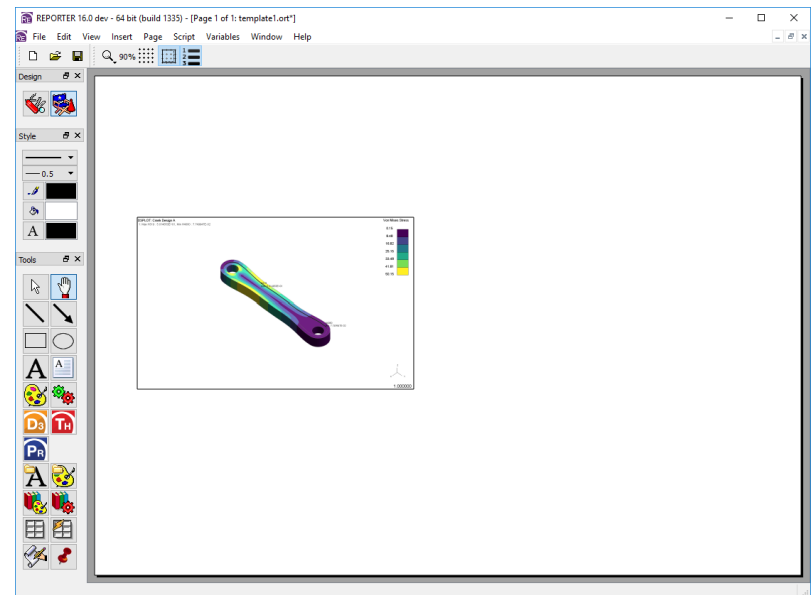
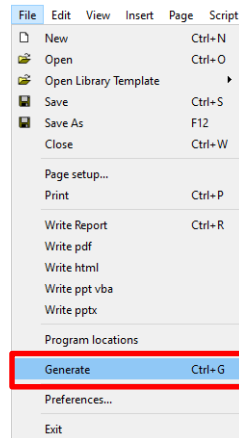
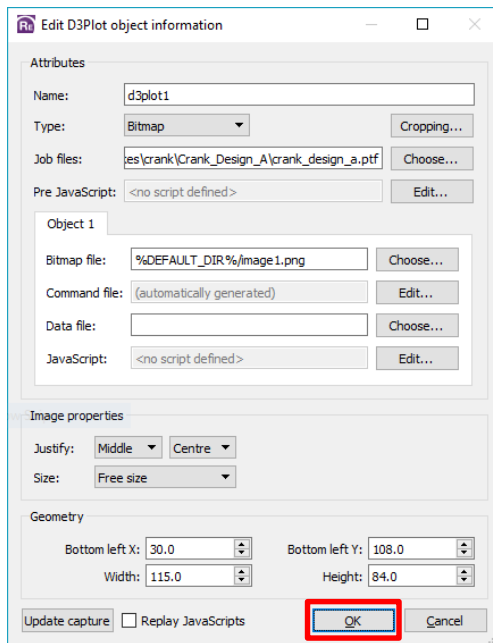


Simple example – D3PLOT image


- Once back into REPORTER, the Bitmap file and the Job file entries have been filled in, since D3PLOT has automatically created a settings file, a properties file and a command file and returned them to REPORTER. If you want to change the image, you can press **Update capture** again at any time. For now, accept the object by clicking **OK**.
- You can now look at the results, as they will appear in the final report, by generating the page:


Page → Generate page

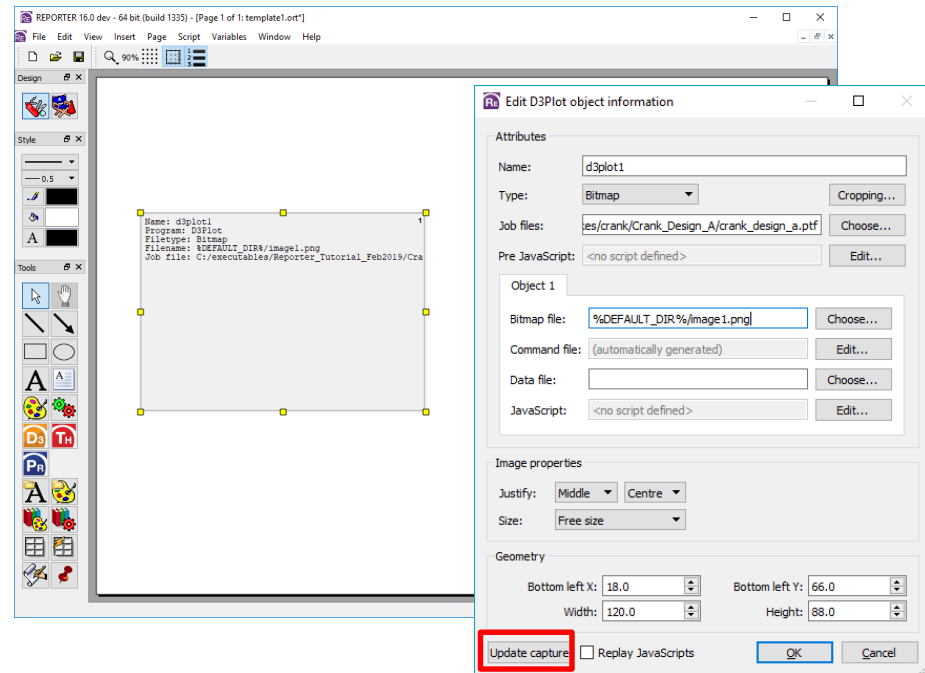
Or you can generate the whole report by selecting **File → Generate [Ctrl+G]**:



Simple example – D3PLOT image

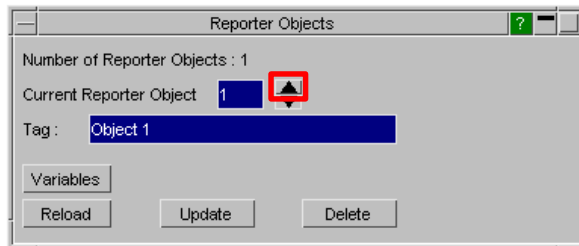
- Note that when the report was generated, the view was automatically switched from **Design** view to **Presentation** view. To continue working on the template, click on the **Design** view button: 
- To add a second picture on the same page, e.g. showing x-direction displacements, we could repeat the steps above for a new D3PLOT object. Alternatively, we could just copy and paste the existing D3PLOT object. However, there is a third, quicker way to generate multiple images from one D3PLOT object:

- Using the **Select** tool , double-click on the D3PLOT object or right-click → **Edit (Ctrl+E)** to edit it.
- Click **Update capture**

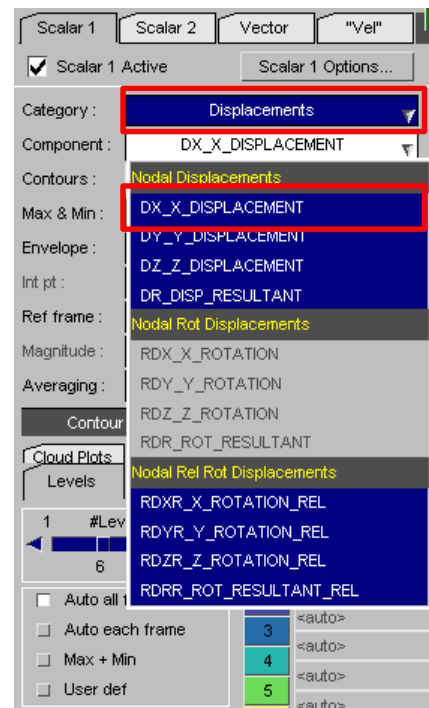


Simple example – D3PLOT image

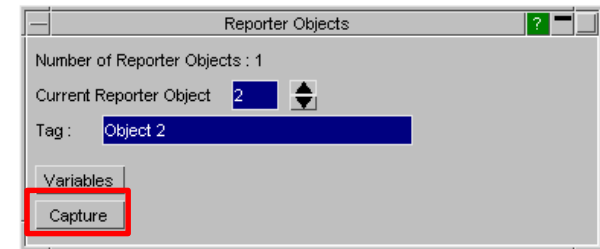
3. In D3PLOT, in the Reporter Objects window, click the up arrow to change the current Reporter Object to 2.



4. Plot x-displacements:



5. In the Reporter Objects window, click **Capture** to capture the new image:



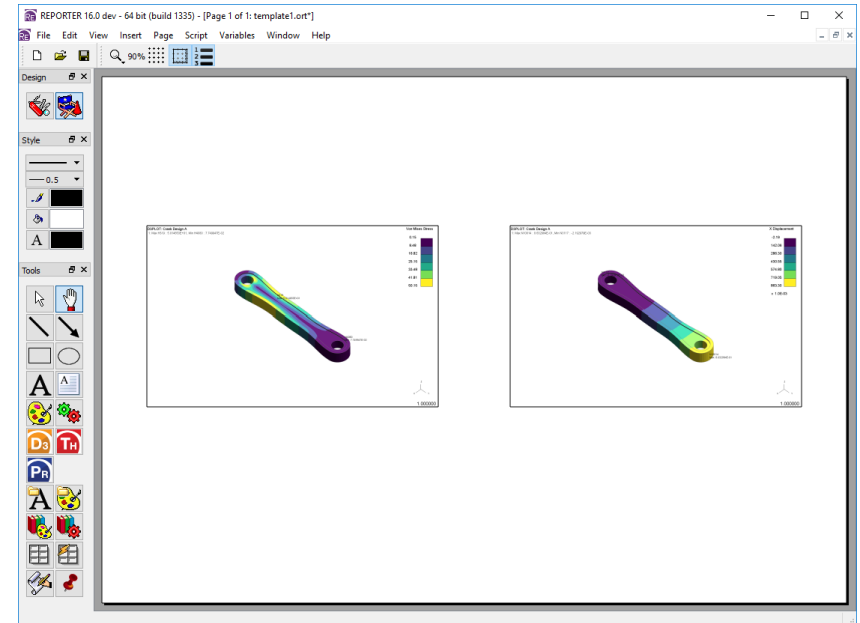
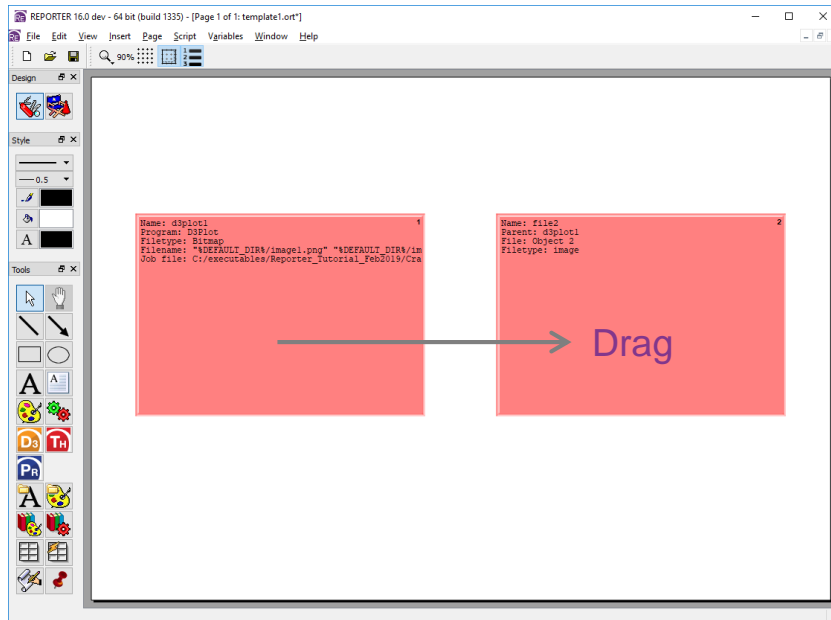
6. Return to REPORTER by selecting **File → => Reporter**

7. Click OK to accept the changes to the changes to the D3PLOT object.

Simple example – D3PLOT image



In **REPORTER** there are now two linked objects on the page. When generated, the parent object will display the first image and the child object will display the second. This method allows you to create many images from one **D3PLOT** object, which means **D3PLOT** only has to be launched once when the template is generated.

8. The two linked objects first appear superimposed. Move the child object into position alongside its parent.
9. Generate the template again (**Ctrl+G**) to show both images in **Presentation** view.



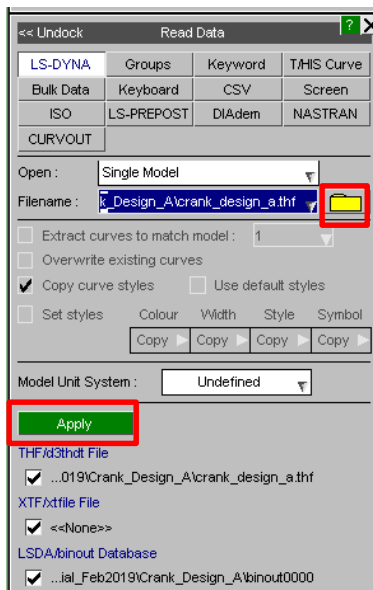
T/HIS image

Simple example – T/HIS image

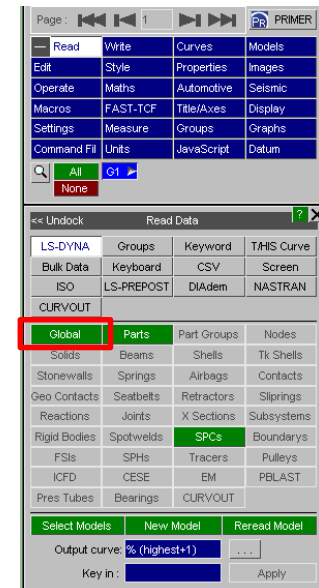
- We now want to create a second page for the time-history results.
Select **Page → New page... → OK**. The new page will become the current page.
- If you haven't already, switch back to **Design** view. 
- In the same way as for D3PLOT, to add a graph of energy curves from T/HIS, click on the T/HIS tool button  , then click and drag on the report page to create a box that will contain the image. In the window that appears, click **Capture** and this will open a session of T/HIS and generate a FAST-TCF script automatically.

1. Inside the T/HIS session, open the example model:
`.../Reporter_Tutorial_Feb2019/Crank_Design_A/crank_design_a.thf`

3. To plot the internal energy of the model, click **Global**:

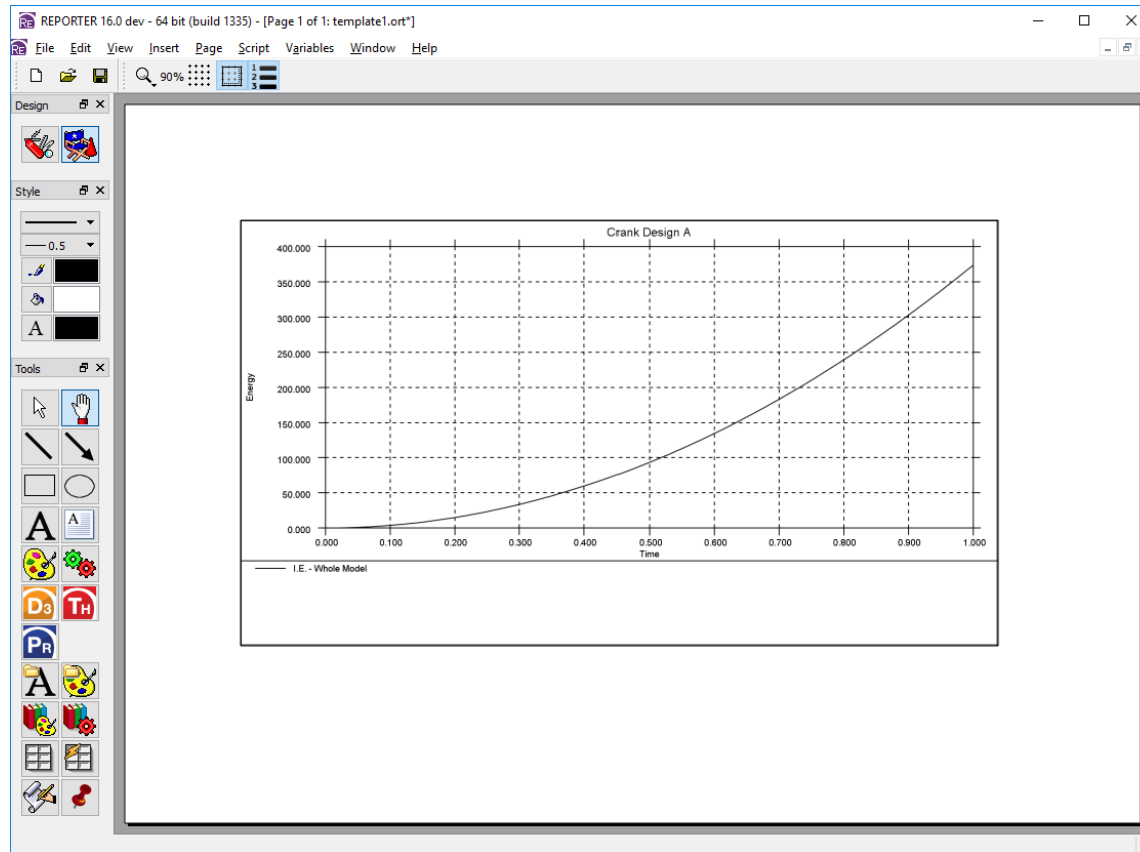


2. Click **Apply**:



Simple example – T/HIS image

- You can now look at the results by generating the page.
(Page → Generate page or File → Generate (Ctrl+G)):



Variables

Simple example – Variables

- A main feature of REPORTER is that it allows you to create a standard template for one specific model, and then use that template to automatically create a report for an entire set of models. This is mainly achieved using **variables**.
- Variables are defined with a name and a value, which can be a number or a text string, for example:

Variable name	Value
APPLIED_FORCE	1000.0
DEFAULT_DIR	<i>.../Reporter_Tutorial_Feb2019/Crank_Design_A</i>
DEFAULT_JOB	<i>crank_design_a</i>

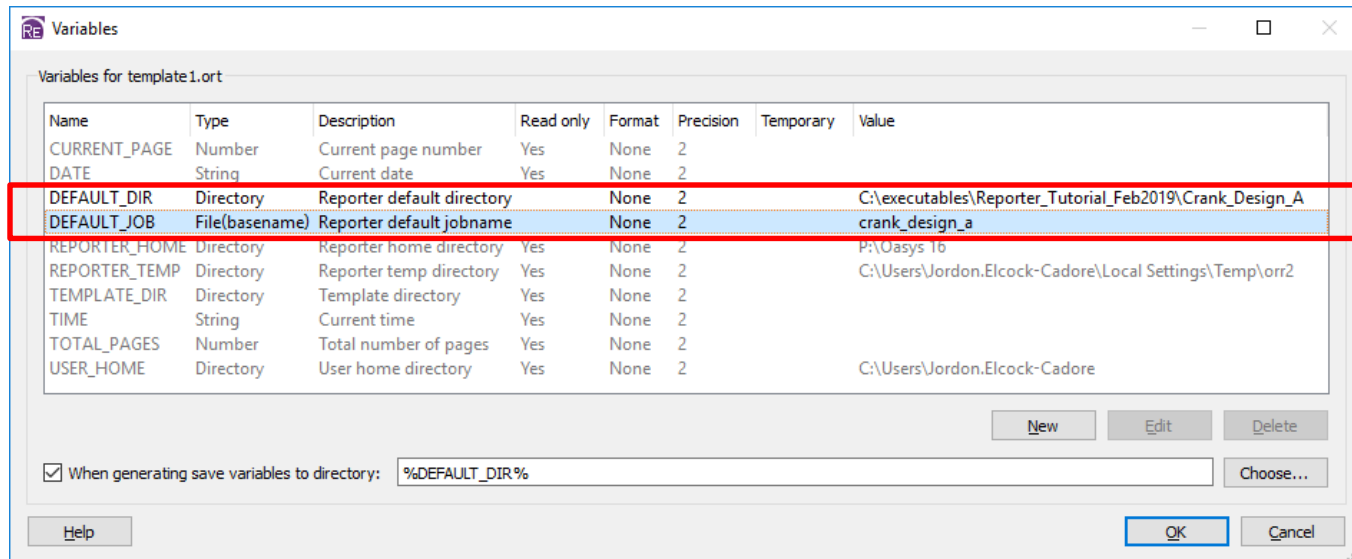
- When variables are written in the template itself, they must be enclosed by % signs e.g. **%DEFAULT_DIR%**.
- The main advantage of using variables is that, rather than having to go through the report and change all the various filenames and directory paths when you want to generate a report from a new model, all you need to do is change the variables.
- Editing variables can be done manually in REPORTER or automatically as part of the batch process run from Oasys SHELL (explained later).

Simple example – Variables

- Select **Variables** → **Edit...** to open the variable table.
- Variables **DEFAULT_DIR** and **DEFAULT_JOB** are in the list of standard variables that appear in every REPORTER template. Edit them to have values as follows:

Variable name	Value
DEFAULT_DIR	<Full path on your computer>/Reporter_Tutorial_Feb2019/Crank_Design_A
DEFAULT_JOB	crank_design_a

- Note that **DEFAULT_JOB** should contain the filename without its extension, so that the same variable can be used for both D3PLOT and T/HIS objects (%DEFAULT_JOB%.ptf and %DEFAULT_JOB%.thf).

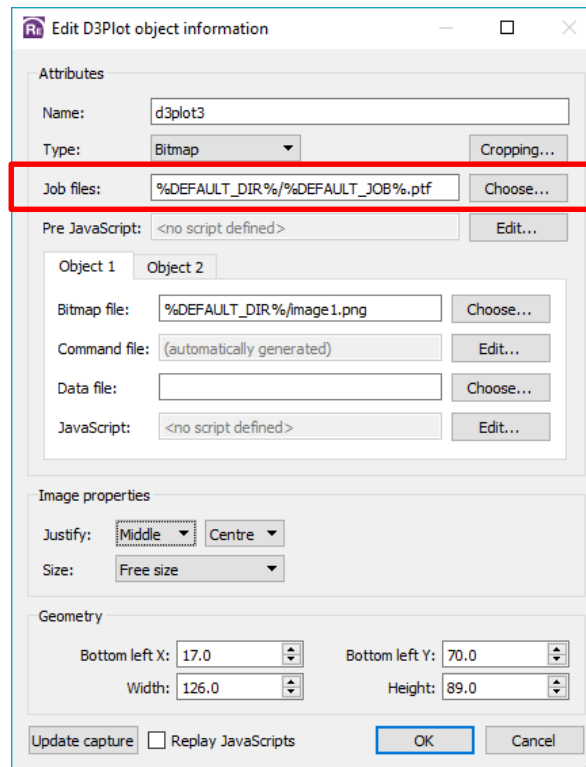


Simple example – Variables

The example template we have built so far contains a D3PLOT object on page 1 and a T/HIS object on page 2.

We now need to edit both objects so that they make use of the variables we have defined.

1. Edit the D3PLOT object. Change **Job files** to **%DEFAULT_DIR%/ %DEFAULT_JOB%.ptf** (or **%DEFAULT_DIR%/d3plot** depending on LS-DYNA output binary file names).



Simple example – Variables

2. Similarly, edit the T/HIS object. Change Job file to `%DEFAULT_DIR%/ %DEFAULT_JOB%.thf` (or `%DEFAULT_DIR%/d3thf`).

Attributes

Name:

Type:

Output:

Bitmap file:

Job file:

FAST-TCF script

```
# Built in variables:
# =====
# $ftcf_script: Name of the FAST-TCF that is being run.
# $ftcf_script_dir: Name of the FAST-TCF directory.
# $ftcf_dir: Name of the current working directory.
# $ftcf_path: Full pathname of the current working directory.
# $ftcf_startin_dir: Directory T/HIS was started from.
#
# $run_name: Basename of the key file for the first model.
# $run_dir: Full pathname of output file directory.
# $run_title: Title of the analysis found in the output files.
#
# If a script refers to multiple models then, $run_nameN,
```

Image properties

Justify:

Size:

Geometry

Bottom left X: Bottom left Y:

Width: Height:

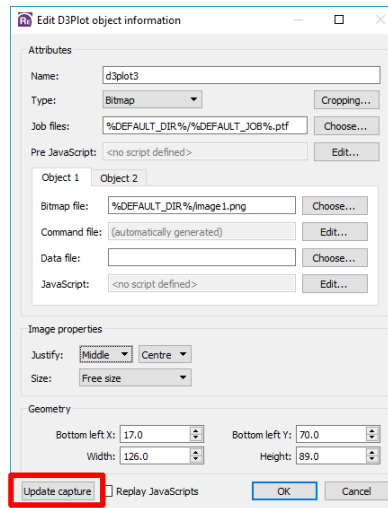
Simple example – Variables

You can now generate the report again (**File → Generate (Ctrl+G)**) and the images should be generated as before, except that this time, the D3PLOT and T/HIS objects determined the results files locations from the DEFAULT_DIR and DEFAULT_JOB variable values.

Another benefit of variables is that it allows us to retrieve important values from D3PLOT and T/HIS and return them to REPORTER so that we can present them in our report.

We can demonstrate this by retrieving the maximum von Mises stress from the D3PLOT object:

1. Edit the D3PLOT object and click **Update Capture**.

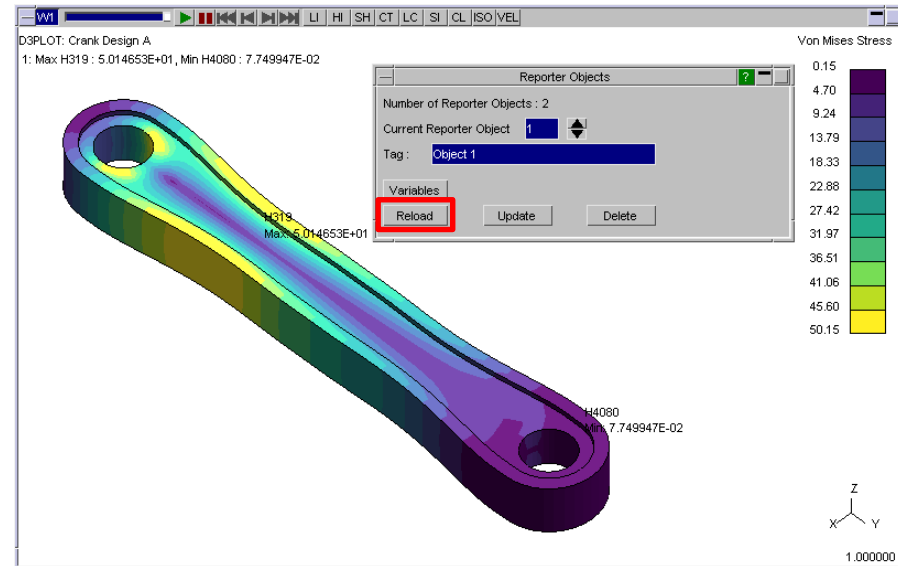
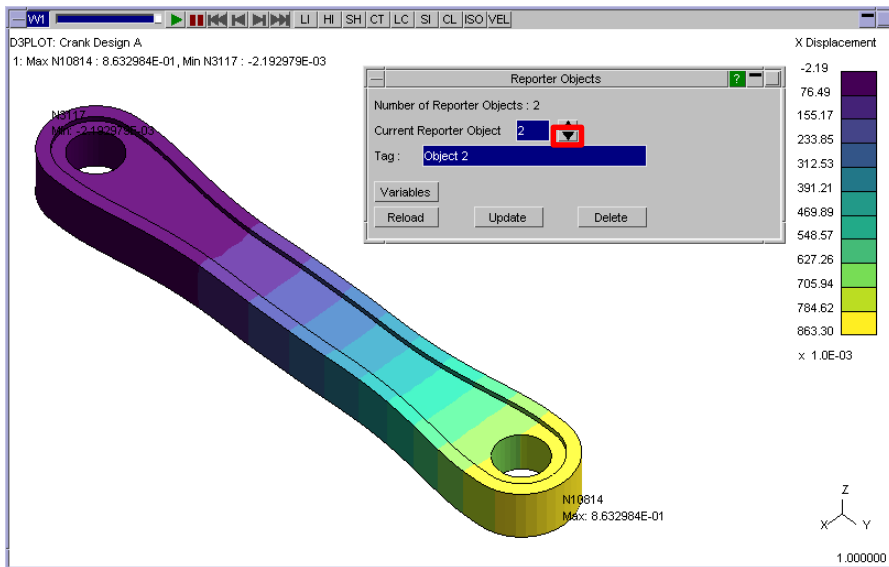


Simple example – Variables

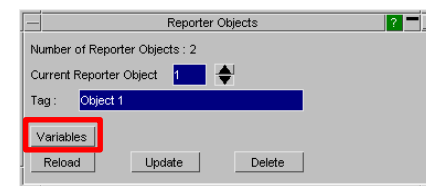
2. Inside the D3PLOT session, the **Current Reporter Object** is Object 2 (the final object is always displayed – in this case, showing x-displacements).

Click the **down arrow** to switch to Object 1.

3. Click **Reload** to apply all of the settings associated with Object 1. You will notice that von Mises stress is now plotted instead of x-displacements.

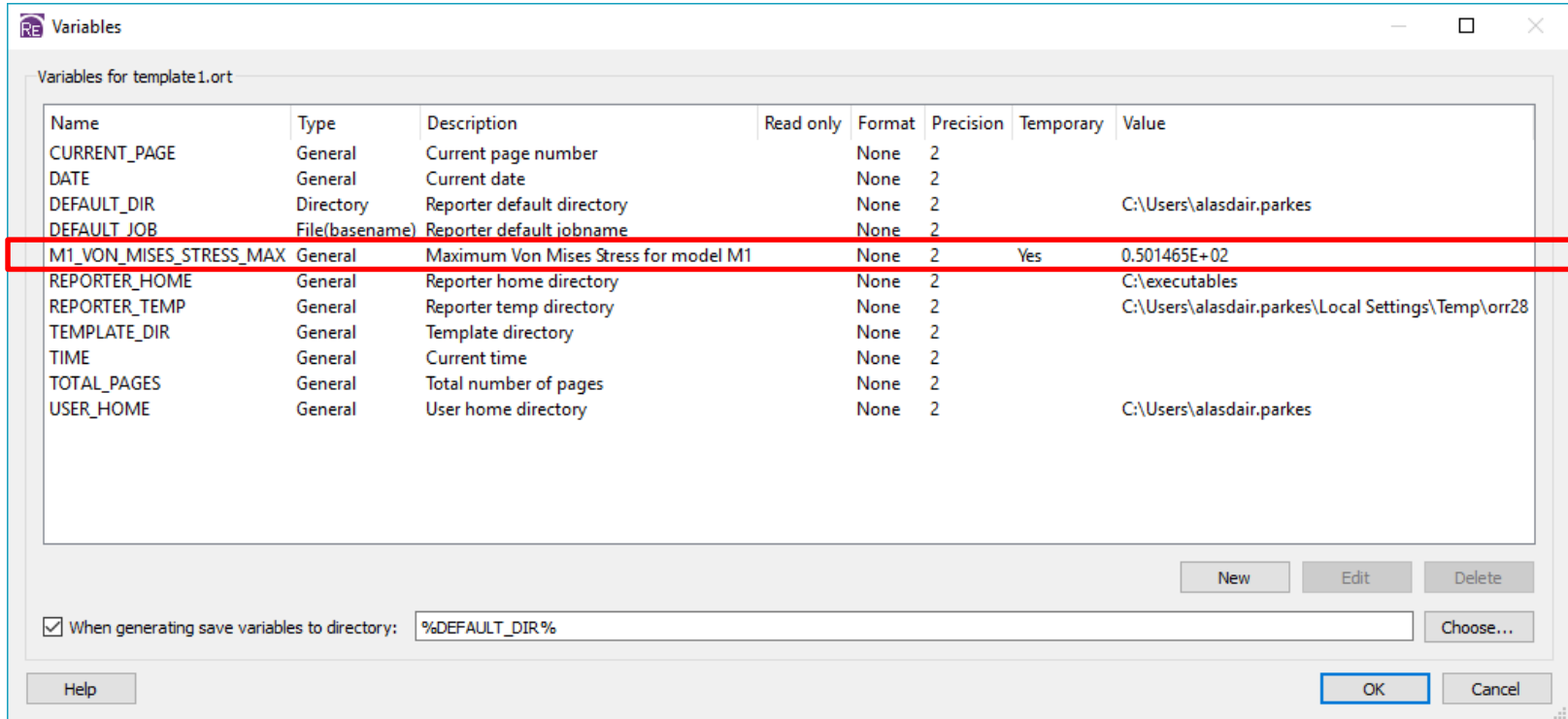


4. Now click **Variables** to access the Reporter Variables window for Object 1.



Simple example – Variables

Back in REPORTER, if we now generate the page containing the D3PLOT object (Page → Generate page), a new variable M1_VON_MISES_STRESS_MAX will be created.



We can use this variable to give the D3PLOT image a caption.



Text objects

Simple example – Text objects

- In order to insert a text object to report the maximum von Mises stress:

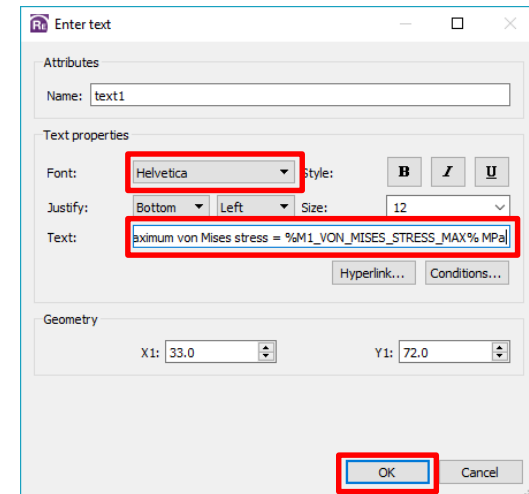
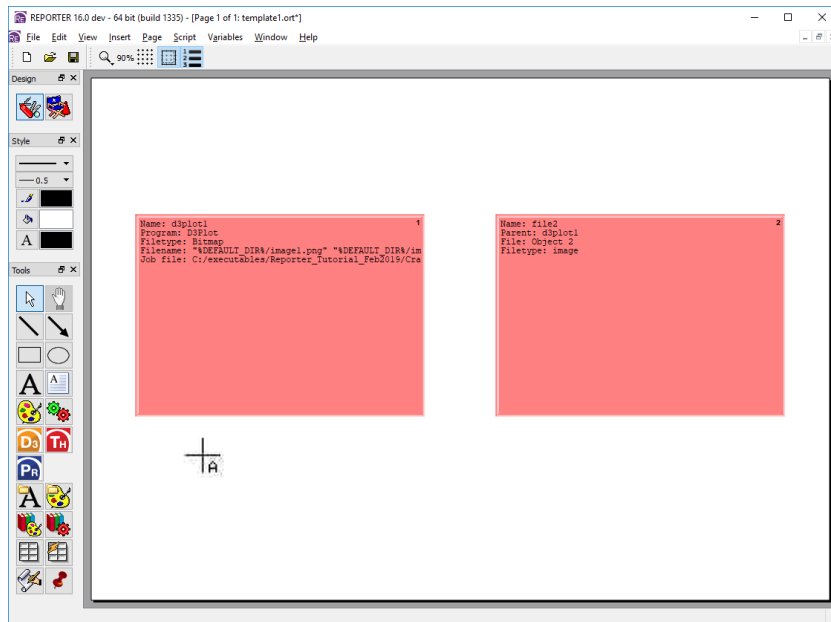
1. Click on the Text item button . A text cursor will appear .

2. Click on the page where you want the start of the text to appear.

3. In the text window, set the font to **Helvetica**. Enter the following text:

Maximum von Mises stress = %M1_VON_MISES_STRESS_MAX% MPa


Click **OK** to create the text object.

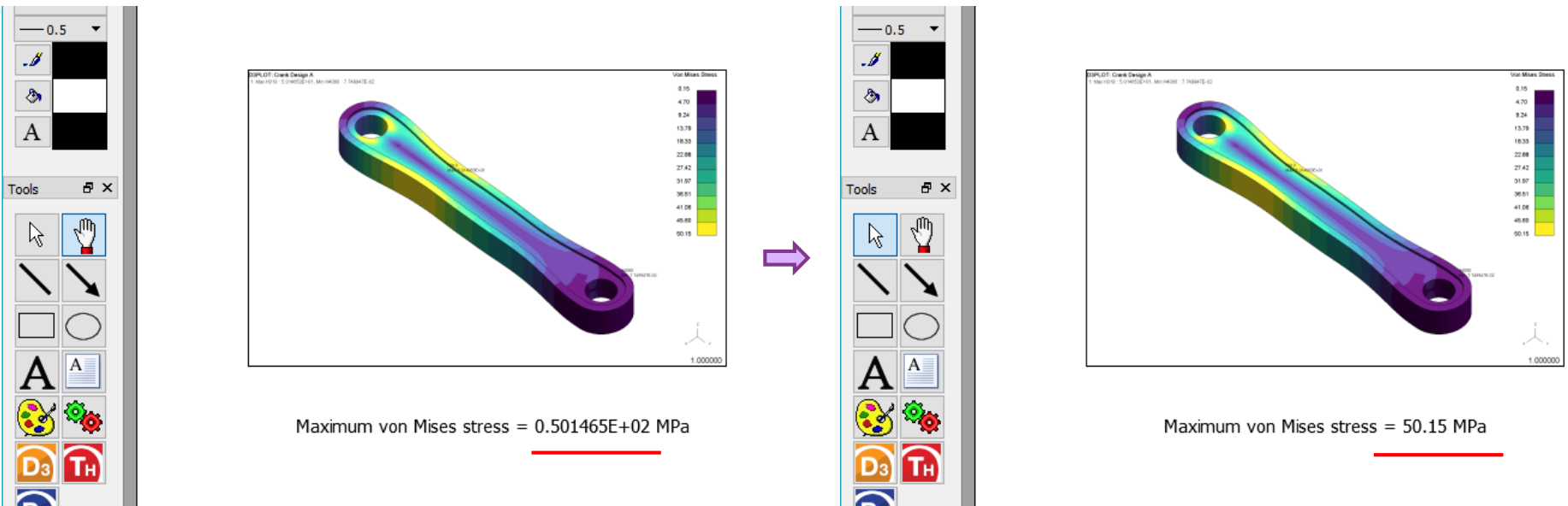


Simple example – Text objects

In **Presentation** view, the text will now appear with the von Mises stress value shown in place of the variable name.

By default, the stress value will be written in scientific notation. To change it into a more readable format, we can add a formatting string to the variable:

1. With the **Select** tool , double-click on the text object to edit it again.
2. For a floating point number with two decimal places, add **(2f)** after the variable name, inside the % flags: **%M1_VON_MISES_STRESS(2f)%**

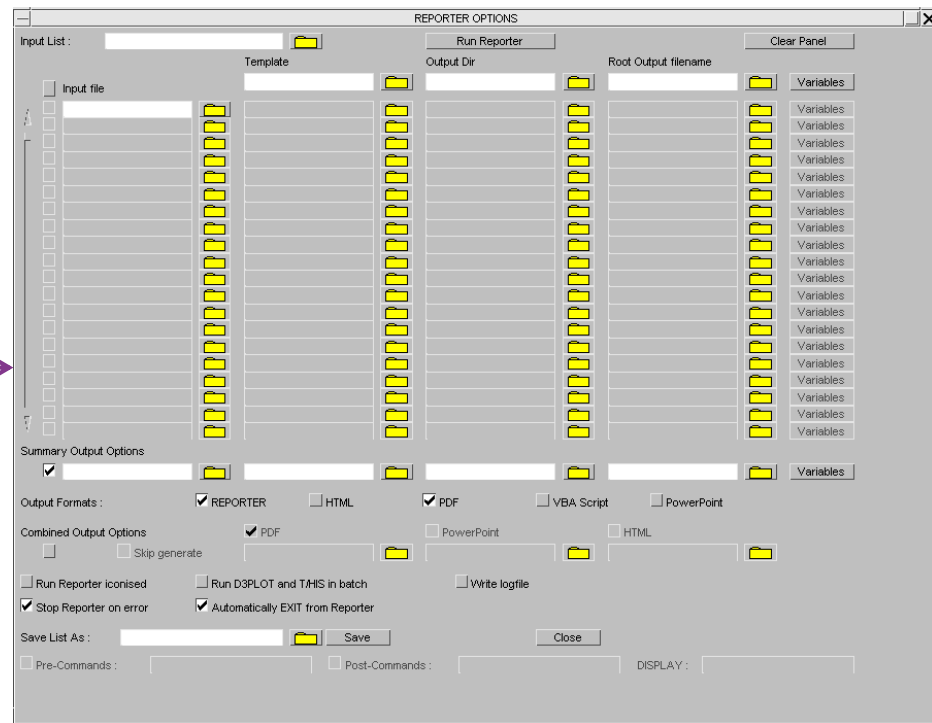
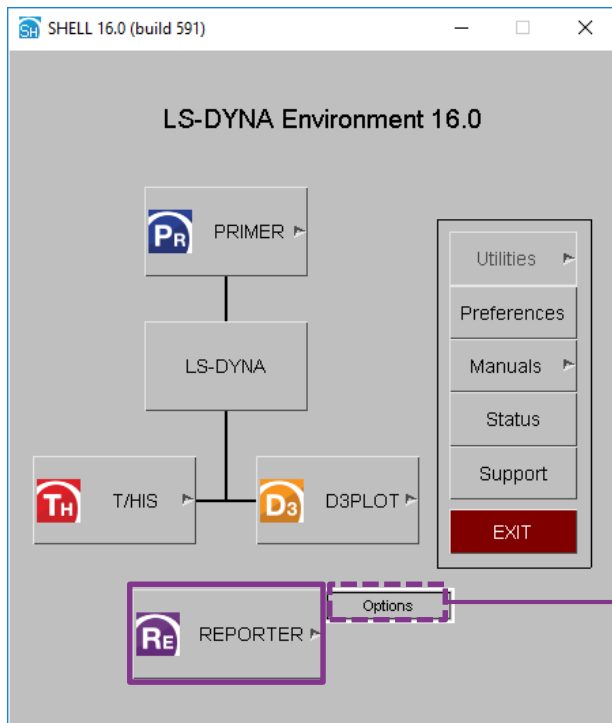


REPORTER for multiple models (from SHELL)

Simple example – REPORTER from SHELL

Now that we have created a template that uses variables, we can generate the same template for several LS-DYNA models.

1. Save the template (File → Save (Ctrl+S)) as `crank_design.ort`.
2. Close REPORTER (File → Exit).
3. Start Oasys SHELL. Right-click REPORTER → Options to open the Reporter Options window.



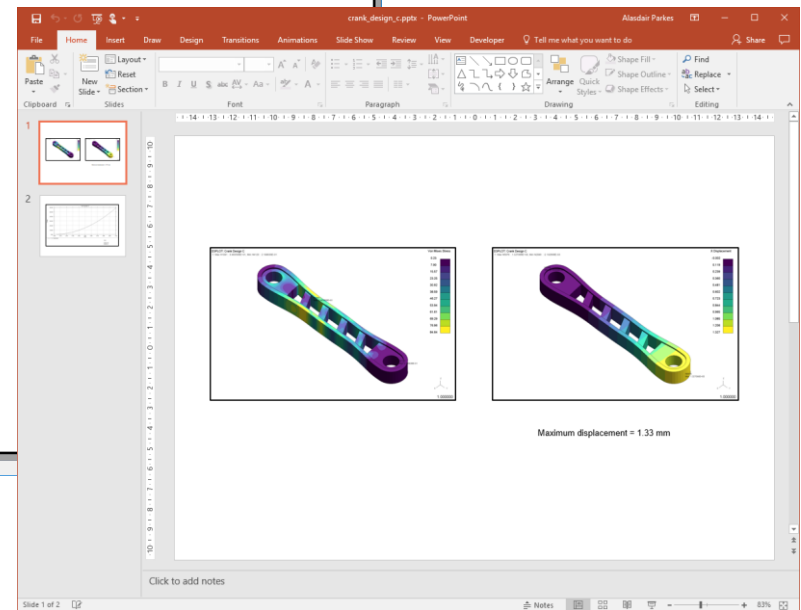
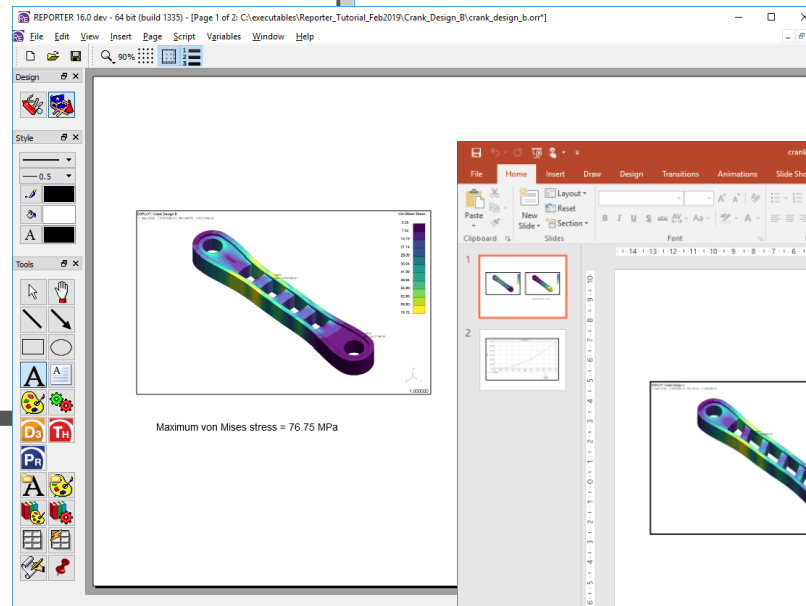
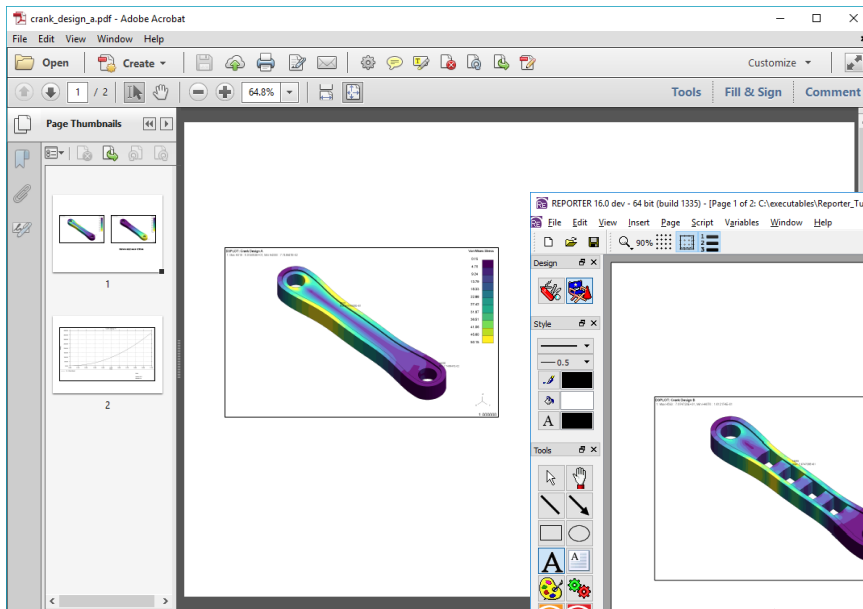
Simple example – REPORTER from SHELL

4. Select each of the keyword files for the three designs:
Crank_Design_A/crank_design_a.key
Crank_Design_B/crank_design_b.key
Crank_Design_C/crank_design_c.key
Make sure that all of the models are selected ☒.
5. Select the saved template **crank_design.ort** for all of the files. Default output directories and filenames are generated automatically.
6. Select the desired output formats (REPORTER, PDF, PowerPoint).
7. Click **Run Reporter**.
A command line window will appear as REPORTER is run in batch and the template is generated automatically for each of the models in the list, creating the output in the formats selected.



Simple example – REPORTER from SHELL

The REPORTER, PDF and PowerPoint versions of the report can now be found in each of the model folders.



- ☐ Name
- adptmp
- appfile
- bg_switch
- binout0000
- crank_design_a.ctl
- crank_design_a.err
- crank_design_a.key
- crank_design_a.log
- crank_design_a.orr**
- crank_design_a.otf
- crank_design_a.pdf**
- crank_design_a.pptx**
- crank_design_a.ptf
- crank_design_a.ptf01



www.arup.com/dyna

For more information please contact the following:

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