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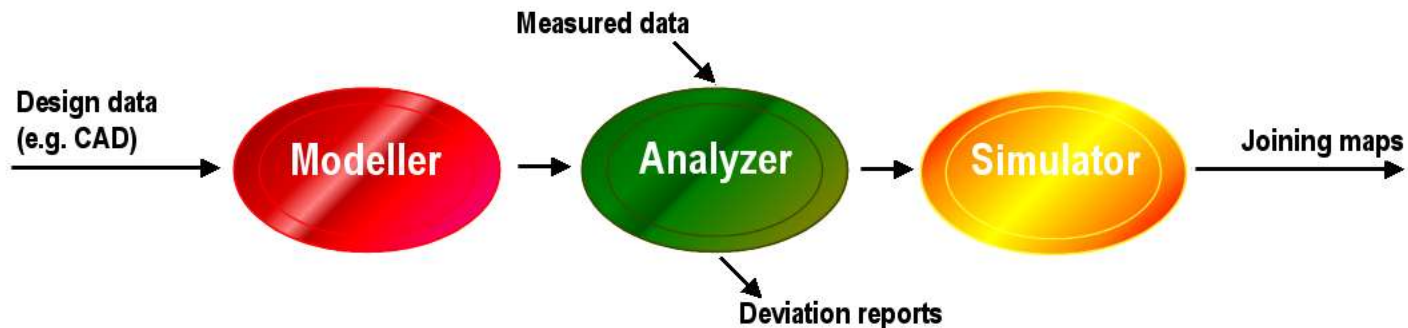




What is DCP100 ?

DCP100 is...

- ... most advanced software developed especially for ship production.
- ... used for dimensional analysis and alignment control of steel structures.
- ... used to compare measured as-built ship assembly with the design model.
- ... used to simulate the alignment and the joining of two ship structures.





Why to implement DCP100 ?

By adopting DCP100...

- ... remarkable amount of man-hours is saved in the preparation work. DCP100 is able to read in CAD data and to create a reference **model** of a ship structure with minimal manual intervention.
- ... manufacturing accuracy of the assembling stages is improved. DCP100 is an excellent tool for quick and comprehensive **analyses** of the actual-design deviations.
- ... significant savings are achieved by avoiding unnecessary adjustment and rebuild production work in critical assembling stages. DCP100 enables the computer **simulation** of the alignment and the joining of two ship structures.

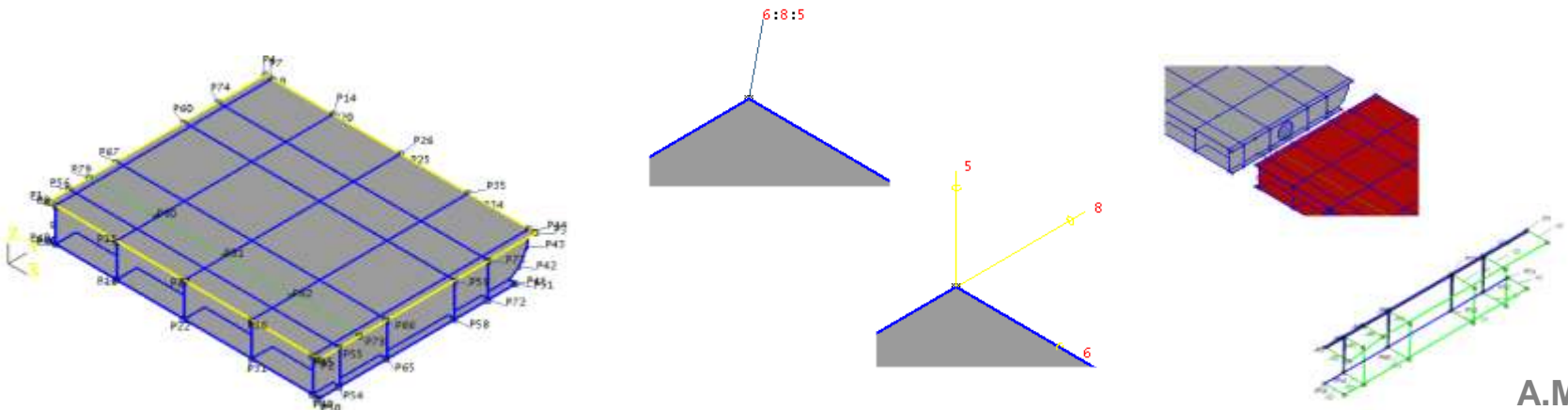




Why to select DCP100 ?

By purchasing DCP100 you will...

- ... accept modern network software. The operation license is not PC-workstation dependent.
- ... receive advanced graphical software. 3D graphical objects are activated by mouse click. Various menus and displays are immediately at user's disposal.
- ... get three separate software modules: **Modeller** for preparation work, **Analyzer** for observing dimensional distortions and **Simulator** for viewing joining structures. In addition there is **Viewer** module for 3D viewing of results.

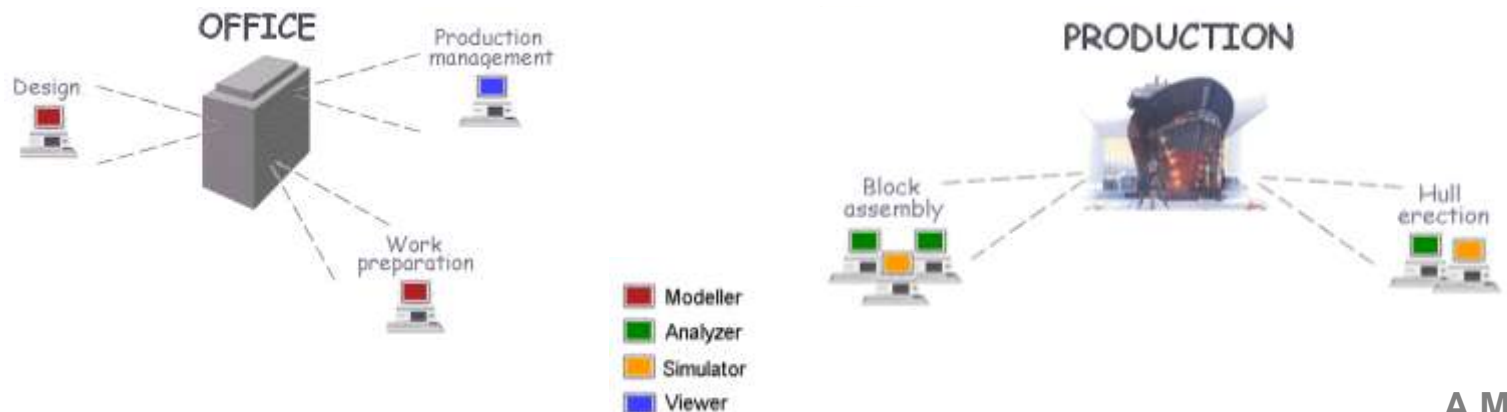




How DCP100 modules are realized?

Each of module is...

- ... an independent software. It can be run in a stand alone PC or you can purchase a network license. The network license will give you a full usage flexibility not being restricted to a specific computer.
- ... a graphical software package containing state of art 3D interactive graphics and a set of specific user friendly menus.
- ... a modern Windows application. Various forms of data files are accepted as well as different printouts are available depending on the software module.

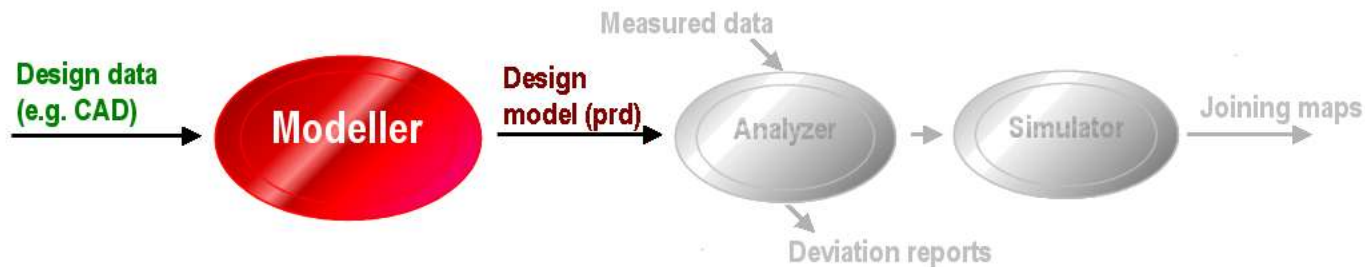




What is DCP100 Modeller ?

Modeller is...

- ... a specific software which imports directly a CAD file (different formats available, see more details on slide 27) and exports a reference model (prd format). The actual production data is compared to this design model.
- ... an intelligent model builder which creates the graphical model automatically, with minimal user intervention. This reference model comprises objects which are essential for the dimensional control purposes.
- ... a CAD tool itself, which can be used to build interactively the design model. In addition the model can be edited, graphical objects added to it or removed from it.

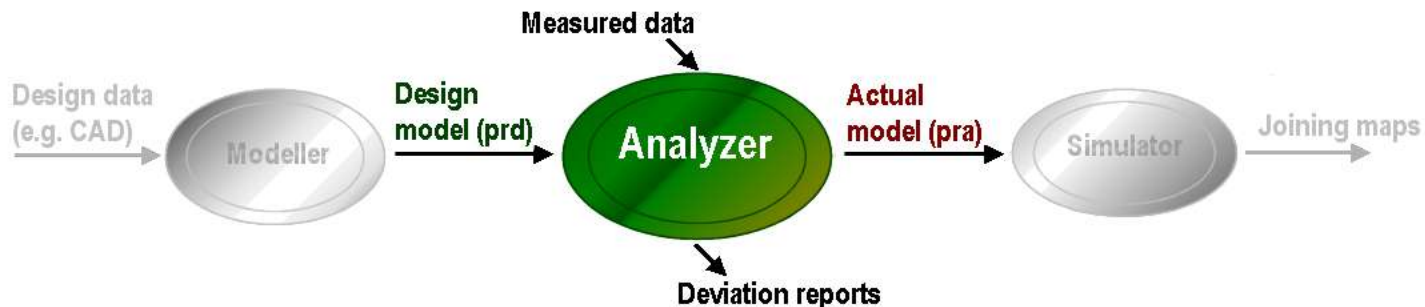




What is DCP100 Analyzer ?

Analyzer is...

- ... specific software which compares the actual ship structure to the design reference model. The deviations are illustrated graphically on the display.
- ... a graphical tool which is used to evaluate the actual distortions. Fast and user friendly methods are available for alignment control and for dimensional calculations.
- ... a excellent dimensional control reporter. Complete graphical and numerical reports are easy and fast to create and to deliver.

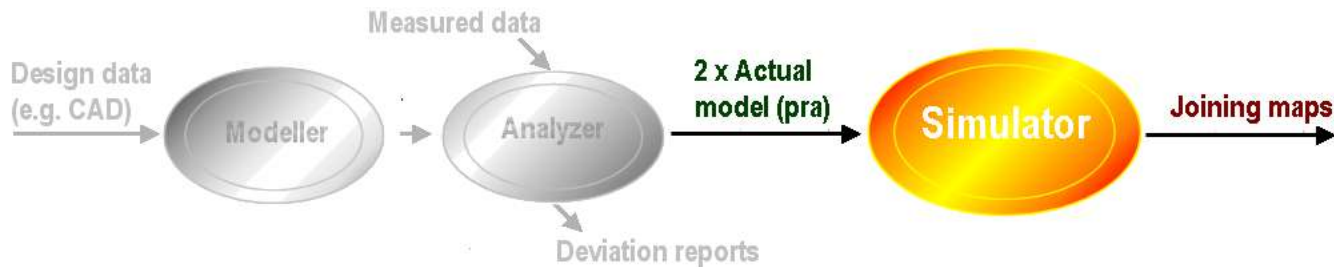




What is DCP100 Simulator ?

Simulator is...

- ... purpose-built software for simulating the alignment and the joining of two adjacent ship structures. The results of the fitting are illustrated graphically on the display.
- ... an excellent graphical program to visualize the actual distortions of the joining faces. Proper alignment methods are at user's disposal to efficiently achieve the best possible merging of the units.
- ... production tool to guide the assembling work. Specific graphical and numerical joining maps are available to illustrate the welding gap and the burning map in the case of excess material.

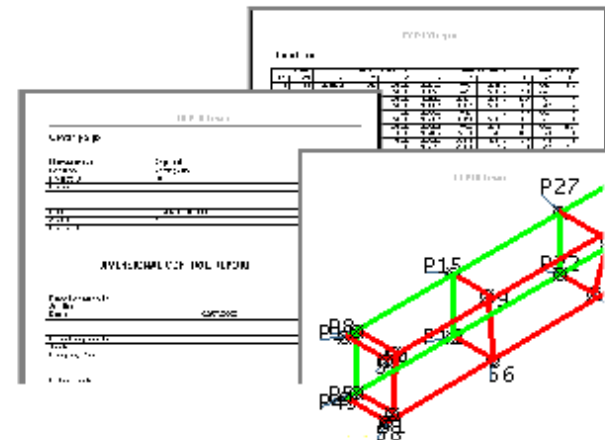
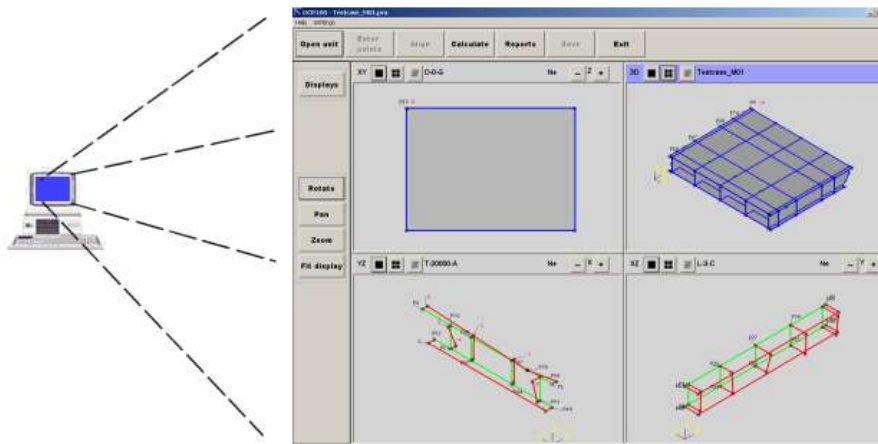




What is DCP100 Viewer ?

Viewer is...

- ... a graphical tool which reads in the actual-design data produced by Analyzer.
- ... used for displaying and viewing actual-design deviations.
- ... also used to print out the MS Word deviation reports.





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More about ...

In the next slides a bit more technical descriptions of DCP100 are presented. Contents of this section is as follows:

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More about Modeller

The Modeller module is used to build up a unit or extend and update already existing unit.

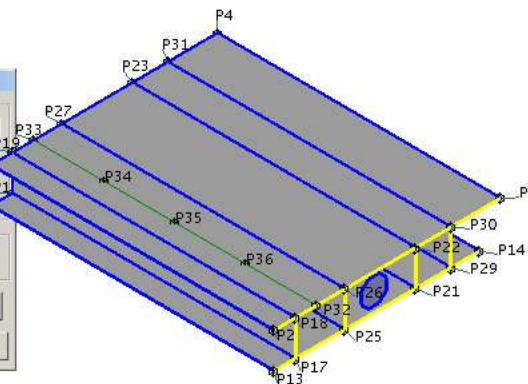
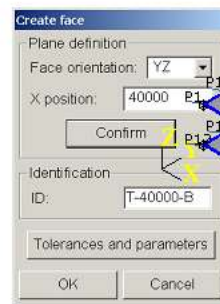
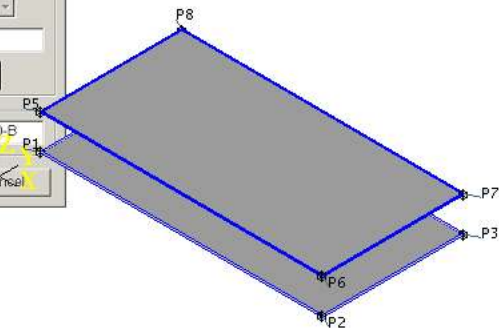
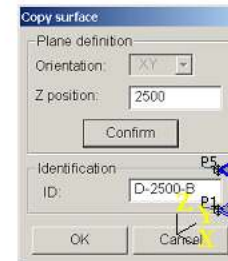
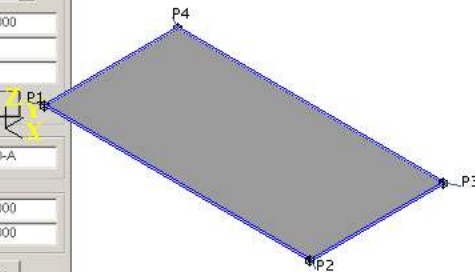
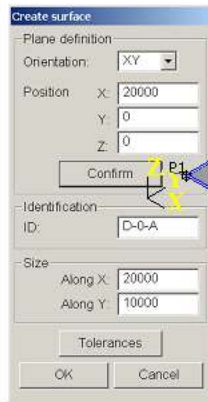
- The model of a new unit can be built up from **scratch** using a set of create and edit type of commands.
- User may import a file which contains a **list of points** to be measured with the design coordinate values. Modeller creates automatically the unit structure based on these design coordinate values.
- User may also **import a CAD-file** which is created by the yard's CAD/CAM system to be converted into the format of this program, the prd format.
- In addition a previously defined unit may be opened to be updated or extended.
- When the user is satisfied with the model of the unit he can save it and then import it to Analyzer module.



Unit build up from...

Scratch

- The model of a new unit can be built up from scratch using a set of create and edit type of commands. The design data is then extracted manually from the existing drawings.






Unit build up from...

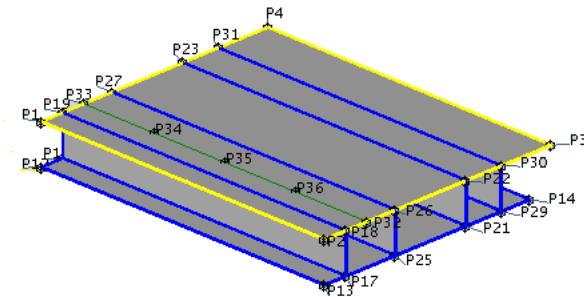
List of points

- User may also import a file which contains a list of points to be measured with the design coordinate values.
- Modeller creates automatically the unit structure based on these design coordinate values.



P1	20000.0	3.0	2500.0
P2	40000.0	3.0	2500.0
P3	40000.0	16003.0	2500.0
P4	20000.0	16003.0	2500.0
P12	20000.0	3.0	0.0
P13	40000.0	3.0	0.0
P14	40000.0	14503.0	0.0
P15	20000.0	14503.0	0.0
P16	20000.0	1500.0	0.0
P17	40000.0	1500.0	0.0
P18	40000.0	1500.0	2500.0
P19	20000.0	1500.0	2500.0
P20	20000.0	10000.0	0.0
P21	40000.0	10000.0	0.0
...			

Point list file

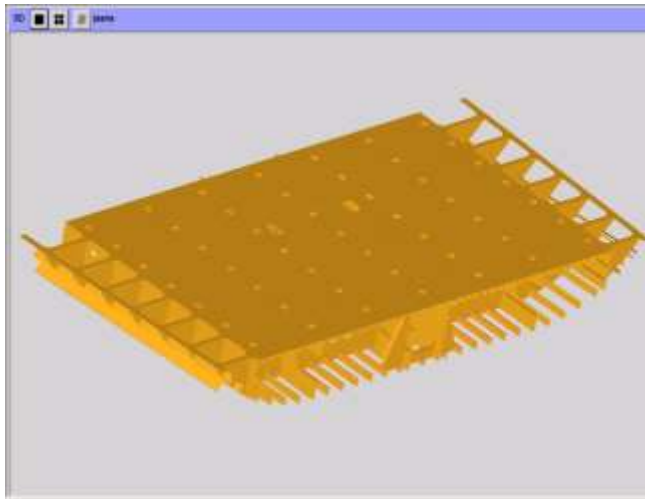




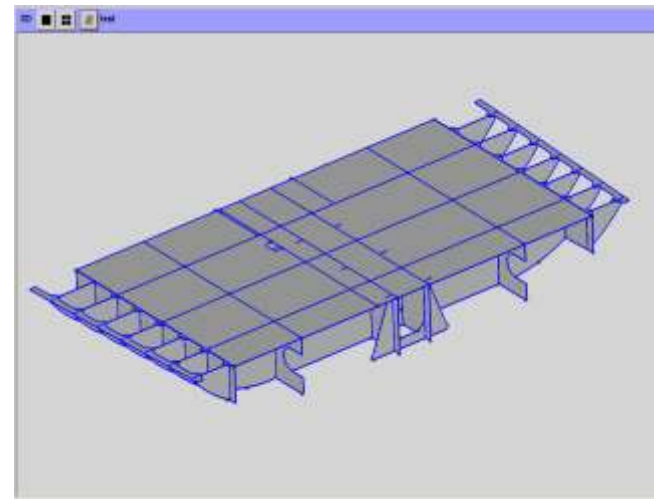
Unit build up from...

CAD file

- User may open a CAD file to be converted into the format of this program, the prd format.
- Software automatically simplifies the model to fit perfectly for dimensional control purposes.
- The user completes the model and saves it as prd type of file.



Unit displayed in DXF format.



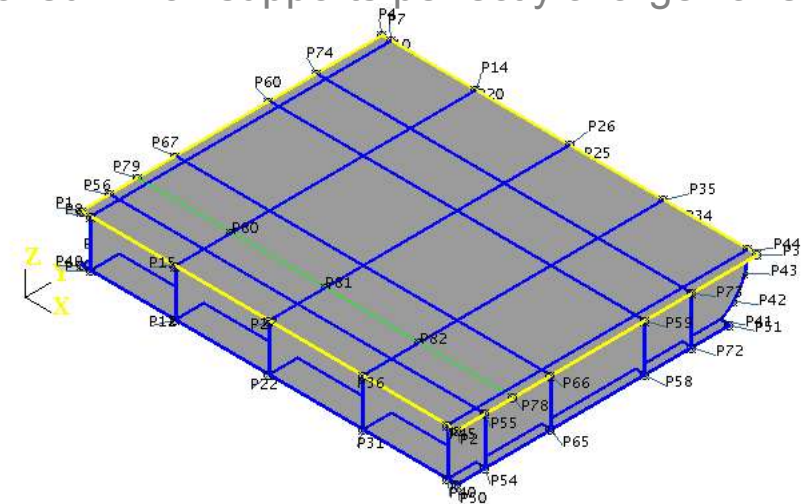
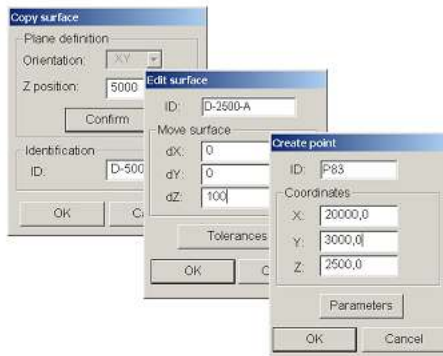
Unit automatically translated to PRD format and then displayed.



Why DCP100 Modeller ?

By using the Modeller...

- ... remarkable amount of man-hours is saved and the productivity improved in the preparation work. The preparation task is done efficiently with this modern tool.
- ... the user can take full advantages of the complete reference model which is specifically developed for dimensional control purposes. Besides the graphical objects the model contains also specific items such as faces and joints.
- ... a state of art solution is reached which supports perfectly a large variety of shipyard requirements.





More about Analyzer

With the Analyzer module the dimensional accuracy of a unit is studied.

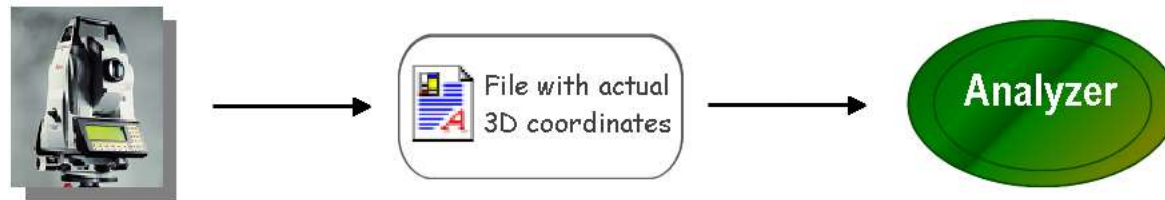
- The actual coordinate values from the measured points are read from a file or entered manually.
- The dimensional distortions are presented graphically and numerically.
- Analyzer offers the align control functionality for adjusting the deviations.
- Complete tolerance control allows to show the exceeding values with red numbers.
- The verification of critical scalar distances is easily calculated with specific menus.
- MS Word reports are available for delivery or to be shown on the screen and to be printed out.



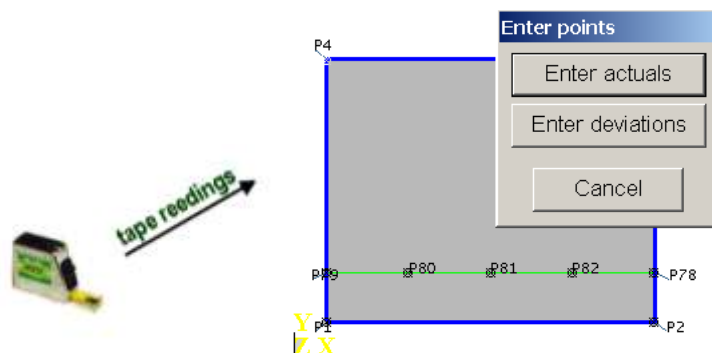
Entering actual values

The actual coordinate values from the measured points (x, y, z) can be read from the file or entered manually.

From file:



Manually:



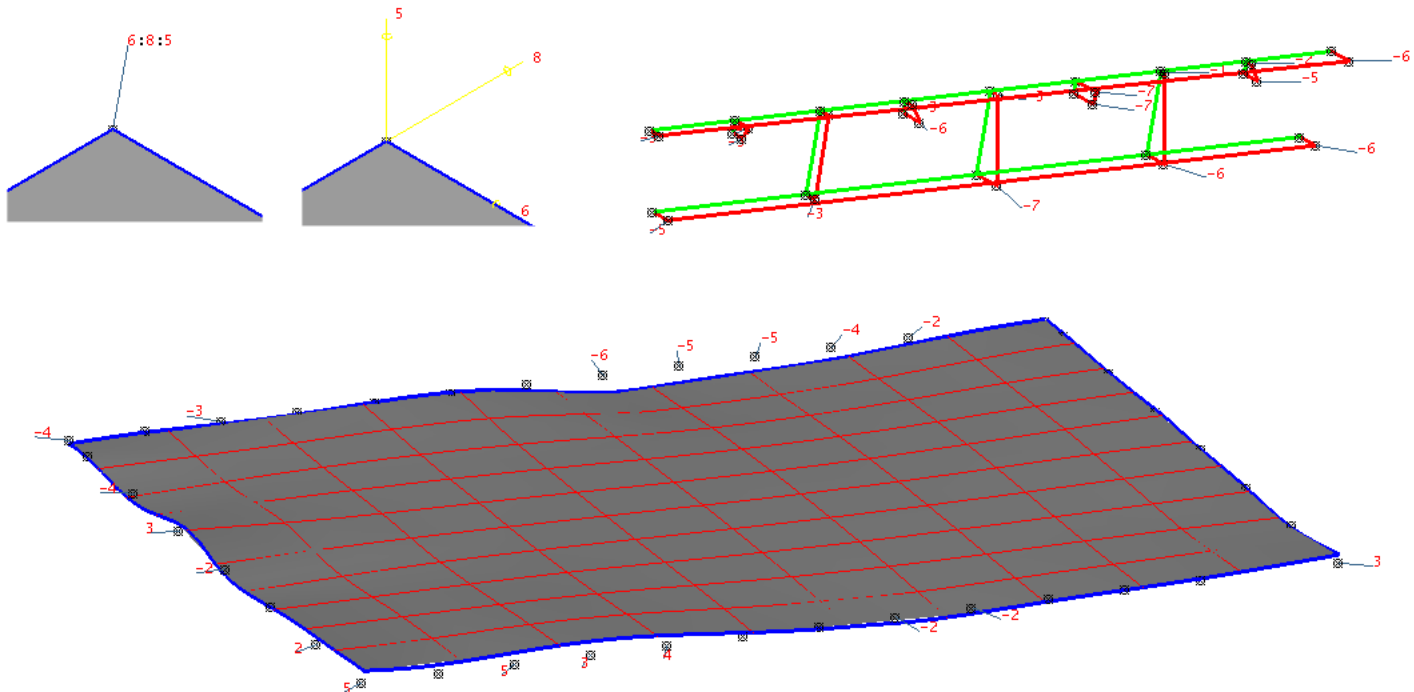
Enter actuals			
Pid:	P4		
Dev of interest:	xyz		
	Dsg	Actual	Dev
X:	20000,0	20001,9	1,9
Y:	16003,0	16000,1	-2,9
Z:	2500,0	2504,2	4,2
Previous		Next	Clear
Continue		Cancel	



Deviations

The dimensional distortions are presented as point deviations, straightness of edges, flatness of surfaces etc.

- User can select suitable deviation presentations from a specific appearance dialog. Tolerance exceeding is shown with red number.

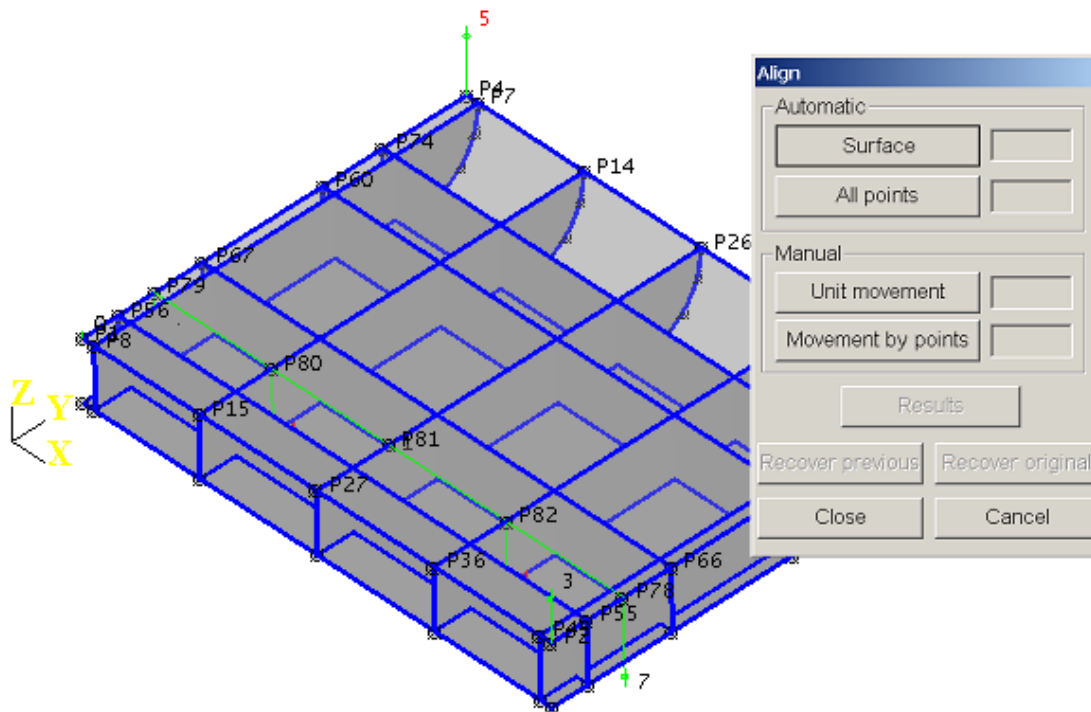




Aligning

The align means that the actual unit is moved and rotated relative to the design values.

- The program supports several alignment methods. The results of the alignment are observed from deviations or from special dialogs.

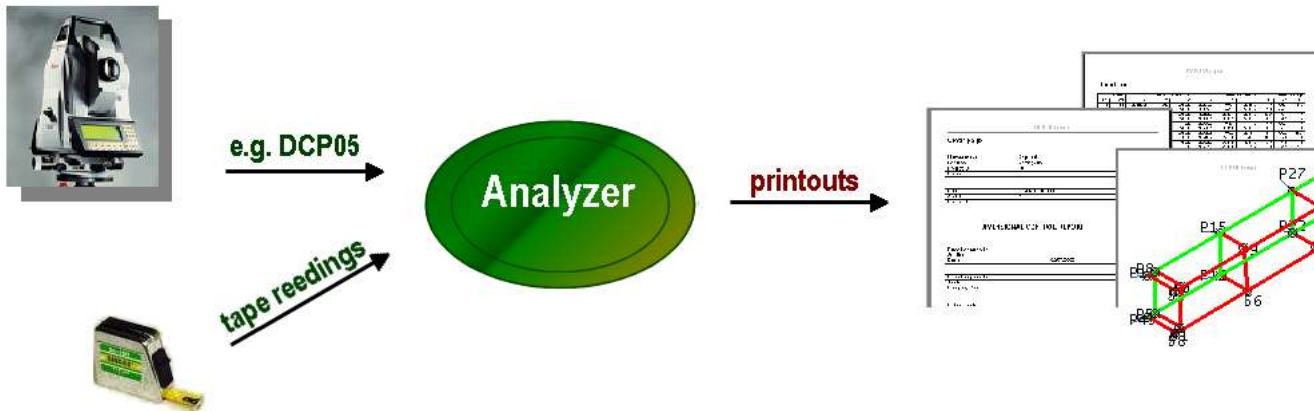




Reporting

With the Analyzer user can fast and easily generate MS Word deviation reports

- The default report consists of Cover page, Point list page(s) and selected pictures about objects.
- User may create, modify, and use his own report templates.
- User can select all points to be included to the report or select certain object(s) with a mouse click.
- Reports can be read on the screen, edited, saved, and emailed or printed.

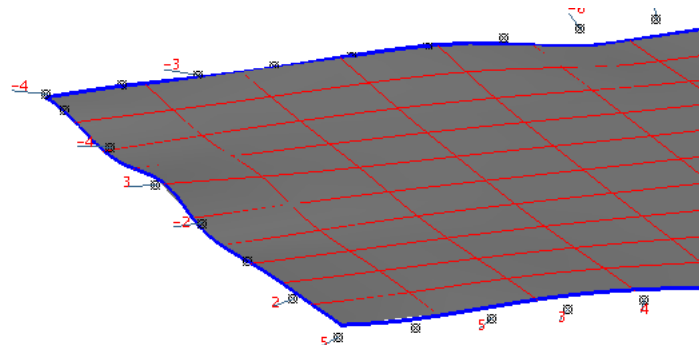
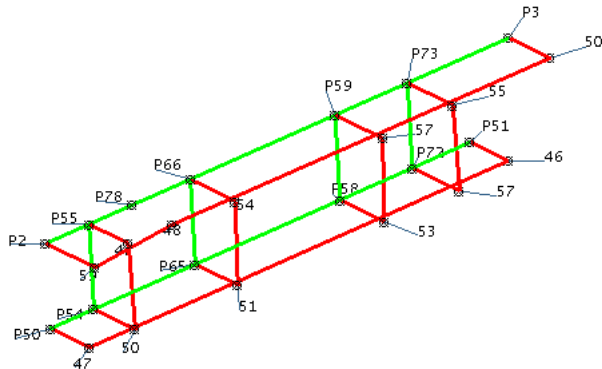




Why DCP100 Analyzer ?

By using the Analyzer...

- ... significant amount of work hours can be reduced in the critical assembling stages. Comprehensive visualization of 3D structural distortions cuts unnecessary repair work.
- ... the evaluation of the actual structures is performed efficiently. The actual-design comparison is accomplished by using objects instead of separate points, e.g. actual surface is directly set against to the design one. In addition unique tolerance control is implemented.
- ... various forms of the actual data can be applied. 3D coordinate data is imported from a file or typed manually. Single dimensional deviations, e.g. tape readings, can be manually inserted.





More about Simulator

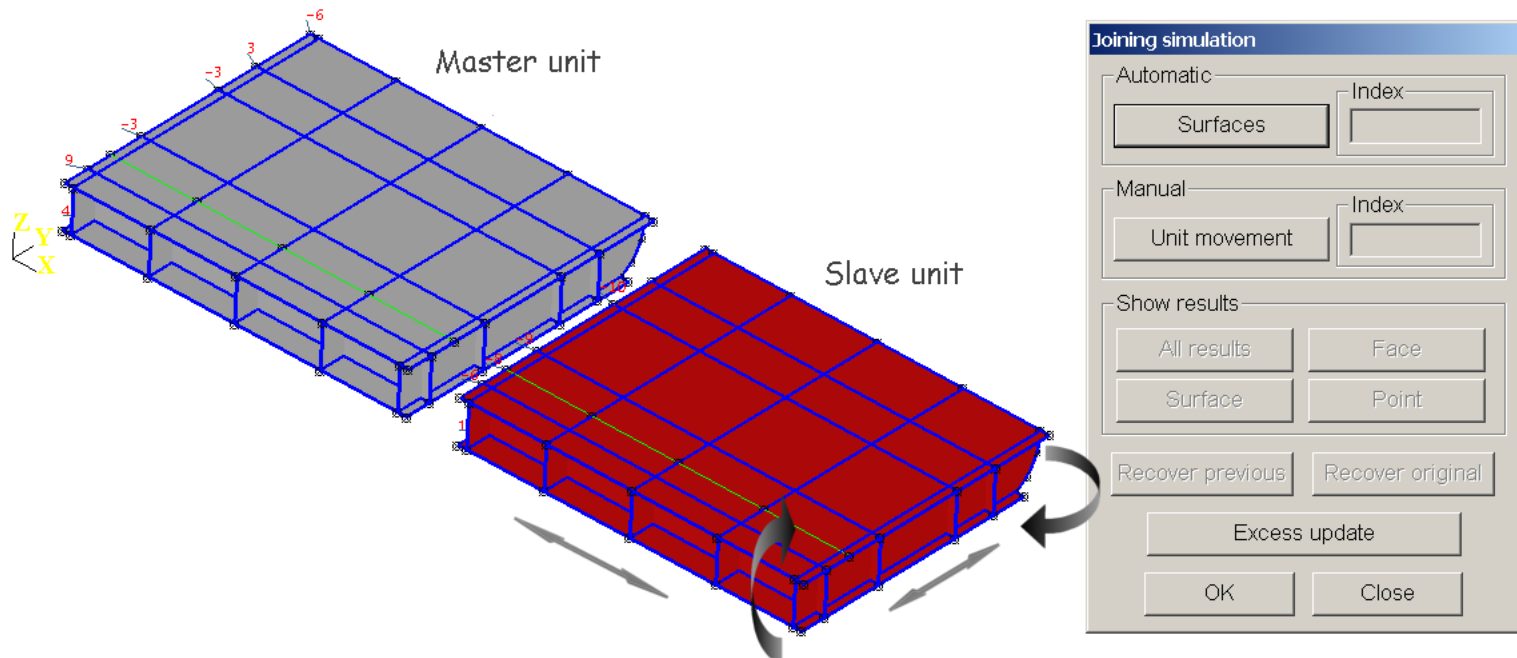
Simulator module is used to simulate the alignment and the joining of two adjacent ship structures.

- Two units are selected, one being the Master and the other Slave unit. Simulating is done by moving and rotating the Slave unit relative to the Master unit.
- Variety of align methods is available to position the Slave relative to the Master unit in an optimal way in order to reduce the adjustment work.
- A set of distance calculation functions are used to verify the critical scalar dimensions of the combined unit.
- Two special displays are used to evaluate the success of the unit merging. Displays are called Weld gap and Cut map.
- MS Word reporting feature is available for delivery to report the results of the optimal unit fit.



Joining simulation

The alignment and the joining of the Master and Slave units is simulated by moving and rotating the Slave relative to the Master.



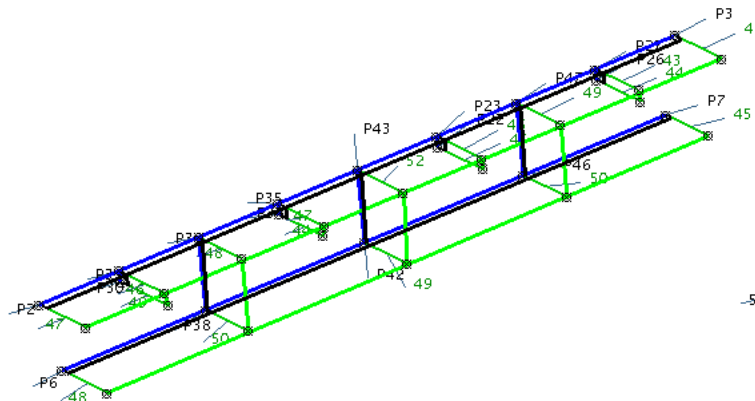


Special displays

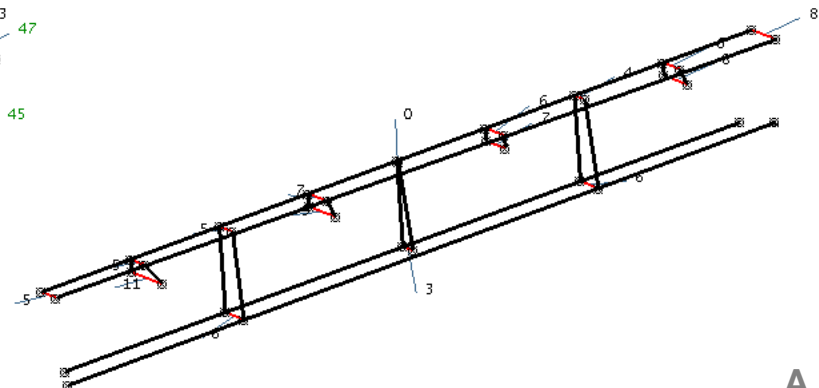
Two special displays called *Cut map* and *Weld gap* are available to review the results.

- In the case of excess material the Cut map display shows the amount of the cut at each point. Excess is shown with **green** color.
- The Weld gap display shows the width of the weld gap at each joining point after removing the excess. By adjusting the amount of the excess cut the width of the weld gap is observed correspondingly. Weld gap is shown with **red** color.

Cut map:



Weld gap:

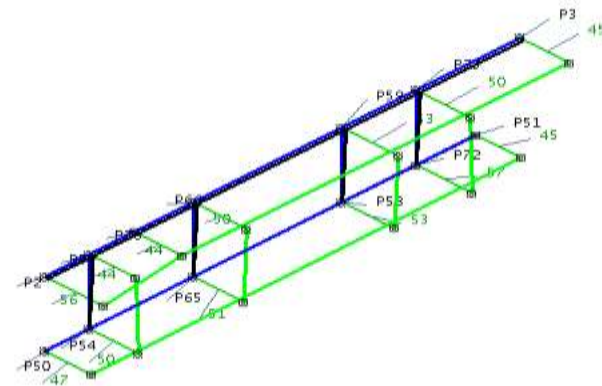
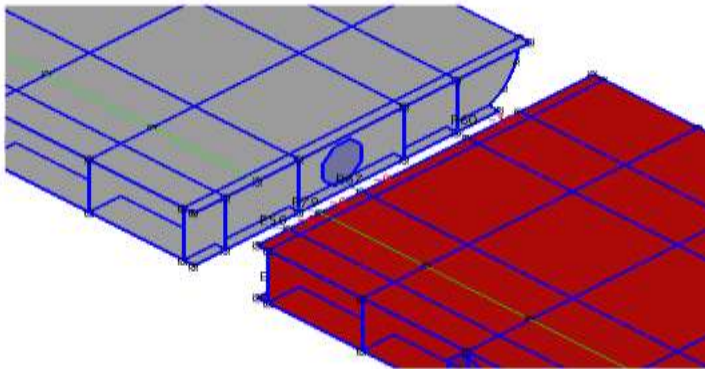




Why DCP100 Simulator ?

By using the Simulator...

- ... productivity is remarkably improved in the critical assembling stages. Easy to use alignment methods and the excellent graphics will reduce significantly the adjustment and repair work.
- ... the monitoring of the joining process is done easily. Specific user menus and proper graphical displays are available to achieve the best possible location for the joining structure.
- ... various forms of working instructions can be applied to clarify the alignment task. Graphical and numerical printouts of the joining maps can be created and delivered for production.

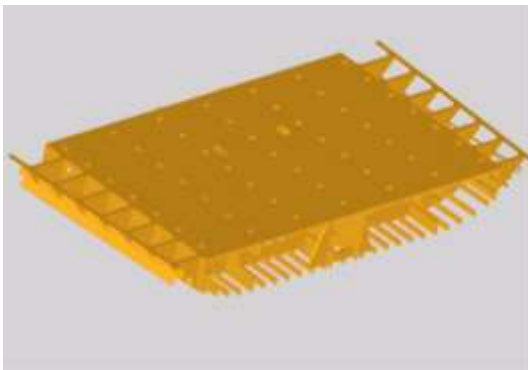




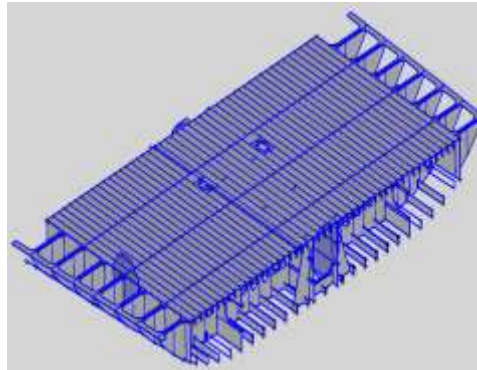
More about CAD file import

Several CAD file formats and CAD/CAM systems are supported.

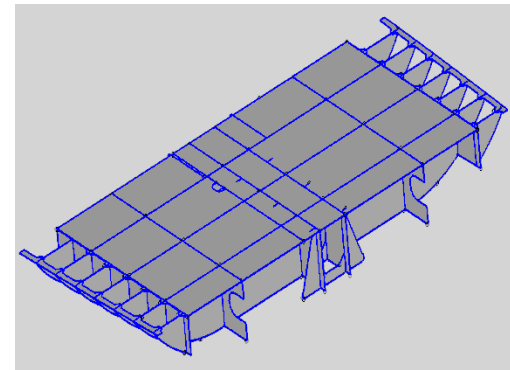
- **DXF** (R2002 and earlier)
- On request: IGES, STEP, STL, and VRML
- Also possible: ACIS-SAT, Parasolid XT, ...
- Tested ship CAD/CAM systems: Nupas, Tribon, and Foran



Unit displayed in DXF format.



Unit automatically translated to PRD format and then displayed.



Same unit after simplifying to fit perfectly for dimensional control purposes. Modeller simplifies the unit fully automatically.