NEMETSCHEK Scia

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November 2011

Welcome to the **November 2011** issue of the Nemetschek Scia eNews. This month we present you the following topics:

- Frilo Statics International Release
- NEW: Scia Steel Manager - 3D visual monitoring of the steel fabrication processes
- User Contest 2011 - Winner of category 3: Warehouse for Spent Nuclear Fuel - STATIKA s.r.o.
- Tips & Tricks Scia Engineer: Definition of a variable slab thickness

ATTENTION: Please note that all support numbers in our Belgian HQ have been changed!
We invite you to visit our contact page for the new numbers.

Frilo Statics International Release

With the increased acceptance of the Eurocodes throughout Europe and beyond, Nemetschek is releasing **more engineering design tools**. On the one hand **Scia Engineer** is the multi-material 3D modelling and finite element analysis solution, on the other **Frilo Statics** brings practical design modules for structural members. Out of the large library of modules, Frilo is gradually modernizing and adapting the modules.

Today the international Frilo offer - with 10 modules - illustrates the competence in various domains of structural engineering:

- DLT – Continuous Beam (reinforced concrete) (EC with NA for BE, NL,CZ, DE, AT and IT)
- B2 – Reinforced Concrete Design (EC, NA for BE, NL, CZ, DE, AT and IT)
- B5 – Reinforced Concrete Column (EC, NA for BE, NL, CZ, DE and AT)
- B6 – Punching Shear Analysis (EC for BE, NL, CZ, DE and AT)
- B7 – Flight of Stairs (concrete) (EC with NA for BE, NL, CZ, DE and AT)
- MWX – Masonry design (EC with NA for AT, BE, NL and CZ)
- HO13, HO14 – Timber connections (EC with NA for AT and DE)
- STT – Single-Span Steel beams (EC, NA for NL)
- STS – Single-Span Steel columns (EC, NA for NL)
- BTII – Lateral Torsional Buckling Analysis (steel) (EC, NA for BE, NL and CZ)

An extra option is the Document Designer, to generate a nice engineering design report, incorporating also other external documents (Word, Excel …). For a free try-out or purchase, we invite you to visit the Nemetschek Scia's webshop.

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NEW: Scia Steel Manager - 3D visual monitoring of the steel fabrication processes

Crossing the bridge between CAD and ERP systems the new Scia Steel Manager from Nemetschek Scia is innovative new software which soon will occur on each desk in a steel fabricator company. Absolutely simple in use, it makes the workflow in a factory entirely transparent and visible, from order processing until erecting a structure.

"Click & Know" is what happens when the Scia Steel Manager is on your computer: Which assembly is this? Which parts belong to the assembly? What is the status of fabrication? Has it been transported already? Has it been erected? ...

Seeing is believing, therefore take the chance to contact our Fabrication Solutions Division for a demonstration and/or a visit.

Nemetschek Scia offers a fully integrated solution for the steel fabrication industry.
We invite you to read our latest Nemetschek Scia Steel brochure.

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## User Contest 2011 - Winner of category 3: Warehouse for Spent Nuclear Fuel - STATIKA s.r.o.

About STATIKA s.r.o.
STATIKA s.r.o. was founded in 1998 and today it is one of the leading engineering companies engaged in the design and assessment of load-bearing construction works, engineering and the construction of bridges in all kinds of materials.

About the project
The presented project is the winner in 'Category 3: Design of industrial Buildings and Plants' of the Nemetschek Engineering User Contest 2011. It concerns a warehouse for the storage of spent nuclear fuel in the nuclear power plant of Temelín (Czech Republic). The structure is designed according to international standards for nuclear power plants, which take precedence over the national standards ČSN EN and which represent a very large set of standards and regulations.
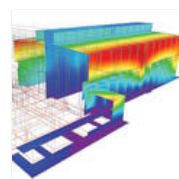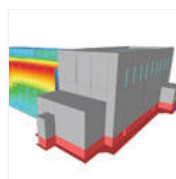
The building is a solution at the end of the fuel cycle, before placing the spent used fuel into a deep nuclear waste repository. The warehouse is divided into two parts - the receiving and the stock unit. The storage part measures 46.7 x 74 m and has a height of 24.3 m. The receiving part is 25.5 by 67 m and has a height of 25.85 m. The foundations are designed as two-segment robust concrete

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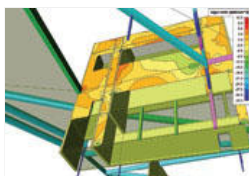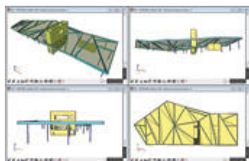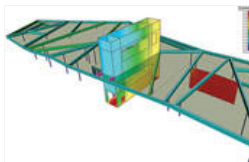
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foundation strips, which together create a solid base grid. The building is a monolithic reinforced frame structure with a precast-monolithic roof.

For the global static and dynamic analysis several 3D and 2D models were created in Scia Engineer.

Quote of the Jury: "*The project was chosen because of the complexity of the special load cases, such as seismic loads, aircraft impact and explosion loads. Also the nonlinear behaviour, the calculation of gradual execution and the interaction with the subsoil added to the high technical level of the project.*"

► Play YouTube Movie
► Download pdf: "Warehouse for Spent Nuclear Fuel - STATIKA s.r.o."

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Tips & Tricks Scia Engineer: Definition of a variable slab thickness

In the latest Scia Engineer versions, the possibilities for the definition of a variable slab thickness have been extended.

When creating a new 2D member, the property 'Thickness type' is by default 'Constant' and cannot be changed. The reason is that a thickness variation is related to the edge nodes of the slab, so the slab itself has to be input first. Afterwards the 'Thickness type' can be put to 'Variable' via its Properties menu. At that moment, the input options for the definition of the variable thickness appear, see image 1.

The options Direction X / Y / Z allow the thickness to vary in the global X / Y / Z direction, while the options Local X / Y allow a variable thickness in the local x or y direction of the slab. In both cases the user has to select two slab vertices (nodes that are part of the slab edge), for which the thickness can then be specified. The thickness is extrapolated automatically to the other member nodes.
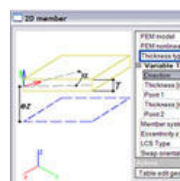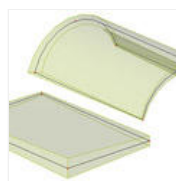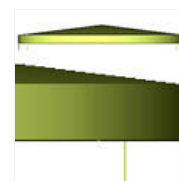

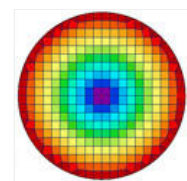*Image 1*   *Image 2*   *Image 3*   *Image 4*

Note that the options Local X / Y are only available for plates and straight walls (not input as shells!); the same is valid for Variable in two directions.

For all 2D members with 4 slab vertices the option Variable in 4 points is available as well. For each of the 4 (principal) edge nodes, the thickness can be input by the user. An example is shown in image 2.

For circular slabs a last option Radial is available, with this option the user can define the thickness in the centre of the slab and on its edge. Additionally, it is possible to adapt the eccentricity to obtain the result as can be seen in image 3.

Keep in mind that the finite element mesh size will influence the accuracy of the variable thickness of the member, since each finite element has a constant (averaged) thickness. This can be checked via the Main menu > Calculation, mesh > 2D data viewer, for the resulting self weight of the structure, see image 4.

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