TECHNICAL ARTICLE

Improvements in FORAN Electrical design

April 7th 2017 - FORAN, developed by SENER, it is known for being the only product of its kind on the market. It encompasses every aspect of design in a fully integrated way and it is used at every stage of the design and production of vessels and marine structures.

The Electrical Design package of FORAN that provides an efficient connection between the electrical department and the other design disciplines and advanced functions to manage all relevant aspects in design and production of electrical systems, has undergone a very important update in the last versions.

The most relevant functionality included in FORAN Electrical Subsystem in the latest versions V80R1.0 and V80R2.0 are the management of conduits with cables in electrical trays, to have smart cable interconnection drawings, the reuse of electrical diagrams from external sources into FORAN, the management of electrical penetrations with multiple frames and a cable installation planning capability.

As said, one of the new capabilities that has been included in the Electrical Design Subsystem allows the management of flexible conduits in cable trays. It responds to a general demand of having the ability to use electrical conduits, either with or without cables contained in them, along with other cables out of conduits, in the same electrical trays, considering all of them in the tray calculations. It also allows the use of shielded conduits through part of the route of cables requiring special protection in some compartments and enables the routing of different Electro Magnetic Compatibility (EMC) cables in cable runs where there would not be enough space to keep the required separation distance between segregations otherwise.

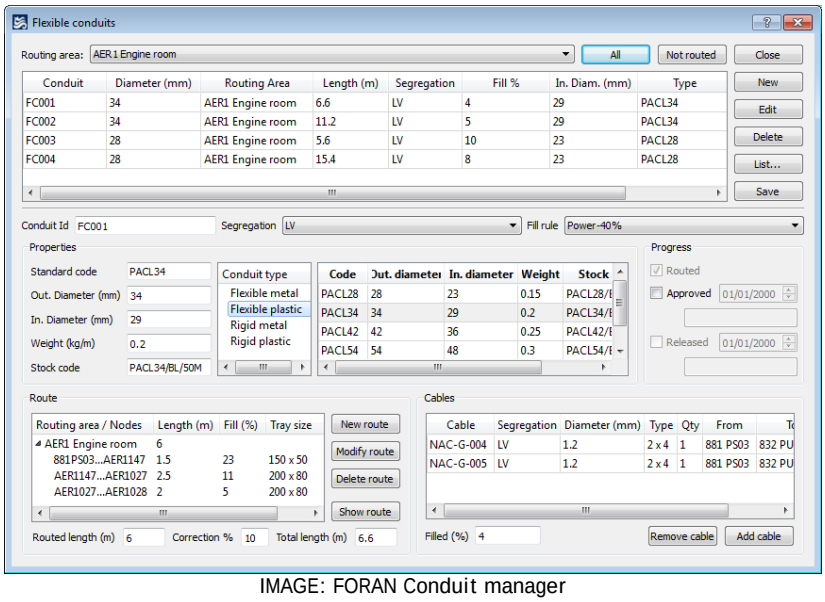

IMAGE: FORAN Conduit manager

For more information:
Verónica Alonso. SENER.
Tel (+34) 91 807 71 97
www.foransystem.com

In this way, designers will be able to manage flexible conduits in a similar way as if they were cables, completely integrated in the project, carrying out tasks such as: create conduit items in the project from standard library parts having its own unique identification, route conduits through the electrical nodal network, sharing runs with cables and other flexible conduits, manage cables contained in conduits, considering the constraints regarding both the filling and the electromagnetic compatibility and manage conduits maturity, allowing a correct control of installed conduits. This features strengthens FORAN as a leader in its sector, as it makes FORAN unique as a multi-discipline CAD/CAM/CAE system managing this type of information.

One of the most interesting new features is the possibility to generate cable termination information in electrical 2D diagrams and having new types of automatic and customizable cable connection sketches. The cable termination data in electrical diagrams offers the designer the possibility to generate automatically the information at any cable within the diagram and allows him to customize the representation of the cable connection block and its position in the drawing, taking advantage of the automatic refresh of the automatic refresh of these data in case it is updated somewhere else in the project.

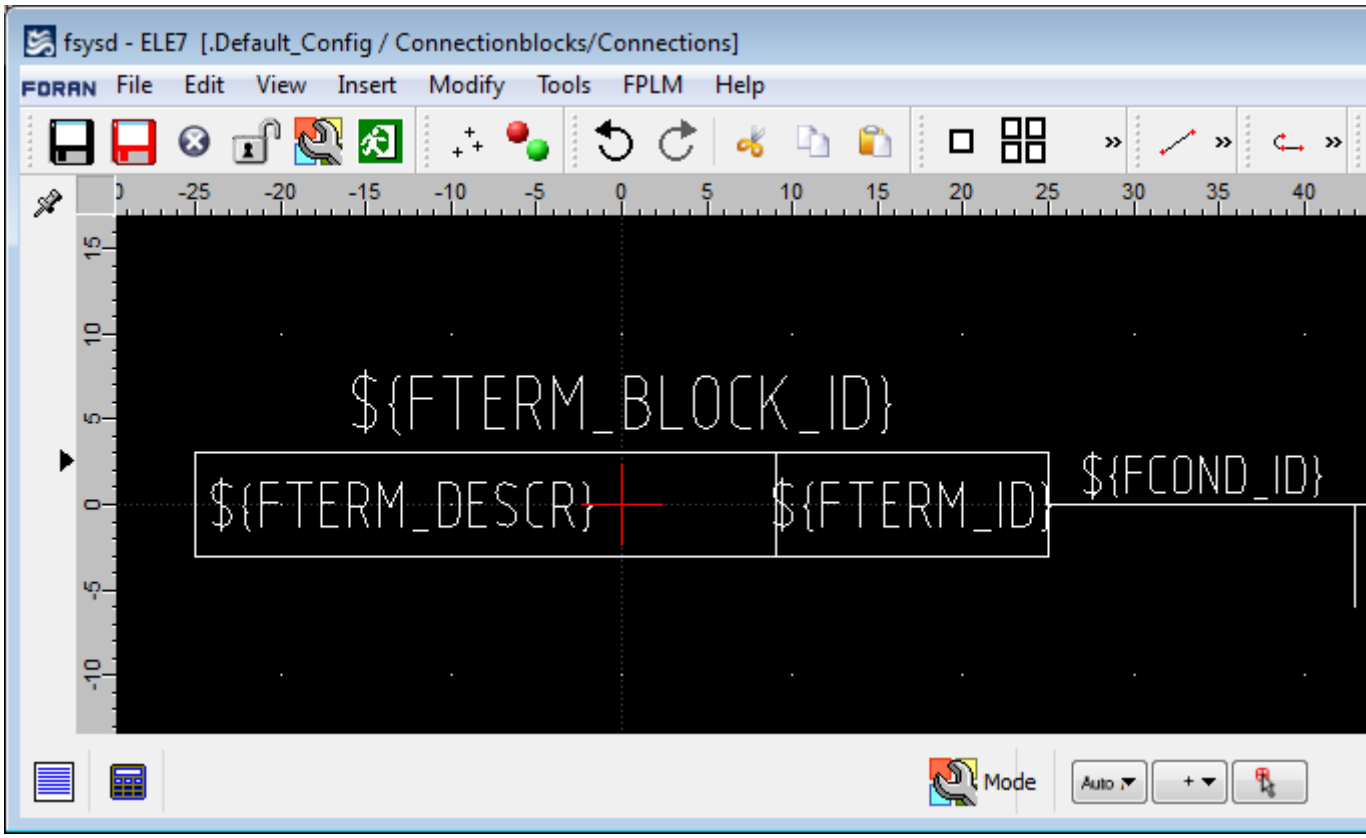

IMAGE: FORAN Cable connection blocks

It is remarkable the strong commitment that SENER has with its customers, so it has taken particular account the needs of the military shipbuilding and offshore industry to incorporate two new connection sketches for cable installation into the System.

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These automatically generated documents enable the availability of this type of reports in the production environment, offering a great reliability in terms of the accuracy of their content, an easy-to-interpret information to the installer and significant time savings for the designers, as all the data are obtained from the information defined in the project without requiring manual input.

It was also a demanded feature to be able to import information contained in third party drawings coming from other CAD systems into the FORAN System. This new functionality, the reuse of electrical diagrams from external sources into FORAN, may help those shipyard or design offices using FORAN in the task of integrating in the project electrical diagrams supplied by partners or subcontractors in the form of non FORAN native drawing files, allowing them to save time by reusing information instead of duplicating it and ensuring the correct use of the items in the project.

With the new functionality included in the management of electrical penetrations with multiple frames, designers can determine exactly the frame or hole used by each cable passing through a multi-frame cable penetration. The main benefits of this are more exact fill calculations, major control of the cable arrangement and better quality cable installation outputs.

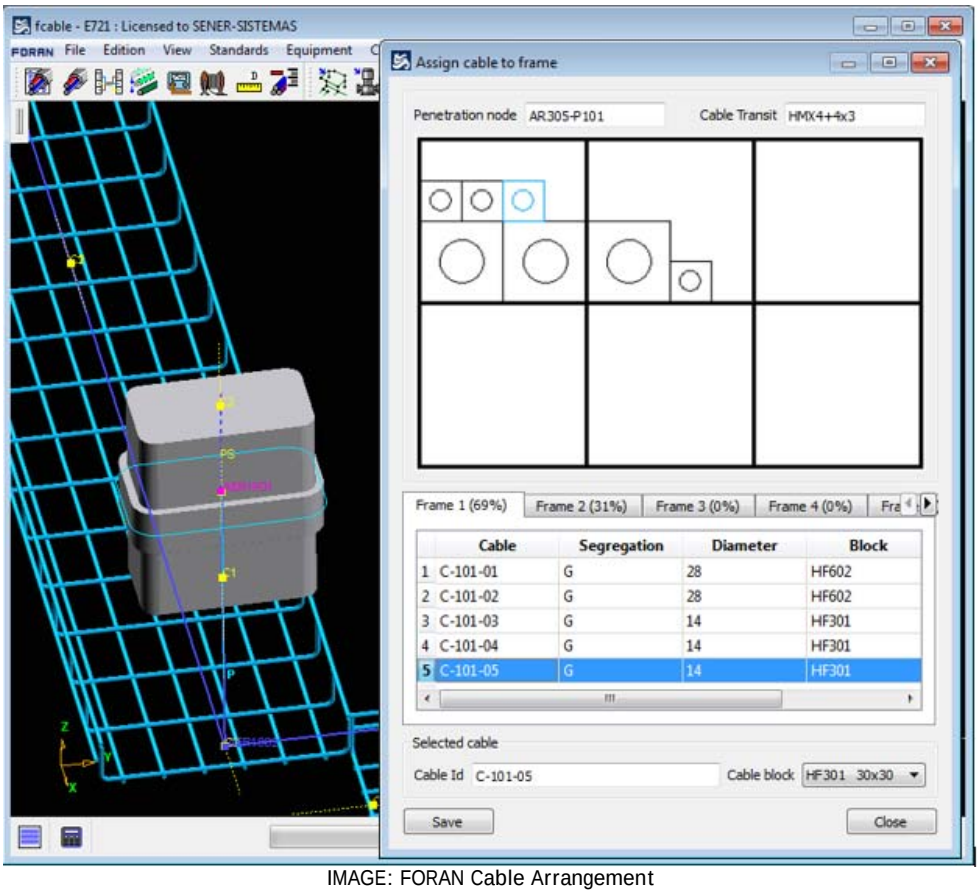

IMAGE: FORAN Cable Arrangement

In addition, now FORAN allows the use of multi-frame cable transits with different heights for two-row frame arrangements, in order to keep up to date with this kind of solutions offered by some suppliers.

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The new tool to aid in the cable planning and installation task, the cable installation planning capability, also offers a better control of the progress and cost of the electrical project.
This new capability allows the definition and management of cable installation activities. Cables can be linked or associated to work packages for cable pulling or cable termination.

To finish with this list of great improvements of the FORAN Electrical Subsystem, SENER has included a new capability to manage cable backshells, which are used at cable ends and are related to connectors. Besides, the management of cable glands allows now the definition of user attributes.
Of all these improvements we can see how SENER is at the forefront of shipbuilding, having develop a shipbuilding oriented CAD/CAM/CAE System, FORAN, which is continuously growing and improving with the years.

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