Fabrication Challenges
One of the key challenges for fabricators is to optimise their production planning. Optimisation enables fabricators to minimise the production time and cost, while allocating their resources and yard space more efficiently. This means they have to interpret the information provided to them by the EPC contractors, which generally includes numerous 2D drawings, spreadsheets and, sometimes, 3D models. Unfortunately, this information is often not in a format the fabricator can use efficiently. Hence, new drawings need to be produced before the production planning can start, which obviously delays the whole fabrication process. These projects get even more complicated when the EPC makes changes to the design and the fabricator has to propagate those changes through their drawings.

Lightweight Production Model (LPM)
One of the main reasons for the disconnect between design and fabrication is that the 3D models produced by the EPC tend to be too large and data-rich for use in production planning. Furthermore, 3D design software usually has limited options for fabrication planning, estimation and fabrication simulation. Added to that, the software is often too complex to be used efficiently by personnel such as project planners and estimators.

To ease this transition from the EPC’s design office to the fabricator’s yard, Intergraph Process Power & Marine’s Arne Monsholm, vice president of business development for the Marine industry, talks about recent software developments which help to ease this transition. This new approach to modular construction can also facilitate change management and enable fabricators to deal efficiently with mundane but essential items such as scaffolding, lifting lugs and crane operations.

Modular construction is widely used for assets such as offshore structures, ships and onshore plants. This approach allows for greater efficiency, including parallel construction of modules. However, the transition from the EPC’s design office to the fabricator’s yard can be inefficient and time-consuming. Intergraph® Process, Power & Marine’s Arne Monsholm, vice president of business development for the Marine industry, talks about recent software developments which help to ease this transition. This new approach to modular construction can also facilitate change management and enable fabricators to deal efficiently with mundane but essential items such as scaffolding, lifting lugs and crane operations.
The Object Property Manager gives a spreadsheet-like view of the model’s properties so planners can extract BOMs for time and material estimates.

Scaffolding is essential for most fabrication projects, but its design can be labour-intensive as it usually involves manual processes. Intergraph’s software suite has a dedicated module that makes 3D scaffolding design much more efficient. The catalogue and copy functions enhance the designer’s productivity and once the design is completed, the BOM can be generated automatically. Having a good scaffolding design available at an early stage also helps to make the work processes in the yard more efficient and safer.

Once the blocks or modules have been fabricated they need to be moved around the yard by a crane or on a transporter. LPM has functions for managing lifting lugs and calculating the centre of gravity of each piece to be lifted. The user can also determine the required length of the lifting accessories and analyse the movements to be made by cranes and transporters. This makes the whole process much more efficient and enables the user to identify potential bottlenecks in a crowded yard at an early stage.

Revision Management

Any large project is subject to constant revisions, which often creates a significant workload for the fabricator and can lead to costly mistakes. Intergraph’s LPM has a powerful revision management module which can operate automatically or interactively and identify any changes in revised designs. This can be done at the project or block level.
Improving Productivity

Our customers have made very significant productivity improvements. It’s not just that they can produce the drawings for the yard more quickly. They can now do what-if analyses to decide if it is worth rotating a component so they can weld it in the orientation their equipment works most efficiently in. Similarly, they can try out and rehearse transport operations on screen, which is obviously much easier than handling modules weighing hundreds of tonnes. Basically, we offer them a complete planning solution, from cutting the first plate through to final outfitting of the vessel or module. This saves significant time at the start of the project, when they receive the first LPM from the EPC. It also improves the workflow and efficiency throughout the rest of the project, in the offices as well as in the yard. Our customers tell us they’ve managed to save 30% to 50% of the time needed to plan their operations. As a bonus, they’re now much less worried by revisions the EPC makes to the design. So using our LPM solution improves profitability and also contributes to better relations with the EPC.

The Author:

Arne Monsholm is vice president of business development at Intergraph Process, Power & Marine, soon to be known as Hexagon Process, Power & Marine. Intergraph PP&M is the leading global provider of engineering software for the design, construction and operation of plants, ships and offshore facilities.