Background

AVEVA Marine for the Hull model was used for the very first time in a FPSO FEED project, whereas the Outfitting (Topsides) model had been already started with AVEVA E3D prior to the implementation of AVEVA Marine.

The scope of the modeling was to create a basic design Hull model including shell plates, shell profiles and all major internal structures.

The goal was to utilize the model for the following tasks:

• Create structural Hull drawings
• Create weights and center of gravity reports
• Create material take-off reports
• Export Hull model to 3rd party FEM software

The assumption was that when the basic design Hull model is handed over to the shipyard for the detail design phase, it could be utilized as a reference model to support shipyard's production model.

Hull Set-up

The "out-of-the-box" AVEVA Marine installation needed the following points set-up prior to starting the Hull modeling work:

1. Hull databases, multiple databases and top-level elements within databases to store the Hull objects were created. This included also Hull materials set-up.

   Note that the ship was broken down into three areas (AFT/MID/FWD), and databases for each area were created.

2. Hull teams and users with read/write access to Hull databases were created.

3. Hull naming conventions for blocks, panels, and mould line were created.

4. Frame table with frame, horizontal and vertical longitudinal positions for the ship model was created.

5. Hull surface was imported to AVEVA Marine.

6. Hull standards, such as brackets, cutouts etc. were created.

7. Software was customized by modifying necessary application parameters and defaults.

Lessons Learned

AVEVA Marine is a complicated software, consisting of a suite of applications, which require the Hull set-up done properly and mostly in a specific sequence. This in turn provides a robust and stabile foundation for the subsequent tasks.

The below points should be taken into consideration when setting up a AVEVA Marine project:

1. Coordinate System

   AVEVA Marine uses a right-handed coordinate system with the origin located in the intersection of aft perpendicular, centerline and baseline.

   Therefore it is crucial that the Outfitting (Topsides) model has the same origin as the Hull model.

2. Frame Table

   A mature frame table is the backbone of all modeling, and any changes to it at a later time during the project will cause a lot of extra work.

3. Hull Surface

   A faired, near production quality Hull surface is a prerequisite for the subsequent modeling of other structures referencing to it.

4. Software Customization

   The degree of detail level of the Hull model, and what AVEVA Marine applications and functionalities are needed, determine how much Hull set-up is required.

5. Hull User Training

   It is recommended that all new Hull users have at least the basic training of AVEVA Marine Hull applications before the start of the project.

   The Hull modeling team should also consist of experienced users, who can support new users to adapt the best modeling practices and make the use of the software more efficient.

Final Thoughts

This is a simplified overview of the project Hull set-up, but it underlines some of the challenges when AVEVA Marine is used for the very first time, along with an existing AVEVA E3D Outfitting (Topsides) model as a starting point.

It is also worth noting that there are many other ship design software available, which could be more suitable for various basic design modeling needs, some of them listed below:

•   CADMATIC
•   NAPA Steel
•   Rhino 3D with ExpressMarine plug-in
•   ShipConstructor
•   SmartMarine 3D