Steam Turbine Series Part 2: Modifying a Steam Turbine Model in THERMOFLEX

Using Steam Turbine Assembly menu to make model match known specifications

Feature Awareness Webinar Series

Thermoflow Training and Support

- Standard Training
- On site training course
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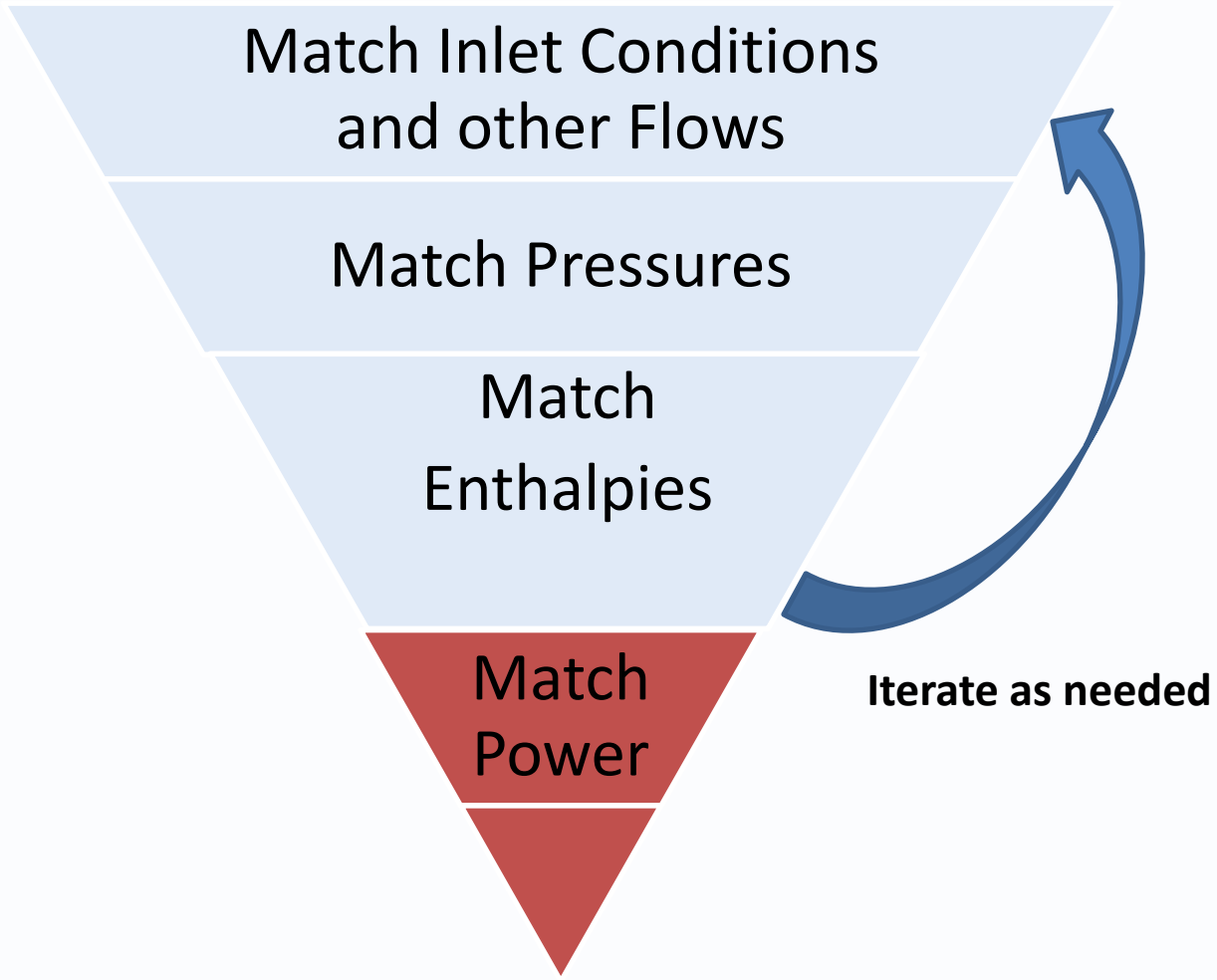
- Webinars when new version is re
- Help, Tutorials, PPT, Videos
- Technical Support

→ **Feature Awareness Webinars**

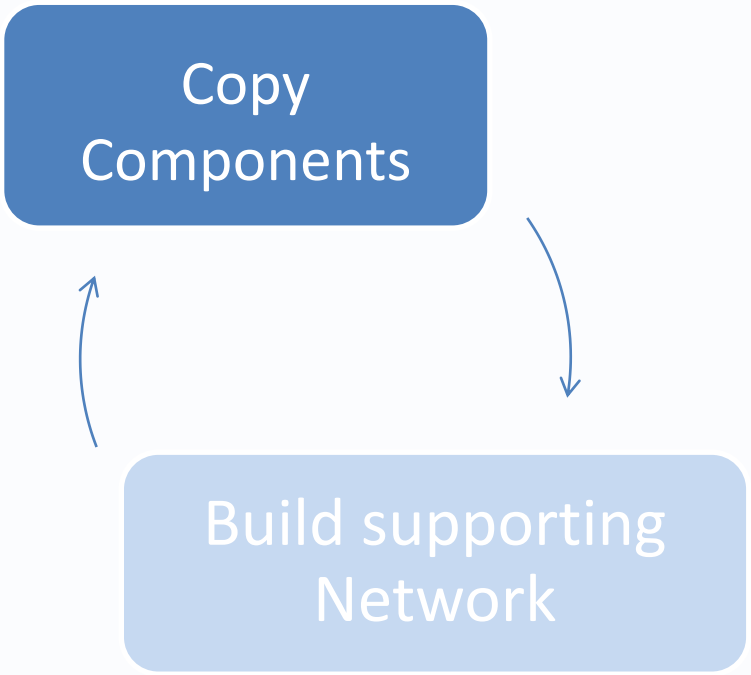
16- Multi Point Design in GTP-GTM
17- Total Plant Cost in THERMOFLEX
18- Steam Turbine Tuning
19 - Creating Your Own THERMOFLEX Component
20 – Cooling System Optimization
21 – Steam Turbine Modeling Series Part I
22 – Steam Turbine Modeling Series Part II

Modify a Steam Turbine Model: Tasks

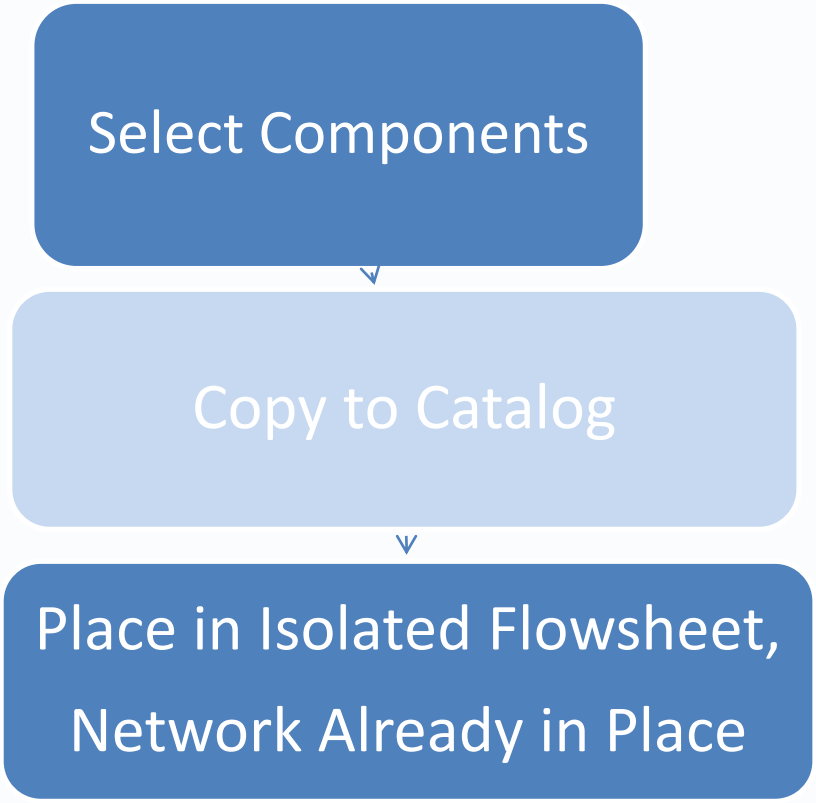


Isolate a Steam Turbine Model: Then & Now

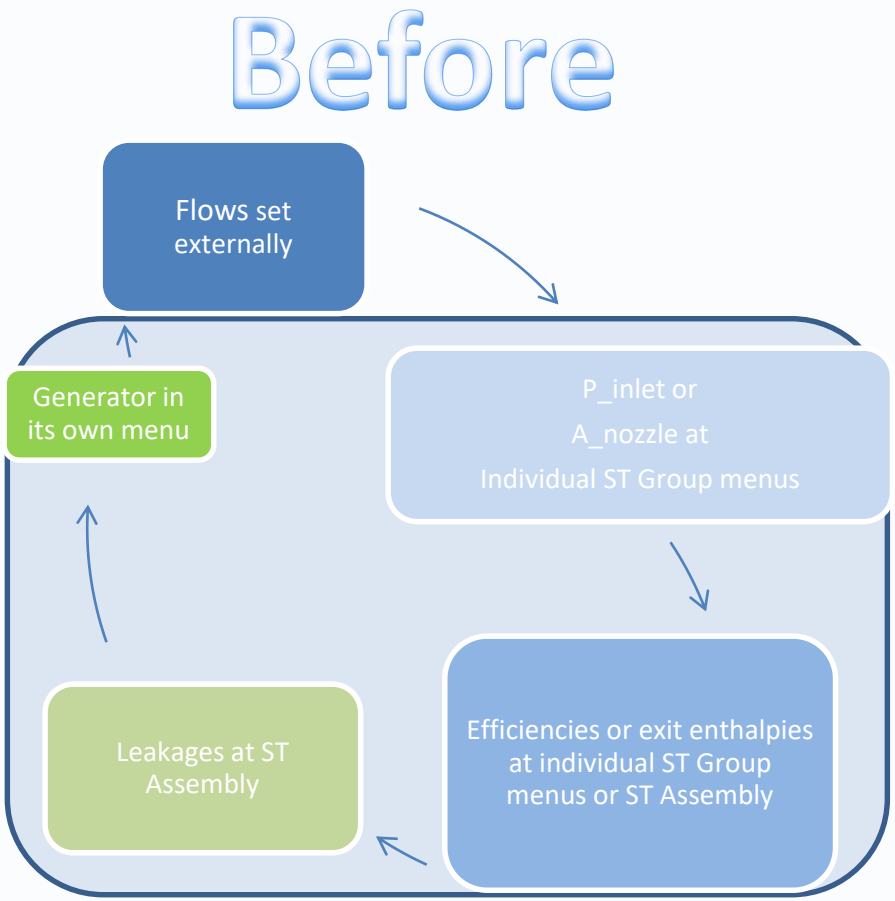
Before



Now, w/ Catalog



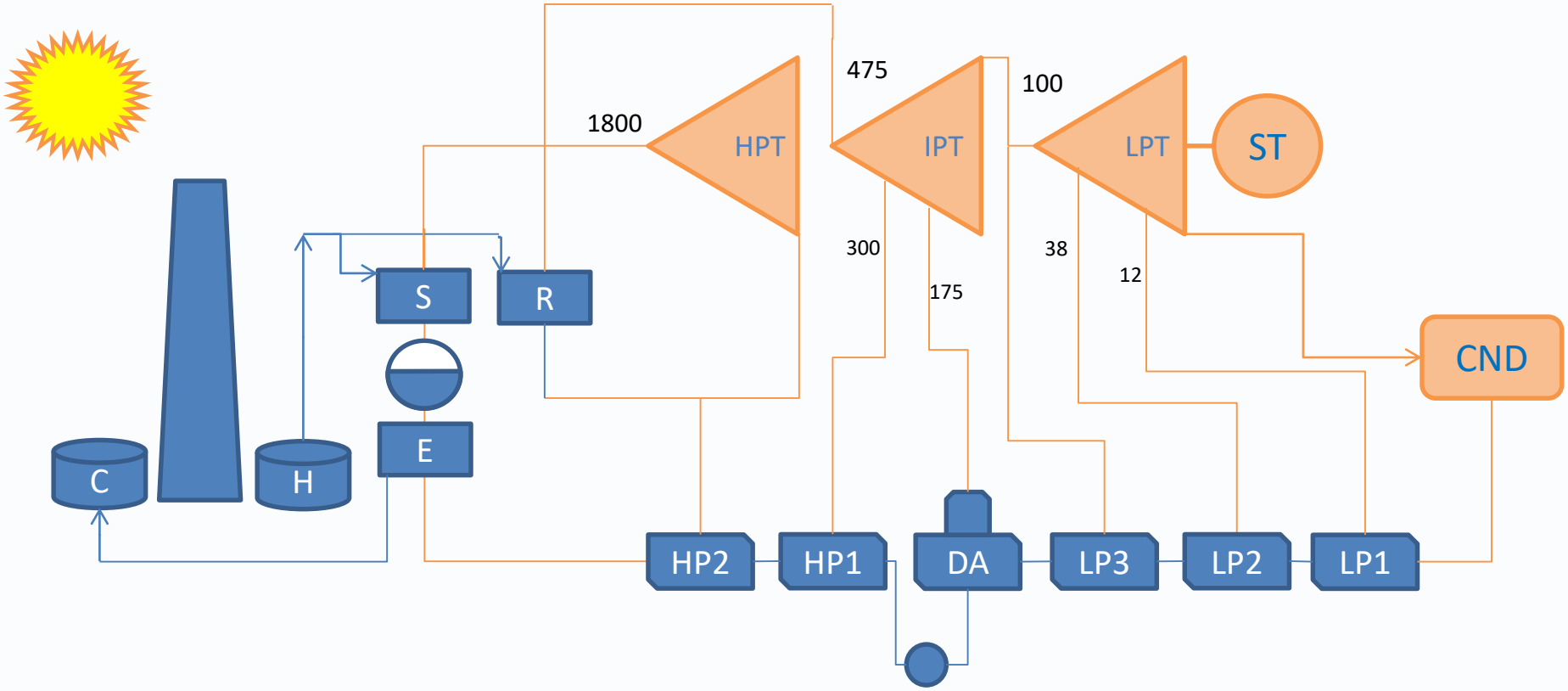
Modify a Steam Turbine Model: Then & Now



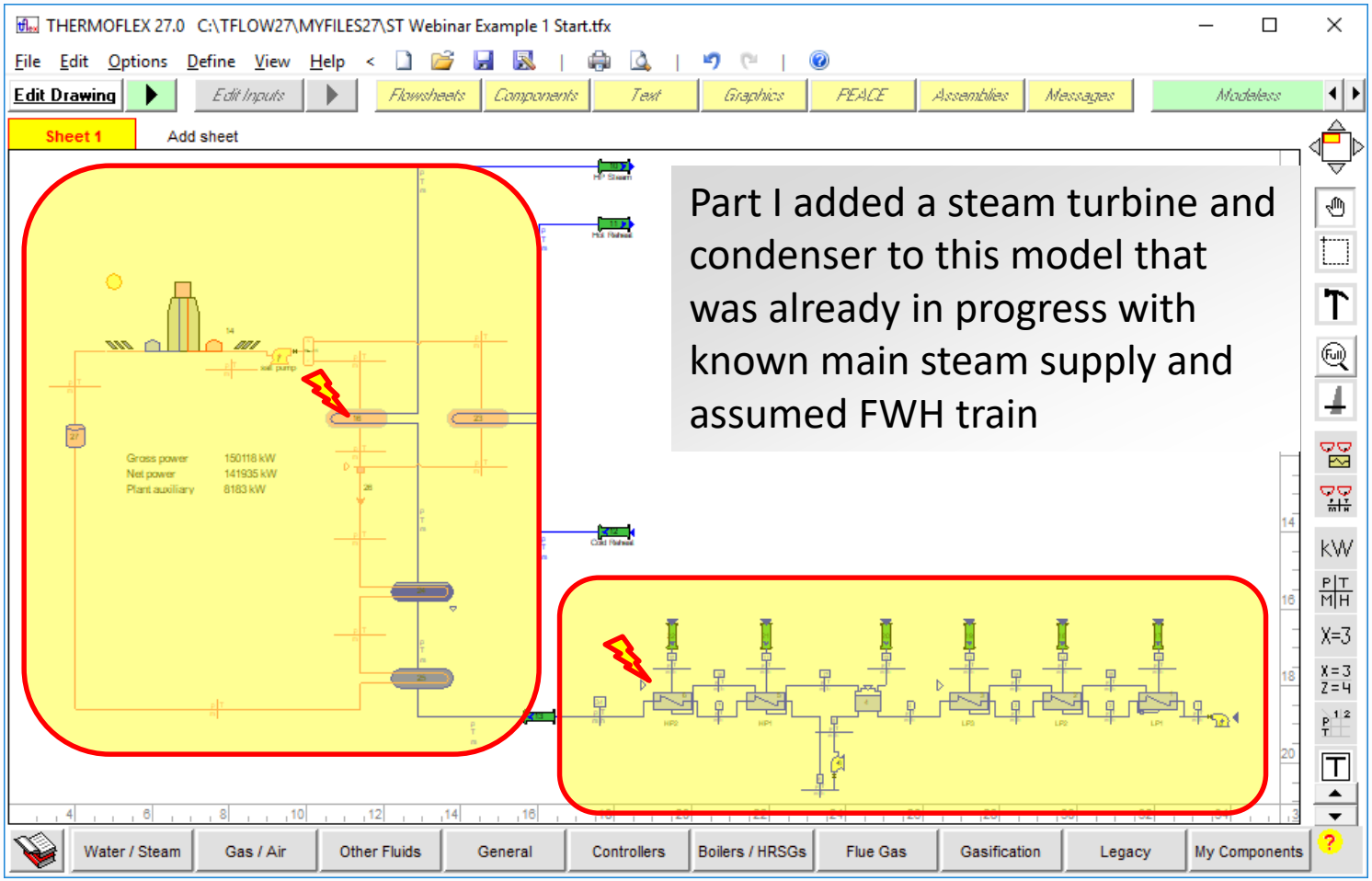
Background:
Solar Rankine Cycle of Part I

New Piece

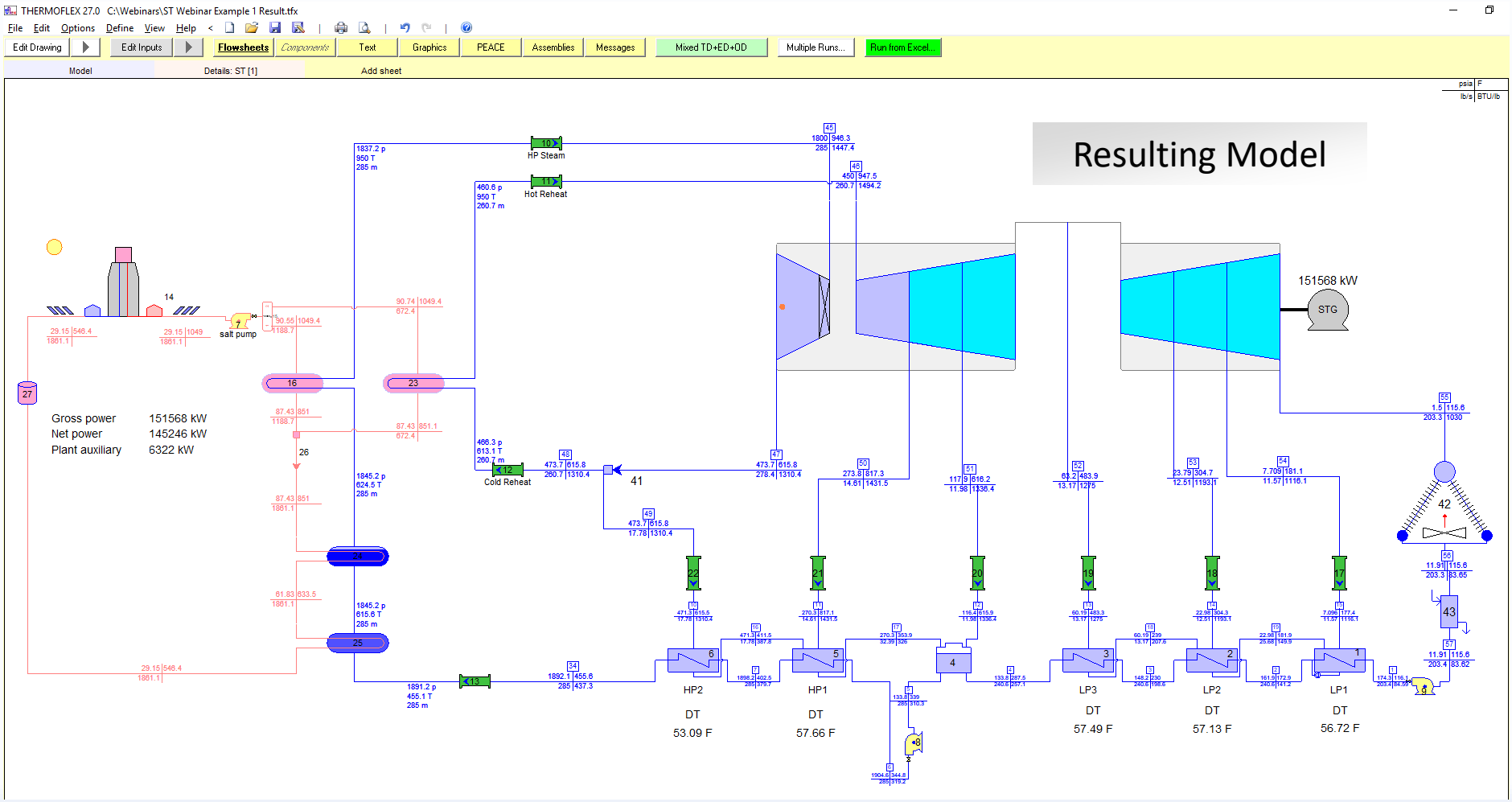
Already-built Pieces



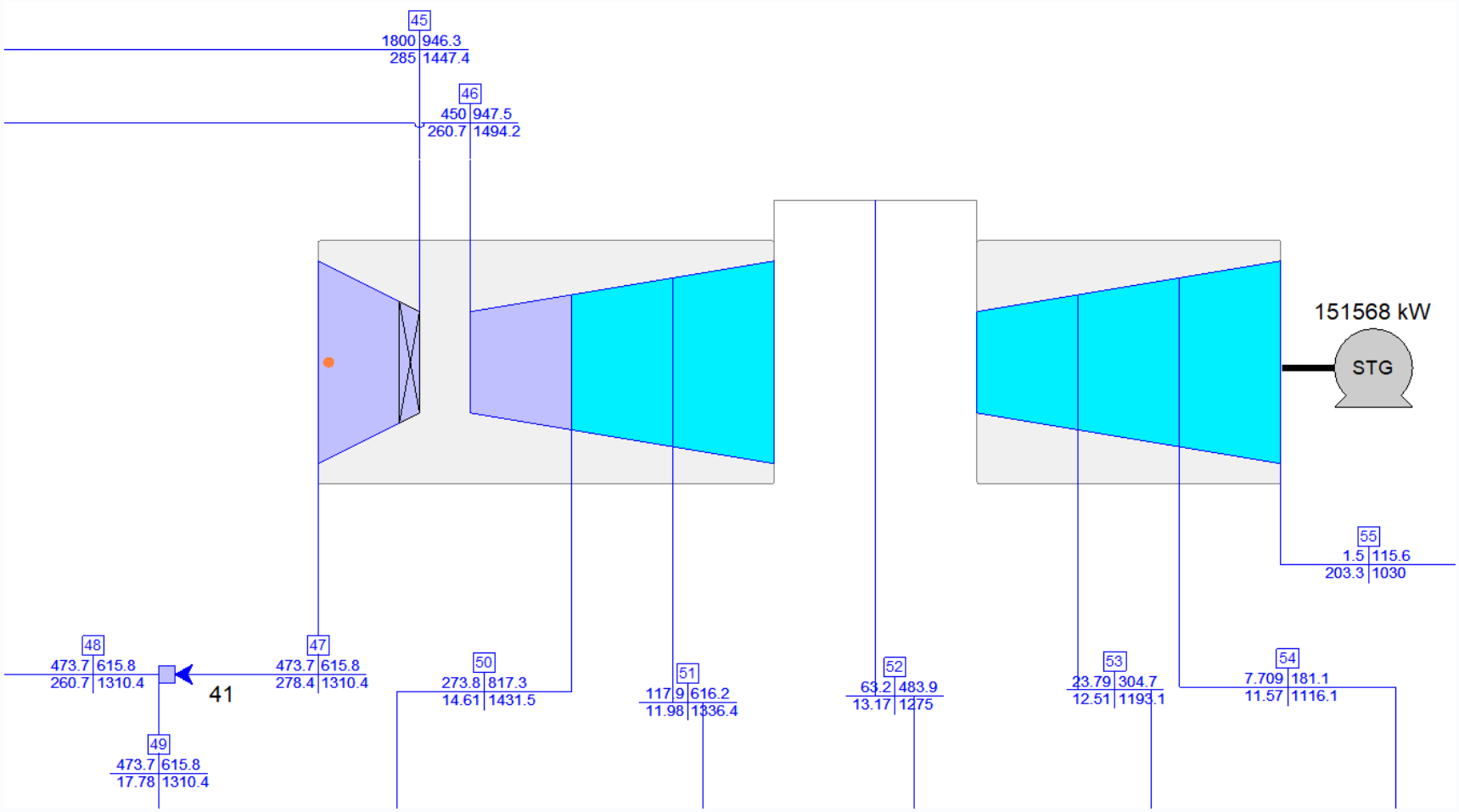
In Part I, we began with a Starter Model, representing a prospective system model …



Using the ST Assembly Wizard, a new ST was added to that Starter Model. This is where we'll pick up today



A closer look at the turbine…



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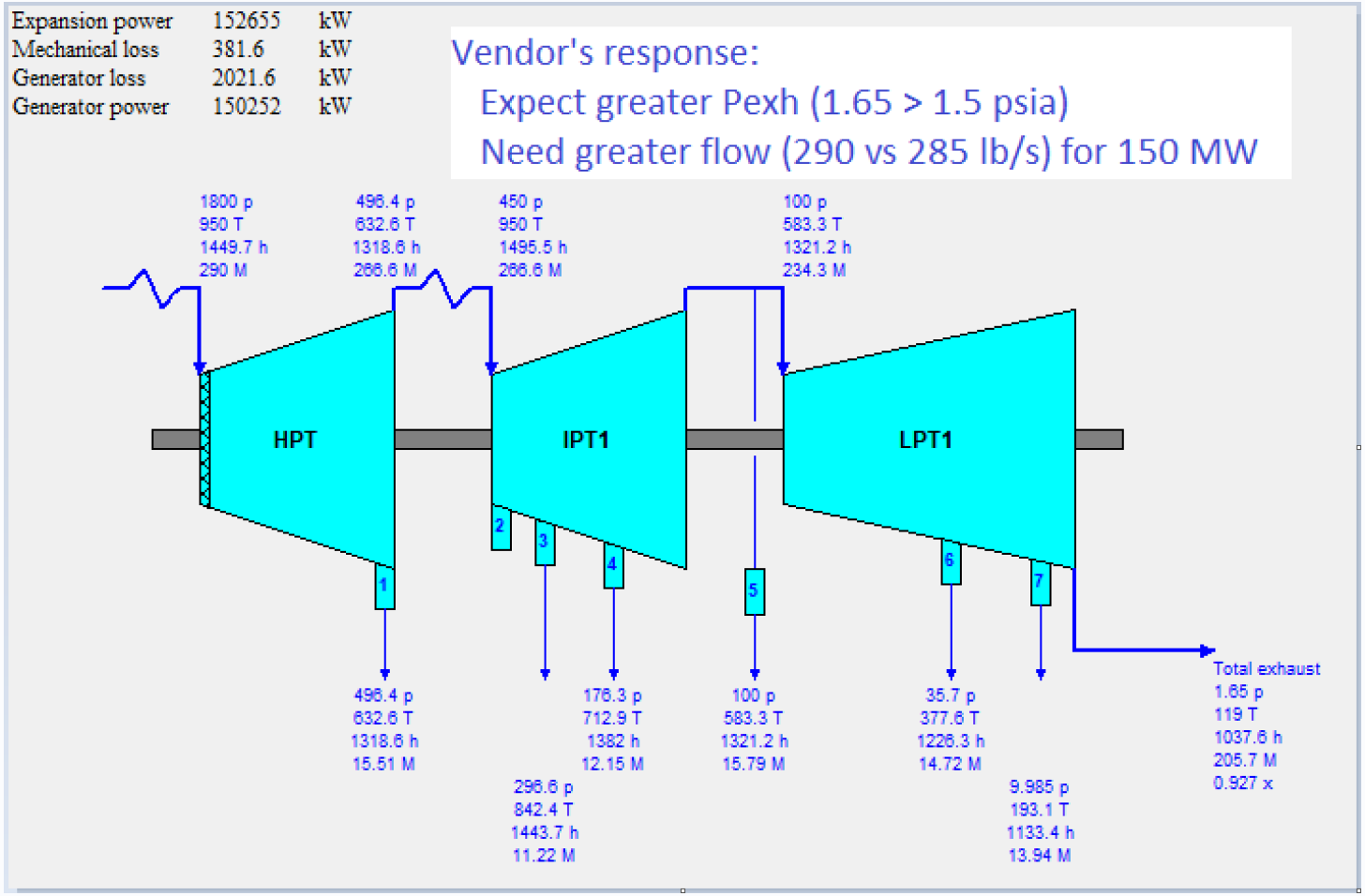
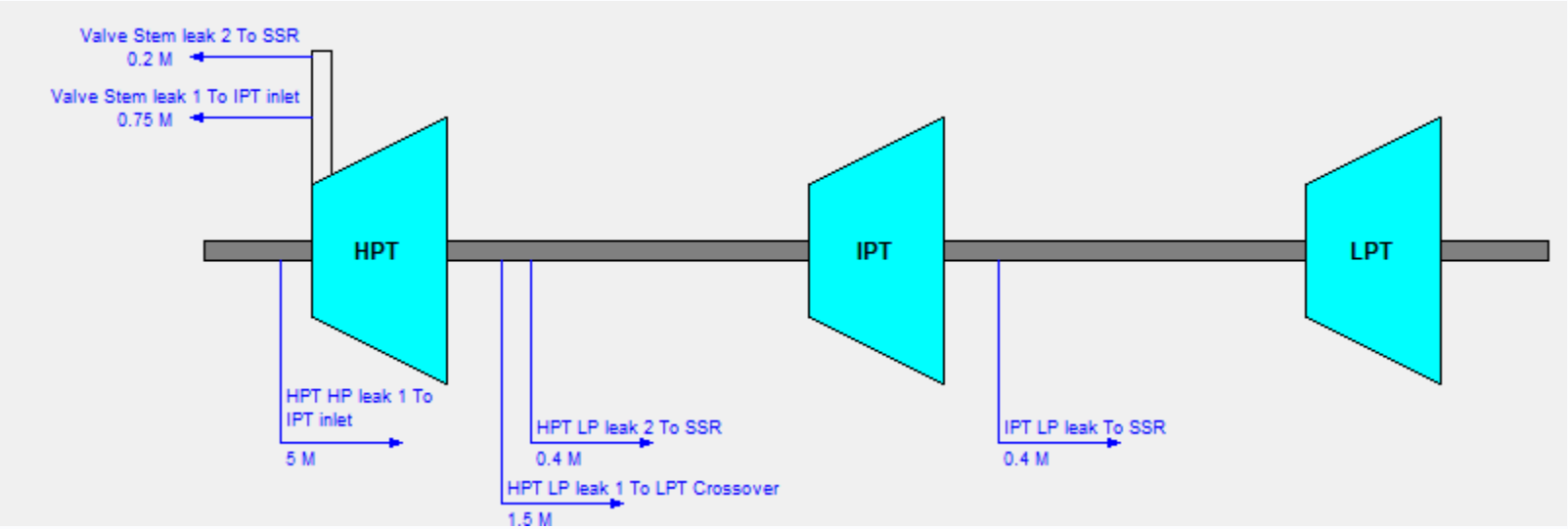
Responding to a request for a proposed turbine to fit these needs, a vendor responds with a heat balance of his own…



… with some details of packing leakages and exhaust loss.



Last stage blade length	29.98	in
Last stage pitch diameter	85.00	in
Exhaust annulus area / end	55.60	ft^2

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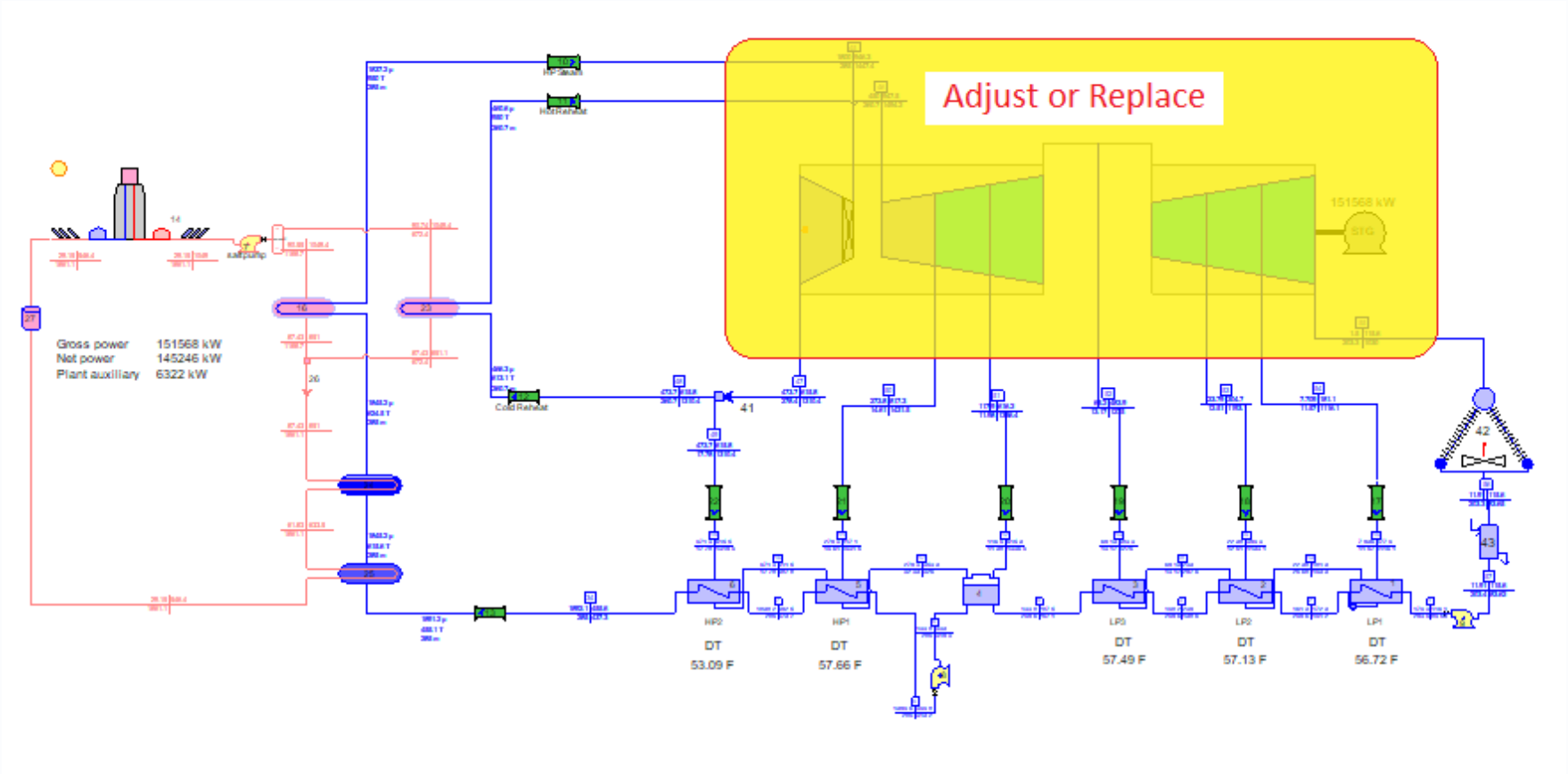
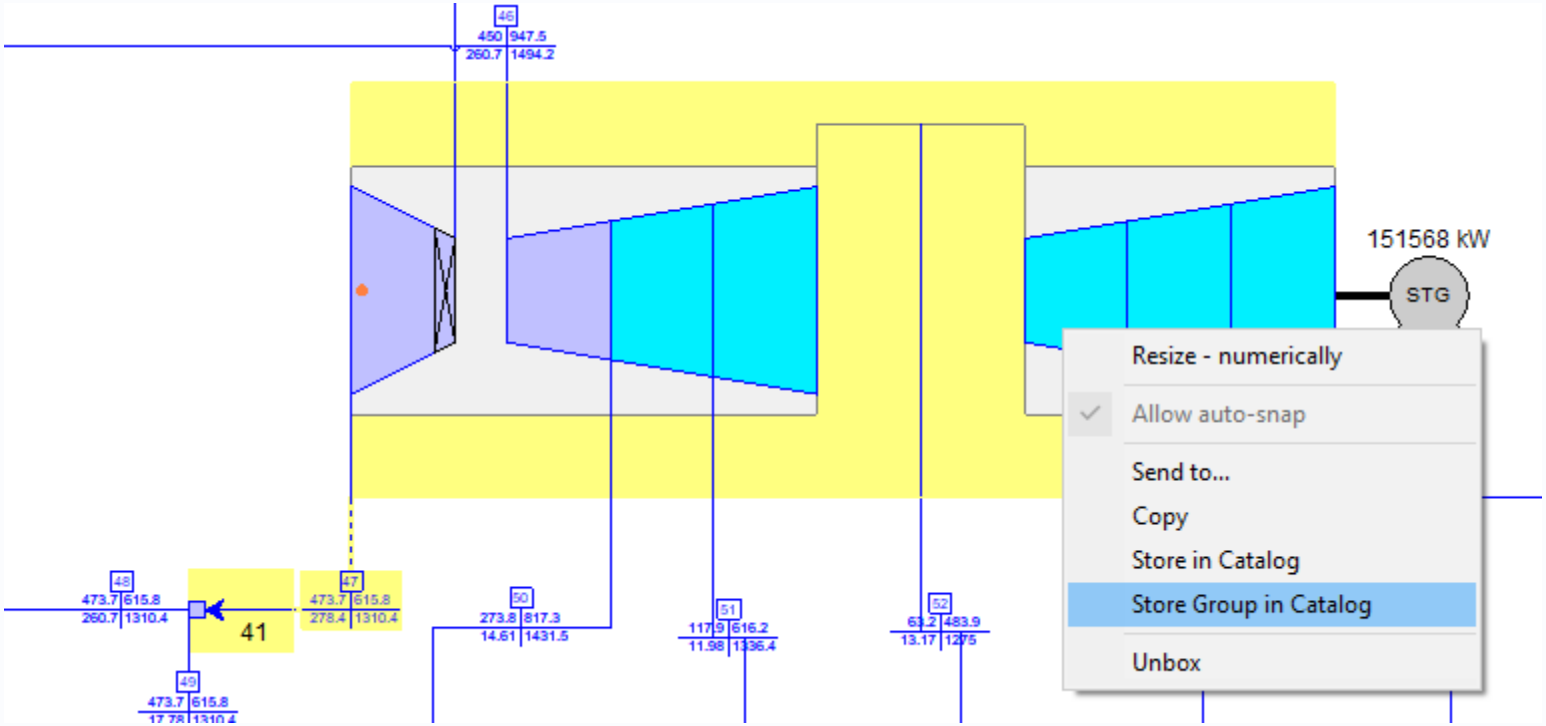
This leaves you with the task of implementing the vendor's design of the steam turbine, merging it with your developing model.



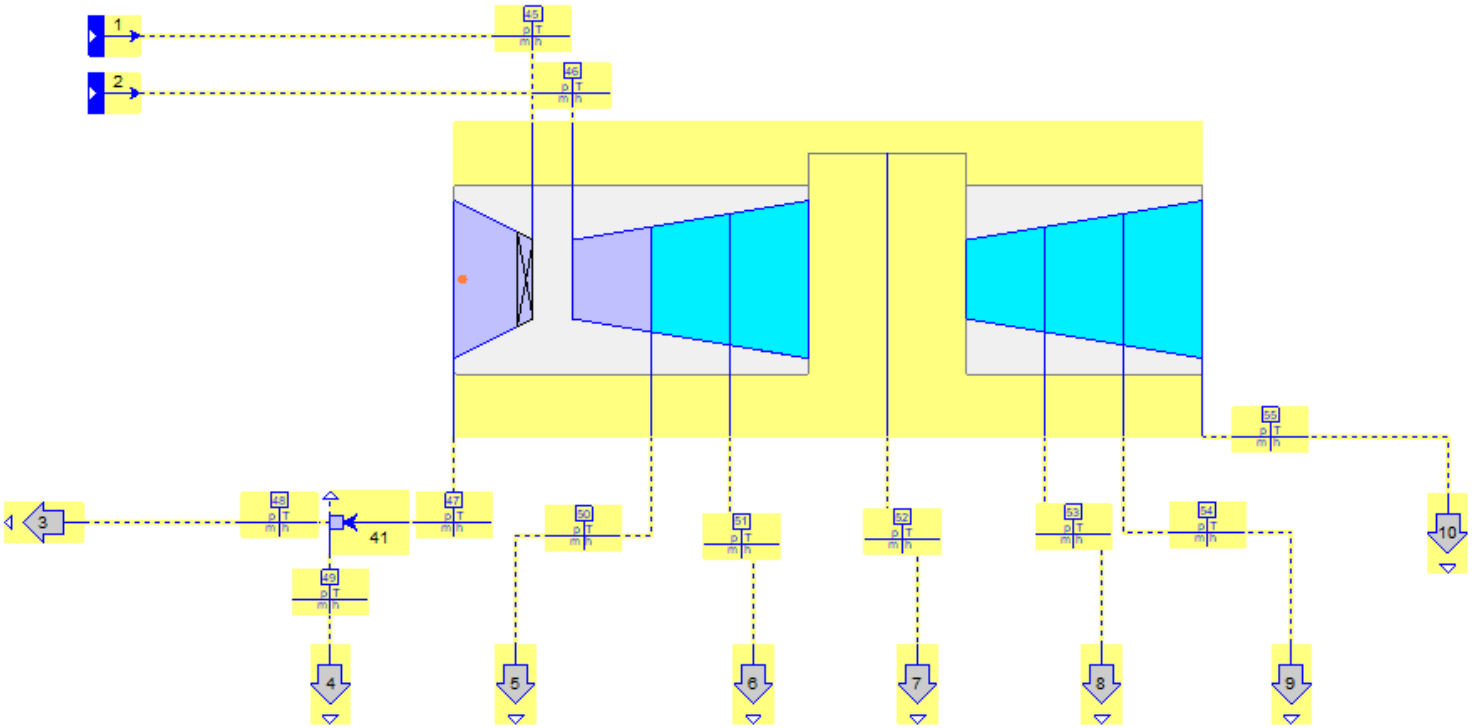
Adjusting in place leaves a lot of potential conflicts to be wrestled with. The recommended procedure is to make a copy of the subsystem, adjust it all by itself, then bring it back, as an already-designed, finished product in Off-Design.

You could copy to a new file or flowsheet directly, or place a copy in a Catalog.



Copied ST and Splitter 41 to "SolarST_plus"

An advantage of the Catalog is that, when you import that stored sub-model to a new file, it brings with it a full complement of associated elements to support the sub-model on its own.



Opened a new TFX file and selected "SolarST_plus" from Catalog. It comes equipped with Sources and Processes as supporting elements.

The Steps Involved…

- Isolate in a flowsheet free from network. I've chosen to push to and pull from a Catalog

- Impose incoming flow conditions, outgoing pressures and flows, check leakages if known, check overall flow match
- Impose whatever's needed for pressure match
- Set efficiencies or exit enthalpies, set known or assumed exhaust loss

- If all the above is done right, any small remaining disparity in power is due to generator or mechanical losses.

- Convert to Off-Design, compute, then copy modified model back to main flowsheet.

Final Results