SNAP Overview

PRESENTED BY

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Introduce SNAP

- A breakdown of the Model Editor Graphical User Interface (GUI)
- Discuss the various tools (Job Status, Configuration Tool)
- General discussion of functionality regarding MELCOR

Demonstrate user input workflow

- MELGEN and MELCOR
  - General "Packages" are maintained
  - General User Guide information is accessible

Demonstrate job submittal

Simplistic Idea on Information Flow for Job Submittal

From a simple user's understanding of information flow
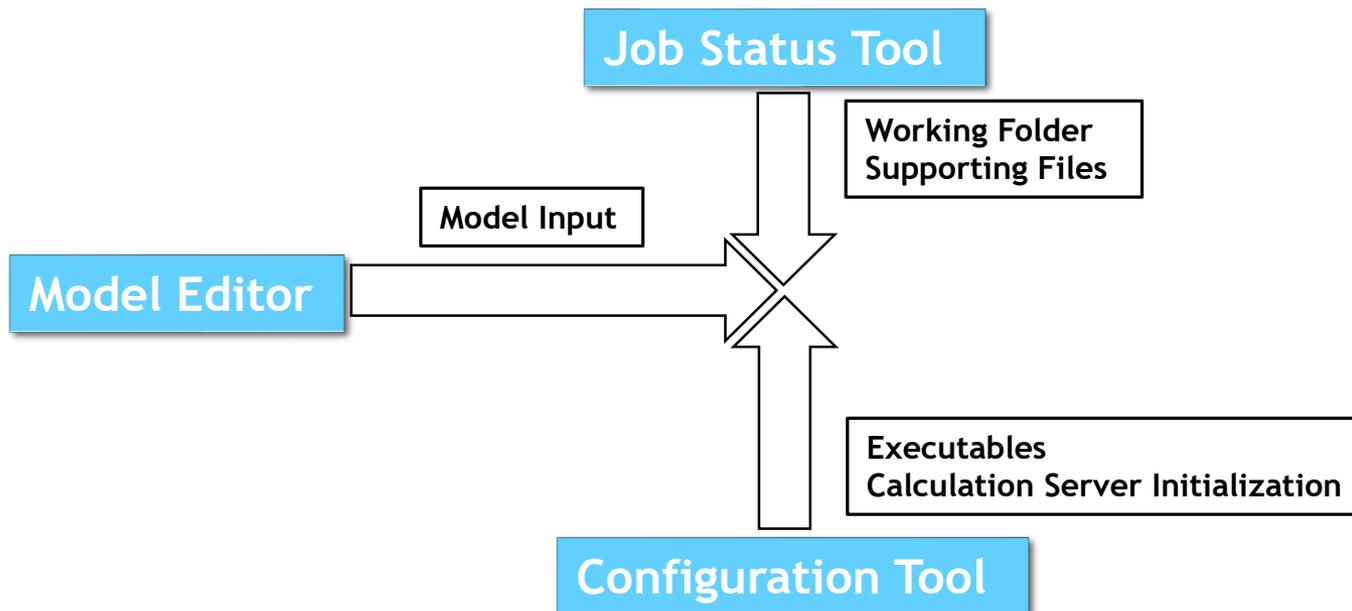
Model Editor

- Unique plug-ins handle specific model details for a given code (MELCOR, RELAP, etc.)
- Stores both MELGEN and/or MELCOR user input
- Can convert older MELGEN/MELCOR 1.86 input to 2.x
- Submits input processed by executables (i.e. job submittals)
- Can create an Animation Model for post processing output

Model Editor Advanced

- User Defined Numerics
- Engineering Template
- Automated Validation Framework
- And more….

Model Editor Interface

Nodal based tree for each package

- Blue node can be clicked to expand the tree
- Select the MELCOR component to view its properties in the Property view (Components can be selected in either the Navigator or the View port.)
- Packages with different names
  - Model/Options == EXEC package
  - Control Systems == CF/EDF/TF packages
- Internal Controls
  - Cases – Where the MELCOR input is treated
  - Job Streams – Identifies MELCOR input files and executables using an information flow map
  - Connections – list component dependencies
  - Numerics – user defined substitutions to input
  - Views – List and management of views available in the View port

Sub-Systems allows user input to be grouped logically into system sets

- Components can be added to a sub-system from the currently available component
- Exporting a text files will maintain sub-systems in independent files (a typical practice for MELCOR file organization where components are stored in unique files)
  - Example
    - RHR components may include
      - Pumps, reservoir water sources, heat exchangers, etc.
      - Their associated flow paths, controls volumes, controlling logic are often kept primarily in one input file to facilitate input deck development, review, debugging, and maintenance.

Multiple models can be open in one SNAP instance

◦ Accordion Display
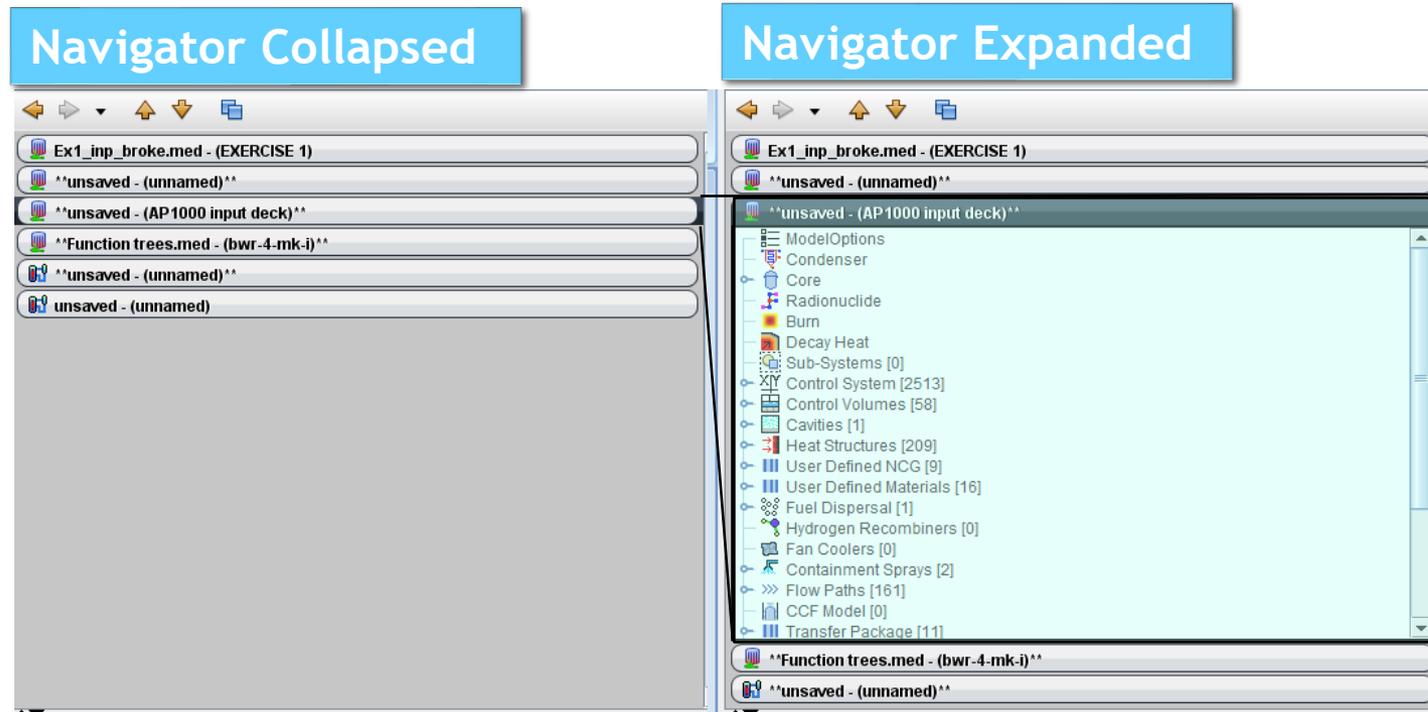
Properties View

- Where all user input is accepted
  - Both MELCOR and/or SNAP components
- Editable fields
- Drop down menu
- Editable window pop-ups
- Selectable elements
- Model notes
- User guidance

Message

- Where error messages associated with SNAP are placed.
- MELCOR error messages are still written to the MELCOR files
  - Message file, diagnostic file, output file, etc.

New Views are created in the Navigator tree

- Right click View, select new to create a new view component

View components have several internal drawing methods for various components

- Components can be placed in the view by right clicking on the component(2) in the navigator tree and selecting add to view
  - They can also be dragged to the ViewPort but the visual representation may be different.
- Control Volumes utilize the CV_VAT information (Volume and Altitude Table) when determining the depiction
- Flow paths utilize Connections (see Navigator tree) to determine which Control Volumes to connect. Location of the connecting line is taken from the FL_FT record versus the CV_VAT input
- Core, Control Functions, Database Variables, etc.

Important: 'Deleting' the visual representation of an object in the View Port deletes the object from the input. 'Cutting' removes only the visual representation.

View Port Toolbar
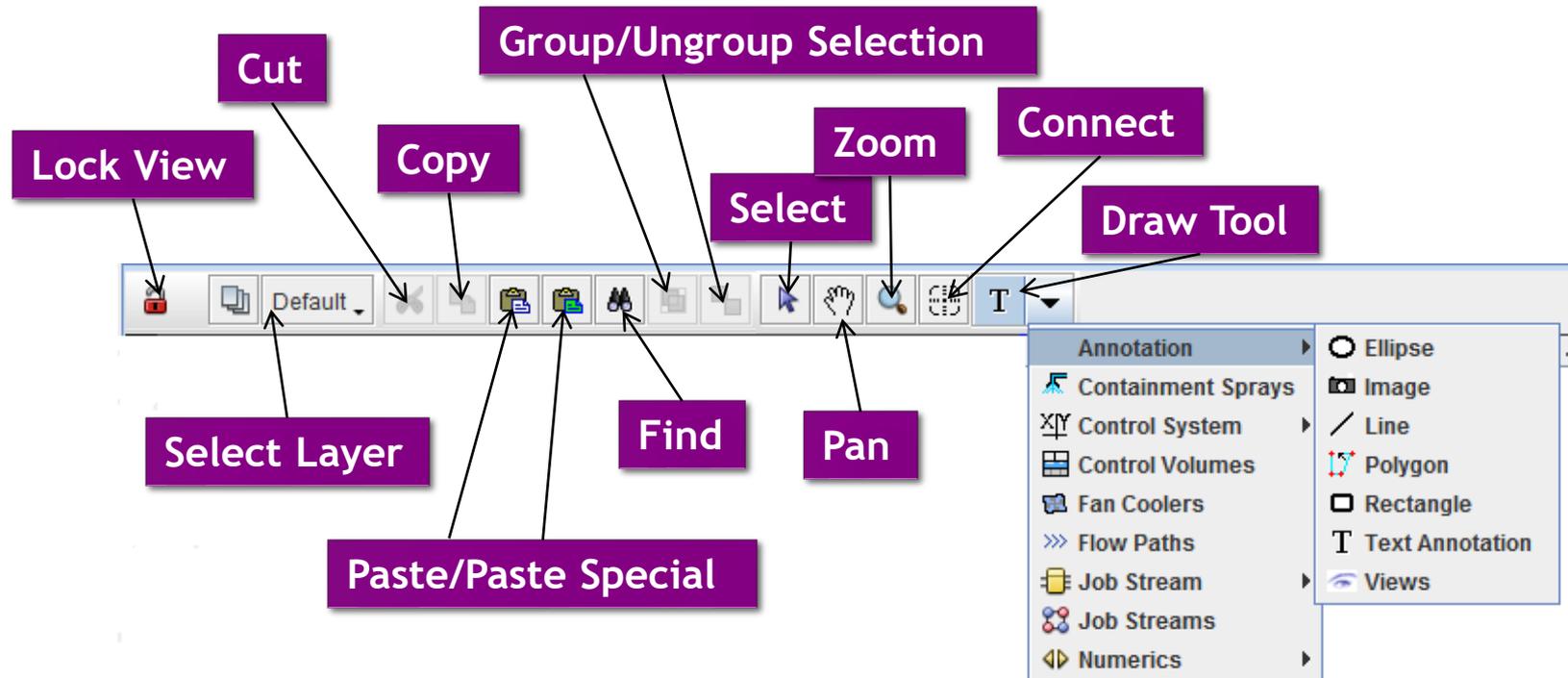
Further Discussion of ViewPort with Animations

Importing a pre-existing MELCOR model
- File > Import > MELGEN 2X
  - Make sure the Code Version is correct
  - Select the root file
    - Note R*I*F or INCLUDE files are read with regard to their hosting file not the main root file. (MELCOR performs these functions with regard to the root file only.)
      - Hosting file is the file with the R*I*F or INCLUDE file location
      - Root file has the main MELGEN or MELCOR block
      - Include block names have caused issues in the past. If nothing imports try adjusting the block names to remedy issue. Remove quotes, spaces, etc.
  - Name options can be specified by the user
    - Preserve existing component names as reasonable (16 character limit and repeated names will have an _# appended to the end of the name)
    - Generate with number
      - With package prefix i.e. CV###
      - Without prefix i.e. #####

Example: Import MELCOR File

Within the Navigator Tree
- Add a Case if none exists (right click case select new)
  - This will create a MELCOR Case
  - Case may already be imported if MELCOR date resides in same file as MELGEN
- Clear messages in message view prior to importing . Any error message should be carefully addressed.
- Right Click the newly created MELCOR Case and select Import Case
- Navigate to file location
  - If error Messages are overwhelming
    - The "Code Version" didn't match the file type
      - 1.86 vs 2.x mismatch

Review the Message View for import errors
- May require some corrections
- Once again if the error messages are overwhelming
  - 1.86 vs 2.x mismatch likely occurred

Import the MELCOR case BEFORE changing the "Code Flavor" i.e. from 1.86 to 2.x or reverse
- SNAP is anticipating like versions

MELCOR Navigator Tree

MELCOR input is stored under Cases in the MELGEN navigator tree

To see the MELCOR input right click on one of the MELCOR inputs under Cases and select Edit Case

A new MELCOR Navigator Tree will be created

Similar to the MELGEN Navigator Tree, under Model/Option you can convert the code flavor or makes changes to the MELCOR input.

NOTE: Code Flavor found in the MELGEN Navigator Tree under Cases->MELCOR, DOES NOT DO ANYTHING. See for your self by changing the value.

MELCOR Navigator Tree

General Use

- Lets SNAP know where the executables are located
  - MELGEN/MELCOR
  - APT Plot (Not necessary but useful for Post Processing)
- Initiates the Calculation Server
  - Calculation Server is where the calculations are performed
  - By default your current machine is assumed to be the calculation server
    - Therefore if your machine is the one to perform the calculations you will not need to adjust this setting
    - You may want to set Maximum Concurrent Jobs
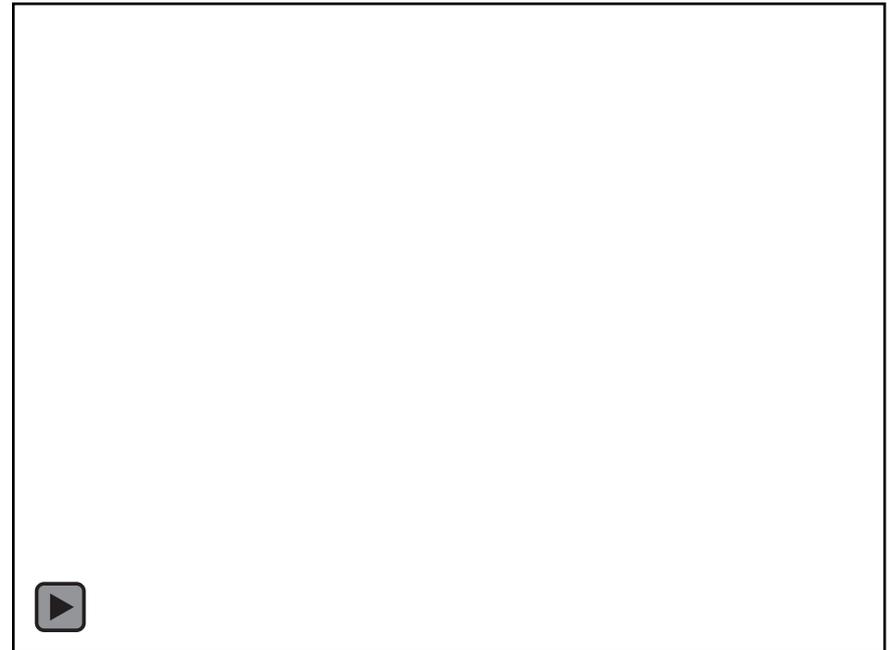
Job Status Tool

Job Status Tool

- Keeps track of prior performed jobs
- Only displays the folder list and jobs when the Calculation Server has been started

User will need to create a working folder
- Right click Local > Mount Root Folder
- Specify the working folder

Job Streams can be submitted to any mounted root folder
- The files submitted and produced by MELGEN and MELCOR will be located in \Root Folder\Job Stream Name

From an existing Job
- Files associated with the run can be viewed with the Job Status Tool
- Data can be plotted with APT Plot from the Job Status Tool
- Jobs viewable from the Job Status Tool will be available for post processing with an Animation Model from the Model Editor

Importing a Standalone Job with the Job Status Tool

- The Job must reside in a folder within the working directory of a mounted Root Folder
- Navigate down to the folder where the Job files reside
- Right click the folder>Import Completed Job
- Select the applicable application
- Click Next then input a Job Name if desired
- Click Next then select the location of all desired files
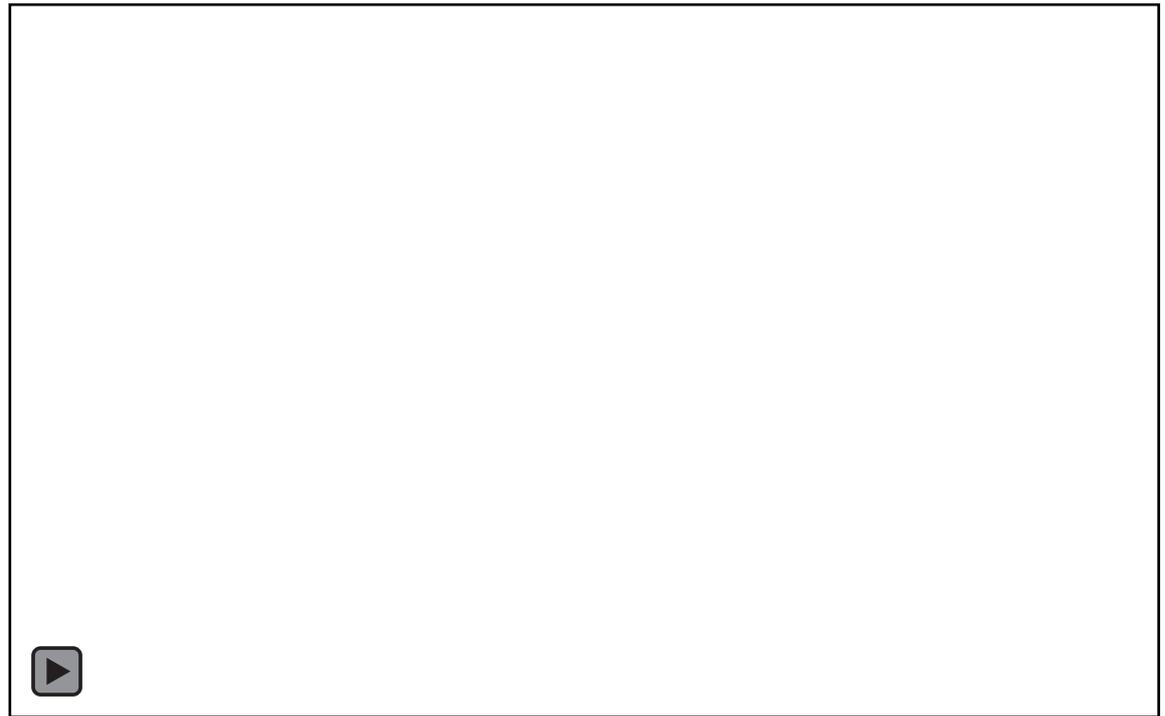
Job Stream

- Created within the Model Editor
- Performs MELGEN and/or MELCOR runs
  - Can be either or both
- Submits the input files to the MELGEN/MELCOR executables and specifies the folder where the results will be placed
- Produces a new Job within the Job Status Tool
- Can specify the post processing tool to generate a set of plots
- Has several default Job Streams which can be selected to simplify the setup process

Setting Up a Job Stream

Checklist before setting up a Job Stream

- MELGEN/MELCOR executables setup in the Configuration Tool
- Calculation Server started
- Root Folder present in the Job Status Tool where the resulting files will be located

Set-up

- In the Navigator right click Job Streams>New
- Select Basic Stream
- Select calculation type (Two-Step)
- A new View will be created containing an information flow diagram
  - The MELGEN input and MELCOR input will be present
  - A MELGEN and MELCOR executable will be selected from the Configuration Tool automatically