DSATools™
Dynamic Security Assessment Software

Powertech

WECC MVS Updates

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http://www.powertechlabs.com
http://www.dsatools.com

Releases

- Major release (v24.0) on **July 17, 2024**
- Targeting next minor release (v24.1) **late November**
- Release schedule:
  - From v22 onward transitioned to scheduled releases (3 minor releases/year, e.g., v22.1, v22.2, v22.3, 1 major release e.g. v23)
  - Minor releases will generally include fixes/model support/small enhancement requests, major release cycle for public release of more significant features
- Presentation focused on TSAT (SSAT/VSAT/PSAT updates not included unless there is overlap with TSAT)

TSAT – Recent Enhancements – Model Support

- Added since v23 release (Jul 2023):
  esdc1c,esdc2c,esdc4c,esst1c,esst5c,esst6c,pss7c,reec_d,wtgp_b,wtgt_b,DC4C,DC4CU1,REECC1,USAC6AU,PSS7C

- IEEE 421.5 Type C implementation

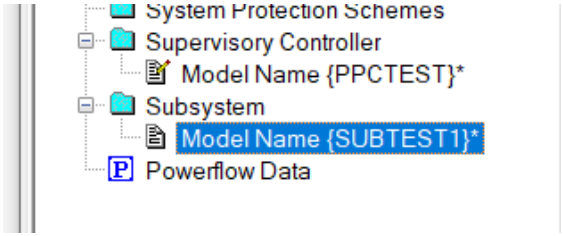
  - All Priority 1-3 (95%)
  - Priority 4-5 about 75% complete

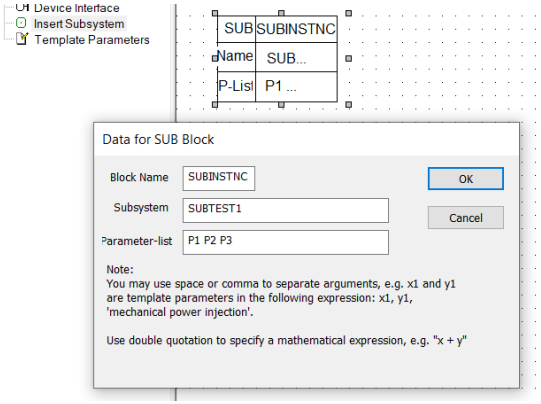
- Latest approved generic renewables supported incl. REGFM_A1, REGFM_B1

  - Note: Some available as template library on request or in DSATools-format instantiation only (some models now have PSS/E and PSLF instantiation support)

TSAT – Recent Enhancements - User-Defined Modeling (UDMs)

- Support for parameterized “subsystems” in AC User Defined models, which can be re-used/called from other models





- Support for IEC 61400-27-1 format DLL interface (automatic wrapper generation, similar to support added for IEEE/CIGRE v1.1 method)

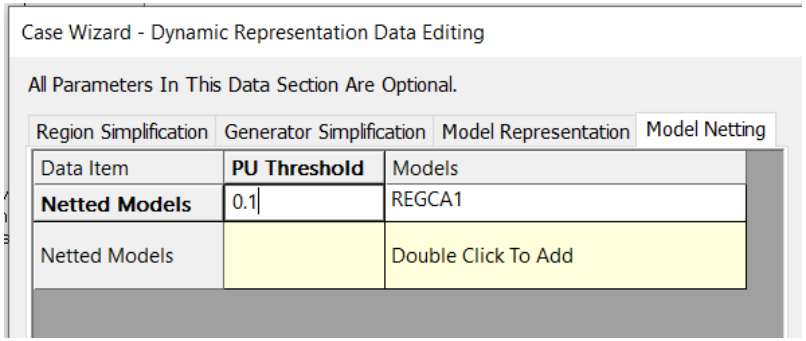
- Ramp tracking filter block added to standard control block library (no internal)

- New remote monitoring quantities available:
  - Branch MVA
  - Branch (and interface) To-side quantities, as well as flag for indicating metered end
  - Transformer ratio and phase angle

- Encrypted-UDM block monitor supression

TSAT – Recent Enhancements – Dynamic Representation

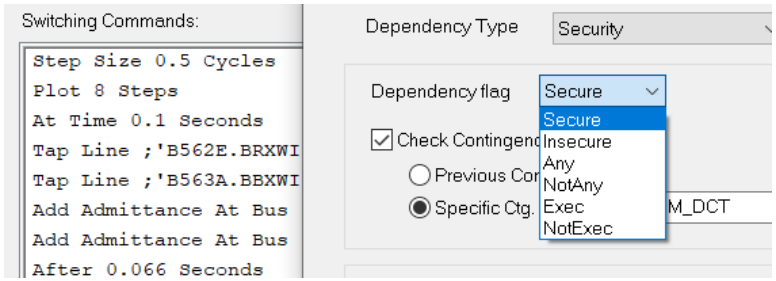
- Dynamic representation changes (dynamic representation is used in TSAT+SSAT to simplify/remove dynamics of a region by area, zone, bus, or by model type)
  - Model-output dependent dynamic representation (model netting based on pu output)

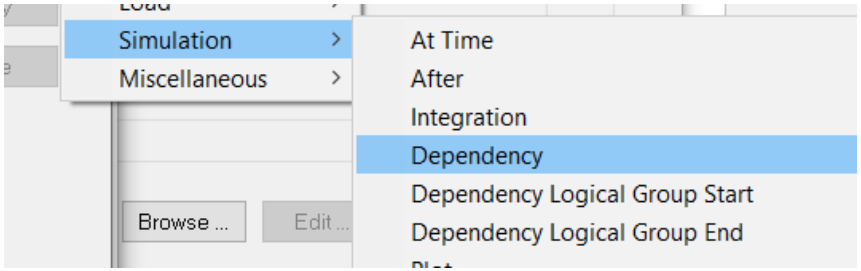


  - Model-based netting according to custom instantiation model names (e.g. use PSS/E or PSLF model name)
  - Auto-ignore protection models if generator simplification changes unit to infinite bus
- Better support for “equipment name” format in dynamic representation GUI editor

TSAT – Recent Enhancements - Contingencies

- Dependency logic





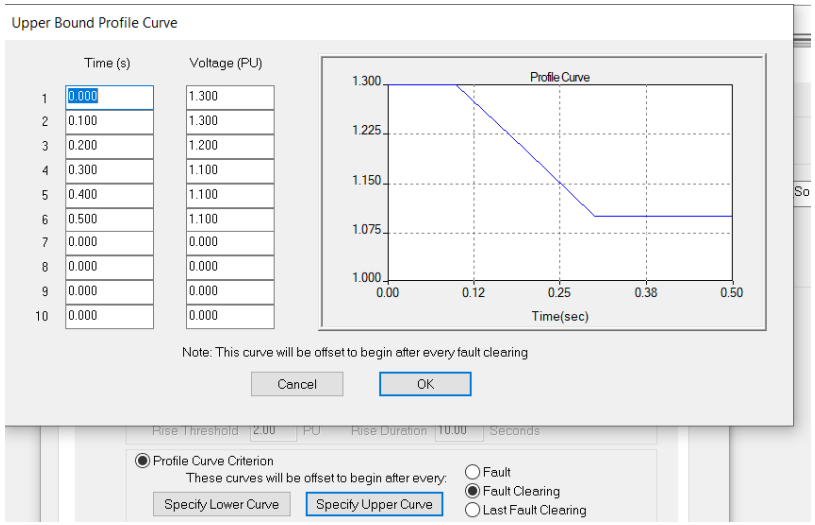
  - Logic groups to allow dependencies to be AND'ed, OR'ed, or NOT'ed
  - False flag to force a dependency to be evaluated as False
  - Exec and NotExec flags to check if contingency has been executed as part of a dependency (in addition to contingency security or topology dependencies)
  - Flags for real-time and forecast mode in Online DSA

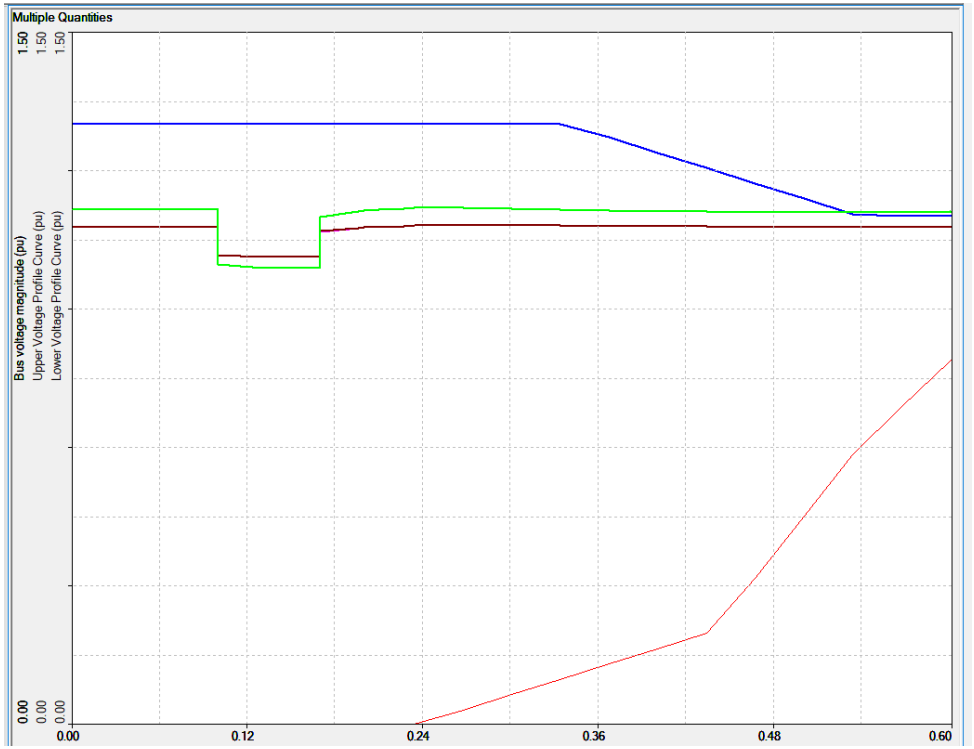
- Point-in-time powerflow snapshot will include equipment names in output data (in addition to bus numbers, etc.) when available

TSAT – Recent Enhancements – Stability Criteria

- Additional ROCOF calculation methodology selectable ("Head-Tail" option with configurable time window)

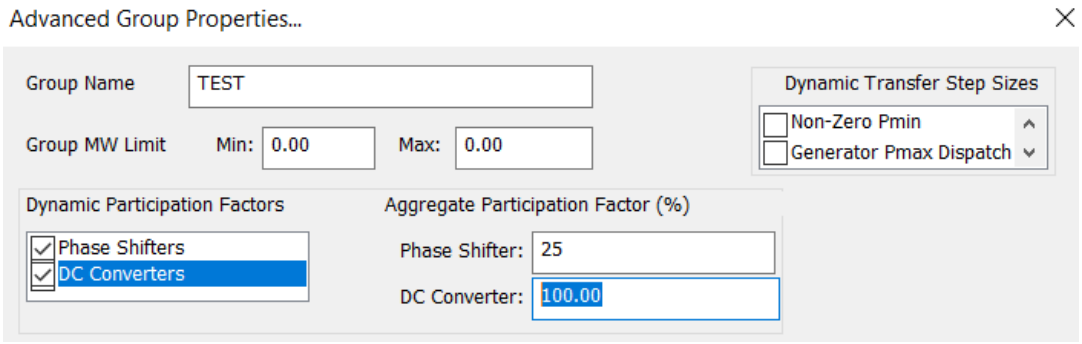
- Custom transient voltage/frequency curves will be recorded to output binary file (for plotting directly against monitored quantities)





TSAT – Recent Enhancements – Transfers / Limit Search

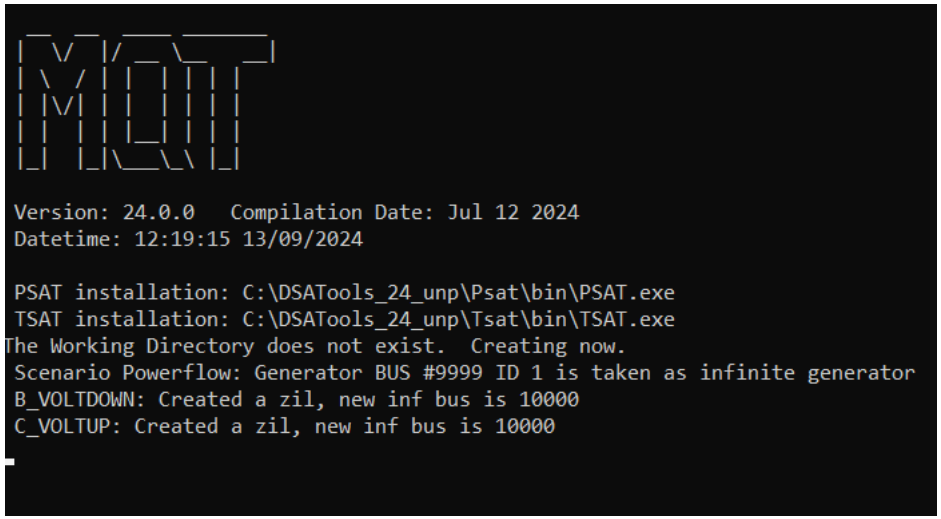
- Additional configurability for phase shifters and DC links:
  - Can set participation factor percentage to “auto” to adjust according to base point (will allocate MW setpoint change to individual PSTs or HVDC converters according to total % of MW step specified as aggregate participation factor)
  - Option to have phase shifters and DC converters adjust participation factor to preserve their % of total MW step (aggregate %) as individual devices in group hit their limits

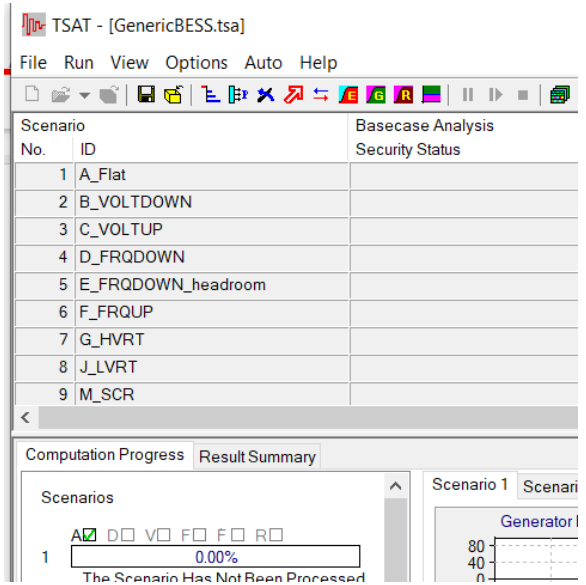


- In TSAT, (when dynamic step size feature enabled) power limit search threshold can drop as low as 0.1 MW (previously 5 MW) to ensure that specific transfer points where individual units in a generator schedule group hit their Pmax or Pmin and it is evaluated in the limit search

TSAT – Recent Enhancements – Model Quality Testing

- TSAT MQT tool now included as an accessory module in v24.0





- Similar approach to DMVIEW - automatic case preparation for TSAT based on user-specified input files (e.g. LVRT/HVRT curves)
  - Some automatic powerflow modification (i.e. for leading/lagging tests) and detection for case setup (e.g. POI detection)
- Initial version is command line tool, includes example cases – examples set up MQT cases according to ERCOT requirements

TSAT – Recent Enhancements - Misc

- Increased # of dynamic files supported within a scenario to 100
- XML output tallies total MW/MVA for generator tripping within a given contingency simulation
- Further fixes to help with client issues with interference from anti-malware/anti-virus scanners
- “Always use local drive for working files” option – prevents trying to read/write temporary or swap files to network when running a case from network drive
- No disturbance/flat run testing mode in TSAT will summarize MW/MVAr variations across generators (instead of just speed)

Contact Info

- General Inquiries
  - Contact Powertech Lab's DSATools team at dsainfo@powertechlabs.com
- DSATools™ Website

  www.dsatools.com