

The purpose of this document is to record what was done to enable the exciter PST model to use the structured global variable g and other ‘clean up’ actions taken.

Each paragraph describes the required changes to the PST file.

Initial globals:

```
%% Original globals block condensed into g...
%% excitation system variables - 63
global exc_con exc_pot n_exc
global Efd V_R V_A V_As R_f V_FB V_TR V_B
global dEfd dV_R dV_As dR_f dV_TR
global exc_sig % pm_sig n_pm % not related to exciters?
global smp_idx n_smp dc_idx n_dc dc2_idx n_dc2 st3_idx n_st3;
global smppi_idx n_smpsi smppi_TR smppi_TR_idx smppi_no_TR_idx ;
global smp_TA smp_TA_idx smp_noTA_idx smp_TB smp_TB_idx smp_noTB_idx;
global smp_TR smp_TR_idx smp_no_TR_idx ;
global dc_TA dc_TA_idx dc_noTR_idx dc_TB dc_TB_idx dc_noTB_idx;
global dc_TE dc_TE_idx dc_noTE_idx;
global dc_TF dc_TF_idx dc_TR dc_TR_idx
global st3_TA st3_TA_idx st3_noTA_idx st3_TB st3_TB_idx st3_noTB_idx;
global st3_TR st3_TR_idx st3_noTR_idx;
```

Modified globals:

```
global g
% as g.exc.
```

exc_idx

- functionalized, removed dummy return value
- addition of n_dc1 and related variables to global
- prepended g.exc. to old globals

handleNewGlobals.m

- added if statement to check for exc_con

s_simu_Batch.m

- prepended g.exc. to zero initialization of states and derivatives, integrations
- Removed bus input to smmpex, smppi, exc_st3, and exc_dc12

smpexc

- Changed three instances of dEFD to dEfd
- prepended g.exc. to relevant exciter globals.
- replaced length = 0 checks with isempty calls
- removed bus input and f output (unused)
- commented out calculations and definitions not used in function

smppi

- Changed three instances of dEFD to dEfd
- prepended g.exc. to relevant exciter globals.
- removed bus input and f output (unused)
- commented out calculations and definitions not used in function

exc_st3

- Fix of exc_con(i,4) == 1; % reset to 1 to single =
- replacement of length checks to isempty checks
- prepended g.exc. to relevant exciter globals.
- removed bus input and f output (unused)
- commented out calculations and definitions not used in function

exc_dc12

- Fix of exc_con(i,4) == 1; % reset to 1 to single =
- fix of g.exc.exc_con(g.exc.dc_idx(no_KA),4) = ones(length(no_KA),1); % to single =
- prepended g.exc. to relevant exciter globals.
- removed bus input and f output (unused)
- commented out calculations and definitions not used in function

svm_mgen_Batch

- Prepend g.exc. to exciter check, infinite bus exciter removal, exciter count check, state counts, zero creations, second state initialization, b matrix transforms,
- Removed bus input to smmpex, smppi, exc_st3, and exc_dc12

mexc_sig

- removal of t input (k only input)

nm_if

- removal of dummy return from exciter functions
- alteration of inputs to accommodate cleaned up functions

ns_file Should be functionalized... (?)

- addition of g.exc. to globals for state counting, .

p_file Should be functionalized...

- addition of g.exc. to relevant globals.
- addition of g.exc. to d_vector indexing

p_cont Should be functionalized...

- addition of g.exc. to exciter disturbance c state.

p_exc

- Addition of g.exc. to related variables for perturbances

p_file Should be functionalized...

- addition of g.exc. to exciter state reset

p_m_file Should be functionalized...

- addition of g.exc. to exciter state counts and associated variable logic checks