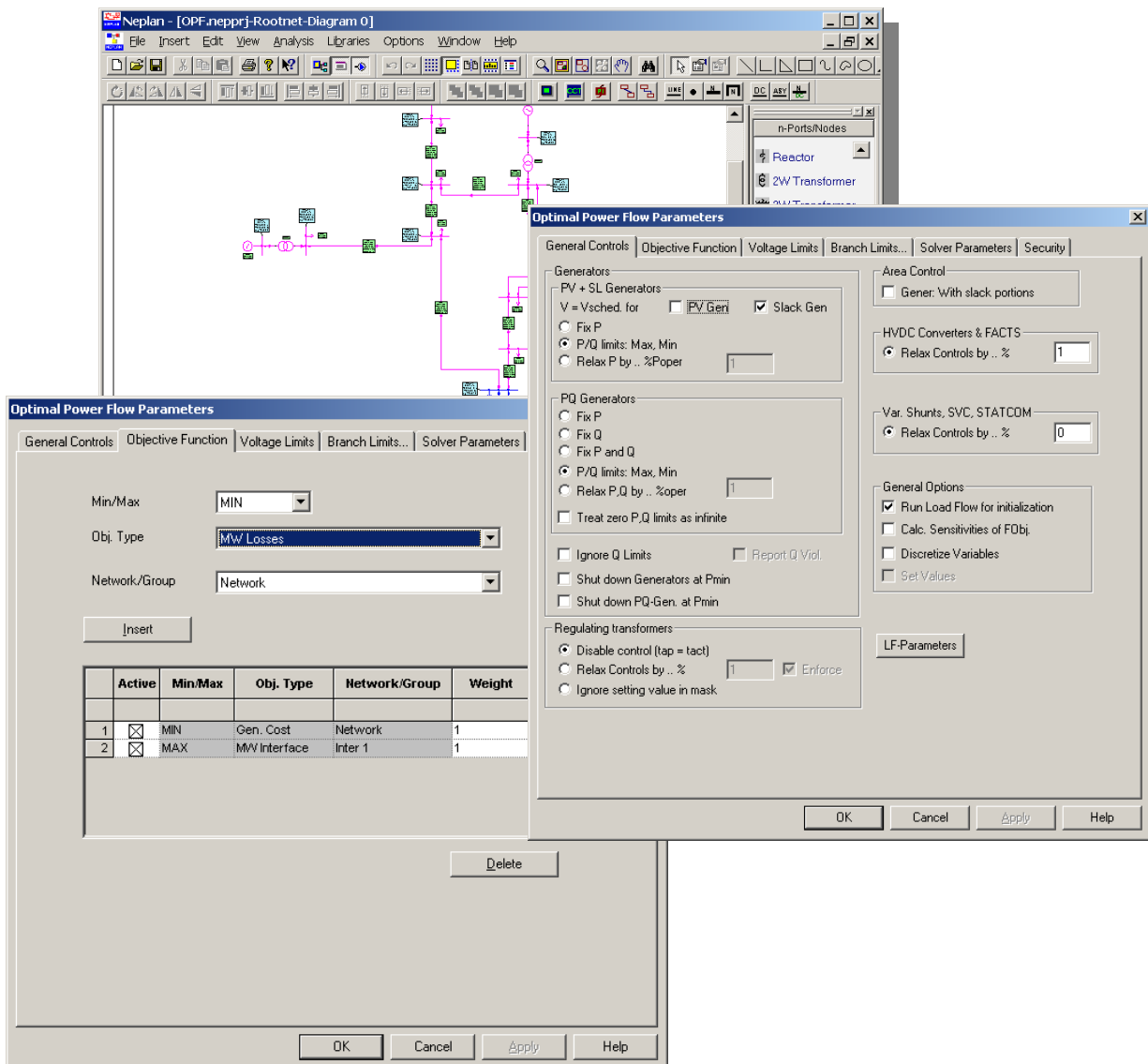


General Characteristics

- Control variables: active / reactive power generation, schedule voltages of generators and taps of ULTC-transformers, reference values of HVDC systems and FACTS (UPFC, STATCOM, SVC, TCSC)
- Variable limits for bus voltages, branch loadings, active and reactive power of generators
- Individual or general limits, 'consider/not consider' limits function
- Objective function: apply to whole network / to a certain area or zone, minimize / maximize MW losses, Mvar losses, generation cost, MW import or Mvar import, MW Interface flow
- Multi objective function is possible (use of weighting factors)
- Security constrained optimization (with n-1 contingency constraints)



Results

- Automatic display of results.
- Optimization results (binding constraints, variables at limits, lambda multipliers, sensitivities, network controls, coloring of limiting network elements in the graphic)
- 'Move' and 'Delete' function for result boxes.
- Self-defined result output: the user can select items, units, font, precision, placement.
- Overloaded elements or nodes with voltages outside predefined limits are highlighted.
- Line thickness corresponds to element loading.
- Results can be saved in a text file (ASCII)
- Table output: for the whole network, individually for each area / zone. Listing of power flows between area/zones, overloaded elements, sorting function, selective output.
- Table interface with MS-Excel

The screenshot displays the NEPLAN software interface during an Optimal Power Flow (OPF) analysis. On the left, the 'OPF Results' dialog box is open, showing options to 'Show Variables at Limit', 'Show Binding Constraints', and 'Show Network Controls'. It also includes a 'Color Variables at limit' section with checkboxes for 'Control Variables' and 'State Variables', and buttons for 'Show With OPF Coloring' and 'Undo OPF Coloring'. The main window shows a network diagram with nodes and lines. A table titled 'Element Results' is overlaid on the bottom right, showing power flow data for various elements. Below the dialog, a summary table shows power loss and generation data for different areas/zones.

To	P Loss	Q Loss	P Imp	Q Imp	P Gen	Q Gen	P Load	Q Load	Qc S
Area/Zone	MW	MVar	MW	MVar	MW	MVar	MW	MVar	M
	7.554	-274.595	59.02	-3.094	808.554	190.405	801	465	0
	3.766	-156.221	65.551	17.186	444.215	126.593	506	300	0

ID	Name	U	u	U ang	P Load	Q Load	P Gen	Q Gen	Q Shunt
		kV	%	°	MW	MVar	MW	MVar	MVar
25	NO_1	20.4	102	5.3	0	0	284.218	66.301	0
9	NO_10	215.026	97.74	-7.1	60	30	0	0	-4

ID	Node	Element	Type	P	Q	I	Angle I	Loa
	name	name		MW	Mvar	kA	°	
12	149	NO_12	EL13	-20.855	-11.491	0.064	142.9	0
13	153	NO_12	EL14	28.776	7.593	0.08	-23.1	0
14	157	NO_12	EL15	28.776	7.593	0.08	-23.1	0
15	413	NO_12	LO_12	8	2	0.022	-22.3	0
16	141	NO_13	EL11	-60.749	-13.557	0.166	159.9	0
17	145	NO_13	EL12	44.749	3.557	0.12	-12.1	0
18	404	NO_13	LO_13	16	10	0.05	-39.5	0
19	133	NO_14	EL9	-49.603	-12.825	0.134	162.7	0
20	137	NO_14	EL10	-49.603	-12.825	0.134	162.7	0
21	141	NO_14	EL11	61.205	5.651	0.16	-8.1	0
22	403	NO_14	LO_14	38	20	0.112	-30.6	0