TARA – <u>T</u>ransmission <u>A</u>dequacy & <u>R</u>eliability <u>A</u>ssessment

TARA is a transmission planning software tool with modeling capabilities and analytical applications that extend beyond traditional power flow solution. Using extraordinarily robust and speedy linear (DC) and non-linear (AC) power flow calculations, TARA integrates data checking, reliability analysis, transfer limit calculation, preventive dispatch, critical facility identification, and region specific tools for generation deliverability and reserve requirements analysis.

Unique ability to read, analyze and document multiple power flow cases

Innovative grid applications powered by fast and robust power flow methods

In addition to a large number of reports on input data checking, validation, and analysis, TARA provides innovative means of exploring network connectivity and status. Outputs are in the form of Excel reports with many supplementary analysis functions available via right-mouse-click functionality. Data or network status can be displayed on interactively created one-line diagrams. Input cases parameters may be modified, including topology and dispatch, using spreadsheet based data editors or optimized results; revised cases are immediately available for analysis and reporting. The impressive array of TARA features and applications also includes:

✓ Non-linear (AC) and linear (DC) power flow, N-1 and N-1-1 contingency analysis
✓ Unique tools to validate data integrity and handle errors in input files
✓ Security constrained redispatch capabilities (including PARs)
✓ Thermal and voltage transfer limits analysis by conventional proportional or maximum MW transfer methods
✓ Generator (DFAX) and outage event (LODF) distribution factors analysis

TARA provides standard & advanced planning functions, as well as customized complex analytical applications

TARA's optional security-constrained dispatch functions consist of two calculation modes, security constrained economic dispatch (SCED) and security constrained redispatch (SCRD). The SCED module develops a dispatch schedule with minimum generation production cost while enforcing a full set of N-1 contingency analysis constraints in preventive mode. The SCRD module does not consider economics; rather, it minimizes dispatch changes from the initial schedule, such that N-1 overloads are relieved.

Other TARA built-in analytical applications are AC transfer limit analysis, N-1-1 analysis with integrated preventive mode optimal redispatch, and comprehensive flowgate screening. This last capability allows for the development of customized applications such as deliverability methodologies used in various regions.

TARA's core functionality is greatly expanded by its optional modules. TARA Outage Reliability Analyzer (ORA) performs comparative AC or DC contingency analysis to determine system impacts due to transmission and generation outages. SCRD calculations are integrated to provide preventive mode generator dispatch for contingency conditions. TARA Automated Model Builder (AMB) uses NERC SDX information or EMS data to build successions of fully detailed Eastern Interconnection cases representing future time periods.

Optional TARA modules for outage reliability analysis (ORA) and automated model building (AMB)

In summary, the key aspects of TARA are:

✓ Extraordinarily robust and speedy power flow calculations
✓ Array of transmission planning analysis functions, using both linear (DC) and non-linear (AC) solutions
✓ Customized analytical applications, including generation capacity deliverability analysis
✓ Optional optimization, outage reliability analysis (ORA) and automated model builder (AMB) functions

PowerGEM / TARA Software