

## GE Multi-Area Reliability Simulation Software Program (MARS)

Accurate generation system reliability assessment for ensuring system adequacy to satisfy customer load demand

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### Is your generation system reliable?

In today's energy industry where participants and their roles are in a constant state of flux, having the ability to quickly and accurately assess the reliability of generation systems is more important than ever. The Multi-Area Reliability Simulation software program (MARS) enables quick and accurate assessment of the reliability of a generation system comprised of any number of interconnected areas. Accurate system assessment is crucial for ensuring the adequacy of the system in terms of satisfying future load demand.

### MARS software puts your system's reliability to the test

MARS software is a system simulation program that models the generation system, the interconnections between areas, and the chronological hourly load demand. MARS software models the system in great detail with accurate recognition of random events such as equipment failures, as well as deterministic rules and policies that govern system operation. MARS software can model any number of areas and pools to study multi-area issues such as:

- generation system adequacy
- installed capacity requirements
- benefits of reserve sharing
- need for implementing emergency operating procedures
- reliability impact and capacity value of variable resources such as wind and solar.

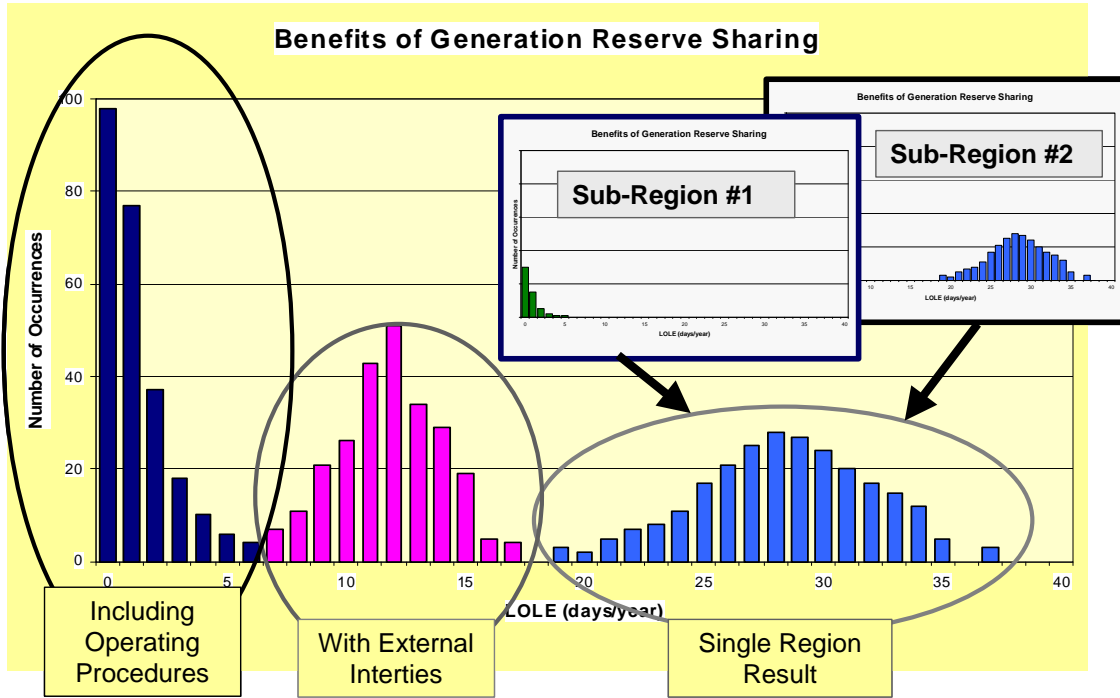
A sequential Monte Carlo simulation forms the basis for MARS software. The Monte Carlo method provides a fast, versatile, and easily expandable program that can be used to fully model various generation and reserve sharing options.

MARS software has the capability to model the following different types of resources, such as thermal, energy-limited (hydro), and variable resources (wind, solar, etc.)

MARS software makes the following reliability indices available on both an isolated (zero ties between areas) and interconnected (using the input transfer limits between areas) basis:

- Daily LOLE (loss-of-load expectation) (days/year)
- Hourly LOLE (hours/year)
- LOEE (loss-of-energy expectation) (MWh/year)
- Frequency of outage (outages/year)
- Duration of outage (hours/outage)
- Need for initiating emergency operating procedures (days/year and hours/year)





*Multi-Area Reliability Analysis Allows Identification of Location Specific Reliability Differences*

There are various ways to tap the benefits of MARS software

MARS software is available for installation on in-house computing systems through a software licensing agreement with GE Energy. The program's benefits can also be accessed through contract studies performed by GE Energy's Energy Applications and Systems Engineering personnel in Schenectady, New York.

Who needs MARS software?

Power developers, electric utilities, utility planners, financiers, and economic and regulatory consulting firms all can benefit from the system reliability information accessed through MARS software.

Who to contact

For more information on MARS software contact:

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