

SUPPORT ENTERPRISE MODEL (SEM)

A Logistics Modeling, Analysis, and Decision Support Tool

Highlights

What does SEM Enable?

- Provides integrated modeling of supply chain and repair chain activities for a worldwide support system.
- Logistics modeling, analysis, optimization, and decision support of global operations.
- Calculates system and support structure performance and cost metrics while accounting for uncertainty.
- Spares inventory and resource optimization on a global scale.

Why is SEM Important?

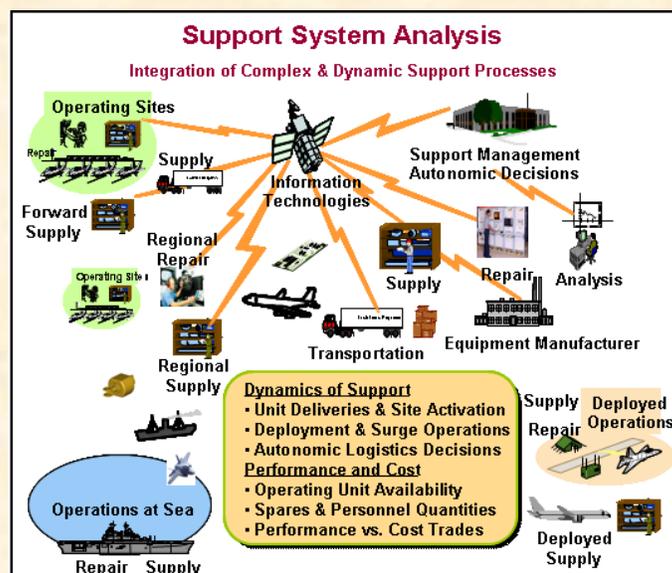
- Provides comprehensive, detailed modeling of supply chains, repair chains, inventory management and maintenance activities.
- Details the management of resources and forecasts optimal operations as an enterprise grows.
- Links sustainment system performance to readiness.

Example Applications

- Enterprise operations performance analysis
- Analysis to identify key variables with respect to enterprise performance
- Resource and support equipment utilization studies
- Mission readiness assessments
- Applicable in industries as diverse as defense, energy, aviation, healthcare, and many others
- Performance Based Logistics (PBL) analysis

SEM Overview

The Support Enterprise Model is a discrete event simulation tool designed to model and simulate operation and support activities of a worldwide sustainment system. The general objective of SEM is to help characterize the sustainment system performance including supply, repair, and manufacturing activities over the entire life of the enterprise. To accomplish this objective the user defines and executes SEM simulations to generate statistical results characterizing the enterprise operations using different notional support and sustainment options. Results of those simulations are analyzed to make recommendations for best-case logistics system configurations that support required system mission capable rate at the lowest possible cost.



SUPPORT ENTERPRISE MODEL (SEM)

Key Features

Integrated Modeling of Worldwide Support System

- Supply chain, repair chain, manufacturing, and transportation processes.
- Part storage and inventory management.
- Support equipment and personnel usage.
- Maintenance and repair of support equipment.
- Part repair and part production activities at Original Equipment Manufacturers (OEM).
- Impact of Prognostics and Health Management (PHM) and support equipment reliability on sustainment system performance.

Analysis of Dynamic Changes Throughout the Life-Cycle

- System delivery schedules with fleet build-up and retirement.
- Site activations and closures.
- Varying schedules of demand generation.
- Transitions from normal to surge operations.
- Changes in inventory controls, quantities, and locations of resources.

Analysis of Enterprise Performance, Resource Requirements, and Costs

- Mission Capable Rate and Readiness.
- Mission success probabilities.
- Supply fill rates and response times.
- Spares, personnel, support equipment, and transportation requirements.
- Cost indicators for investments and operating costs.



Key Benefits

Provides Sophisticated Analytic Capabilities

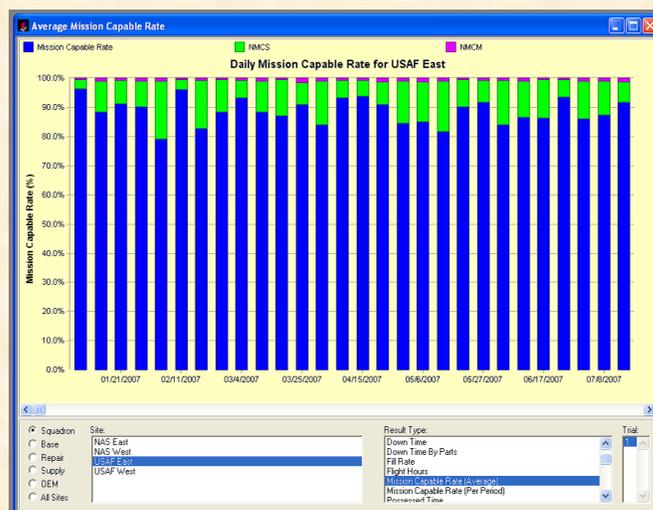
- Measure performance effectiveness based on multiple trials to quantify uncertainty.
- Robust decision support tool for evaluating operational supply chain, repair chain, and system maintenance activities.
- Simulation results assist the user in identifying support system limitations and analyzing enterprise performance.

Characterizes the Impacts of Changes in:

- Enterprise architecture
- Processes & business rules
- Equipment reliability and maintainability characteristics
- Equipment usage
- Personnel staffing levels

Portable and Flexible Computational Capability

- SEM operates on standard desktop personal computers with a Windows® operating system to permit widespread distribution among potential users.
- SEM easily integrates with Microsoft® Office tools such as Excel and Access.



Bruce Thompson, CSR Program Lead
Phone: (505) 284-4949, Email: bmthomp@sandia.gov

Website: reliability.sandia.gov

