

NESSUS[®]
PROBABILISTIC ANALYSIS SOFTWARE

Code Capabilities. NESSUS is a computer program employing state-of-the-art methods for performing probabilistic analysis of structural/mechanical systems. NESSUS can be used to: assess component/system reliability, identify important random variables, provide information for risk-based decision analysis and reliability-based optimization, and develop designs that are more cost-effective and reliable than those developed using traditional deterministic design methods. A summary of the capabilities of NESSUS is included on the next page.

Pricing and Technical Support. An Annual License for usage of NESSUS is \$4,000.00. A Perpetual License for usage of NESSUS is \$10,000.00. An annual maintenance is required to receive updates and support following the first year of the Perpetual License. The cost of the Annual Maintenance Agreement is \$1,500.00 per year and is payable on the anniversary date of the Perpetual License. An annual license may be converted to a perpetual license on the expiration date by paying the balance for a perpetual license (\$6,000) plus the maintenance (\$1,500). Unlimited department-wide academic licenses are available for \$500.00 annually based on a single point of contact. Site licenses are also available with a base price of \$25,000. Technical support is limited to code usage, software patches, and periodic enhancement updates during the active license. Engineering technical support may be acquired from SwRI. Source code for user-programmable routines is included. Prices or terms may change without notice.

Supported Operating Systems. NESSUS is available for Windows, Linux, and Mac OS X. Contact SwRI for other system availability.

Multiple Installations. The Annual License for usage allows NESSUS to be executed on one computer accessed from one site. Installations to execute NESSUS on additional computers or from additional sites will be licensed at the same price as the first installation. Site licenses are also available.

Installation. A graphical installation program is used to guide the user or system administrator during the installation of NESSUS on all platforms. If necessary, SwRI will assist with the installation.

Summary of NESSUS[®] Capabilities

Version 9.1, January 2010

Probabilistic Analysis Methods

First-order reliability method (FORM)
Second-order reliability method (SORM)
Mean-value (MV)
Advanced Mean Value (AMV, AMV+)
Response Surface Method (RSM)
Monte Carlo simulation (MC)
Latin hypercube simulation (LHS)
Sphere-based importance sampling (ISAMF)
Adaptive importance sampling (AIS1,AIS2)
Hybrid probabilistic method (AMV+/AIS2)
Probabilistic fault-tree Analysis (PFTA)
Efficient global reliability analysis (EGRA)
Importance sampling at MPP (ISMPP)
Gaussian process RSM (GPRSM)
Mean-value based probability contouring

Deterministic Analysis Capabilities

Parameter variation analysis
Design of Experiments (DOE)

Performance Functions

Analytical (user-subroutine or direct input)

Numerical (ABAQUS, ANSYS, DYNA, LS-DYNA, MADYMO, MATLAB, NASGRO, MSC.NASTRAN, User-defined, WCN, etc.)

Linked model capability that allows any general combination of the above

Inputs

Full featured graphical interface
Free-format keyword interface
17 probability density functions
Correlated random variables
Random variable parameter uncertainties

Outputs

Full cumulative distribution function
Probability of failure for given performance
Performance for given reliability
Probabilistic sensitivities (3 types)
Confidence bounds (2 Methods)

Documentation

Users' Manual
Theoretical Manual

Operating Systems

Windows XP/Vista/7
Linux
Mac OS X
Contact SwRI for other system availability