



# Provably-Correct Software: Using “Coverage” And Other Techniques To Improve Application Quality

by: Richard Jacik

Tuesday, March 27<sup>th</sup>, 2007

**The American Society for Quality (ASQ) — Washington, DC & Maryland Metro Section  
Software Special Interest Group (SSIG)**

Coverage techniques embrace a spectrum of statistical formative and summative models for evaluating the quality of a testing process and of test cases with the by-product of actually being useful in proving the “correctness” of the software being tested. That is, proving your test cases can prove your software, and doing so isn’t as computably impossible as once thought. Even if 100% provability isn’t a short- or long-term goal, coverage testing provides useful tools, models, and standards for

1. Measurably improving the quality of test cases
2. Removing test cases that don’t “add-value”
3. Measurably improving the quality of the tested product

Taken with other techniques and approaches coverage models may be the best hope for measurably improving software that starts out “less than perfect” but ends up “close to perfect”. More widely leveraged in the aerospace and real-time system methodologies, coverage statistics and models are potentially more useful in interactive and information system development efforts. Additional statistical models like mutation and static abstract interpretation will also be discussed; along with some industry case study information, benchmarks and some low-barrier ways to start implementing a coverage philosophy.

Presenter: **Richard Jacik** is an independent consultant, entrepreneur, and a board member at Information Methodologies, Inc., one of three companies he helped to create. He has spent the last twenty years learning, doing, and teaching IT at public and private organizations around the world on projects as small as 3 people and as large as 300. He writes and speaks on a variety of topics including IT Organization Development, IT Strategy & Planning, Software Quality & Process Improvement, and Information Security. A programmer by trade, Mr. Jacik consults with CIOs, CEOs, and CFOs on improving IT’s ROI and on maximizing value from investments in process frameworks like CMMI, ITIL, and ISO900X.

Mr. Jacik received his Master’s in Computer Science and his graduate certificate in Software Systems Engineering from George Mason University and his B.Sc. in Mathematics from Kent State University.

**This Meeting Will Be Held at 3 Locations!**

MITRE, room 1N100  
7515 Colshire Drive  
McLean, VA 22102

MITRE, room 1002  
260 Industrial Way West  
Eatontown, NJ 07724

MITRE, room 1M306  
202 Burlington Rd. (Rt. 62)  
Bedford, MA 01730

**The three locations will be linked using video tele-conferencing (VTC) facilities.**

**Sponsored By:** The American Society for Quality (ASQ), Washington DC & Maryland Metro Section (509), Software Special Interest Group (SSIG). Members of the ASQ SSIG include software quality professionals, software engineers, and others interested in applying quality principles to the field of software development. See our web page: <http://www.asq509.org/ht/d/sp/i/2499/pid/2499>  
We meet every month, usually at the MITRE facility in Tyson's Corner, Virginia, with VTC to other locations. If you can host another location via VTC, please contact Scott Ankrum.

**Registration:**

Please register for the meeting by COB Monday, March 26, 2007 by contacting Scott Ankrum at [ankrums@mitre.org](mailto:ankrums@mitre.org) or 703-983-6127 for the Virginia and Massachusetts sites, or contact Richard Eng at 732-578-6352 or [reng@mitre.com](mailto:reng@mitre.com) for Eatontown, NJ. Please include your company affiliation, your citizenship, and the location you plan to attend. You do not need to be an ASQ member to attend.

There is no cost to attend. Pizza and soda will be served.

**The Meeting Is Scheduled For:**

Tuesday, March 27<sup>th</sup>, 2007  
6:30 - 7:00 Pizza and Sodas  
**New time!** 7:00 - 8:00 Program

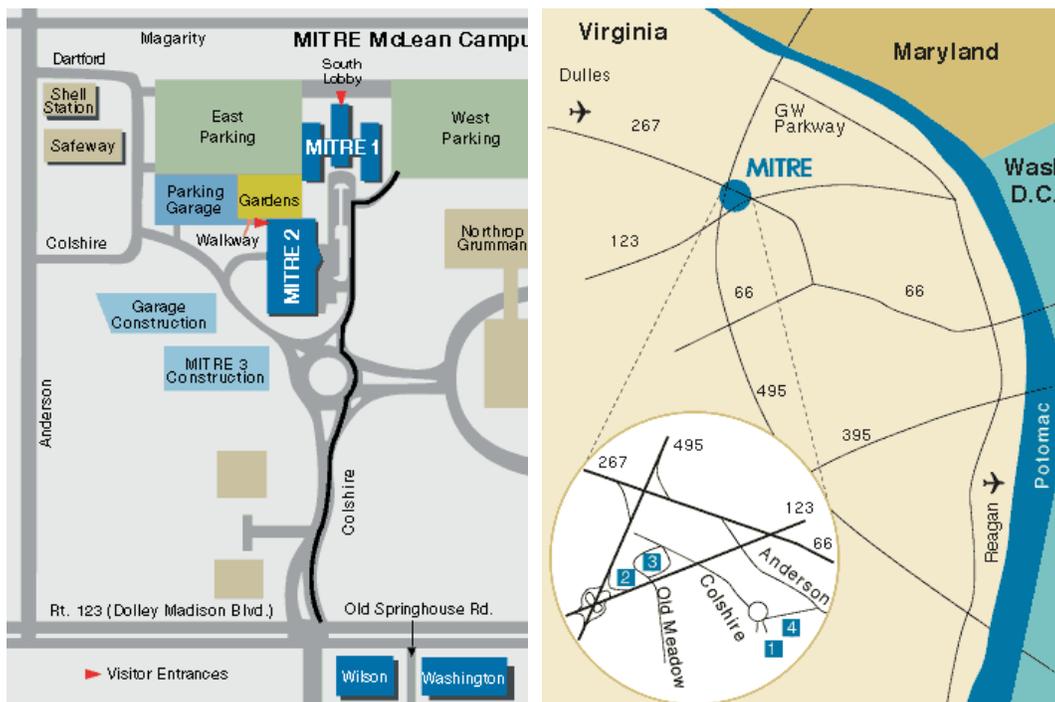
**Will Be Held At:**

MITRE building 2 room 0N136, Mclean, VA  
MITRE room 1002, Eatontown, NJ  
MITRE building M room 1M306, Bedford, MA

If you cannot be at any of these locations, ask about the telephone conference call number.

**Directions to the MITRE Facility in McLean, Virginia:**

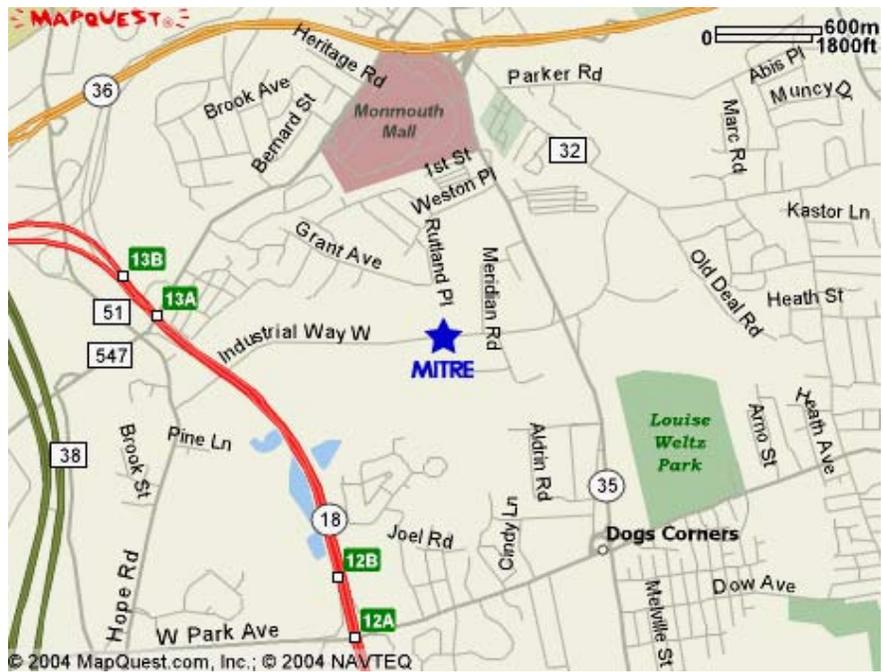
Take the Beltway, I-495 to Virginia. Take Exit 46B (McLean, Route 123). Take Route 123 North, (also called Dolley Madison Blvd.) and go to the second traffic light at Colshire Drive. Turn right on Colshire Drive and continue through circle on Colshire. Drive around the back of the building to the East (left) parking lot. The entrance is past the fountain, on the left. Additional directions can be found at: [http://www.mitre.org/about/locations/mitre1\\_map.html](http://www.mitre.org/about/locations/mitre1_map.html)



## Directions to the MITRE Facility in Eatontown, New Jersey:

### From the New Jersey Turnpike

If traveling from the **SOUTH**, get off the Turnpike at Exit 7A (195 toward Shore Points). Take 195 East towards the ocean and shortly after 195 turns into Route 138 (approximately 35 miles) watch for Route 18 North (Eatontown). Take Route 18 North to Exit 13A (Wayside West/Wyckoff Road). At end of ramp, bear left. At first traffic light (Hope Road) make a left turn. Make second left turn onto Industrial Way. The MITRE Corporation is next to the First Atlantic Credit Union on the left hand side of Industrial Way. There is a MITRE sign out front.



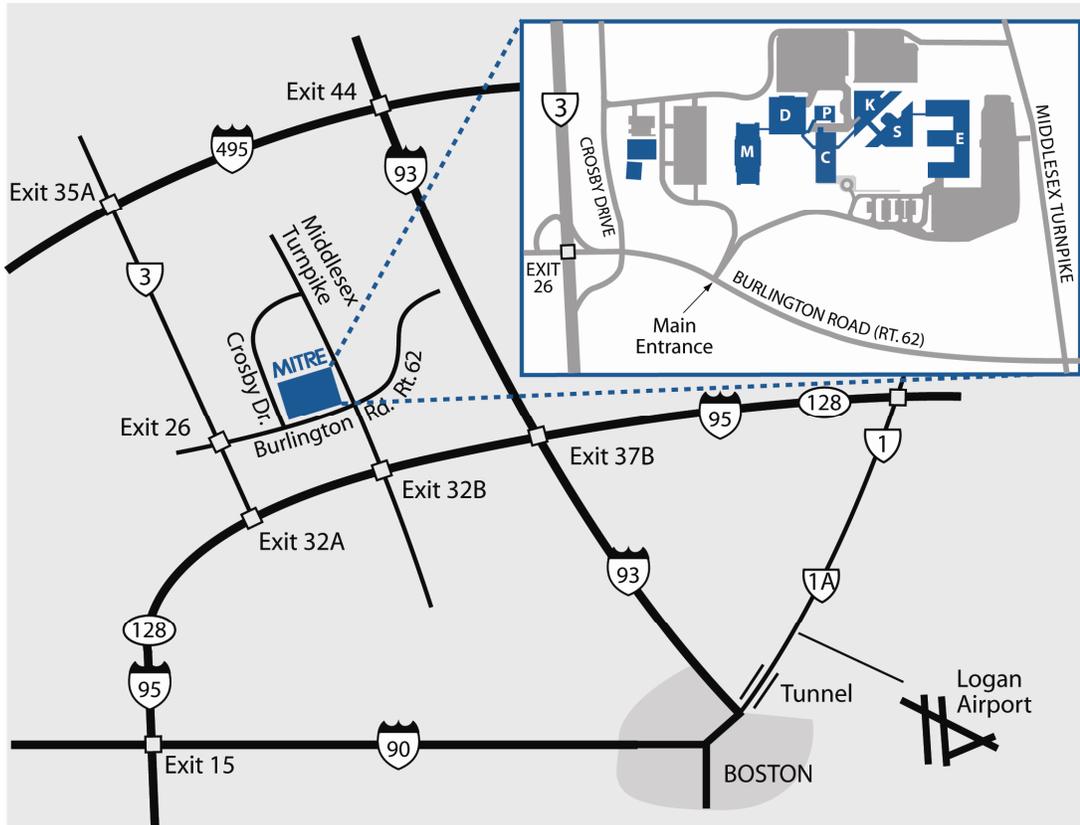
There are two buildings on the left side of Industrial Way. The first building is MITRE, the second building is TYCO. Take a left turn into the parking lot of the first building, which is MITRE.

If traveling from the **NORTH**, get off the Turnpike at Exit 11 (Garden State parkway exit). Follow the Garden State Parkway until Exit 105 (Eatontown). Follow the directions from the Garden State Parkway below.

**From the Garden State Parkway:** Follow the Garden State Parkway from the North or from the South to Exit 105 (the exit numbers increase going from south to north). After paying the toll at Exit 105, make first right turn onto Hope Road. Follow Hope Road to Industrial Way (second left turn after crossing Wyckoff/Shafto Road). Make second left turn onto Industrial Way. The MITRE Corporation is next to the First Atlantic Credit Union on the left hand side of Industrial Way. There is a MITRE sign out front. There are two white buildings on the left side of Industrial Way. The first building is MITRE, the second building is TYCO. Take a left turn into the parking lot of the first building, which is MITRE.

When you are facing the front of the MITRE building, the entrance to the ASQ meeting will be from the left parking lot opposite First Atlantic bank. Follow the signs to the conference room.

## Directions to the MITRE complex in Bedford, Massachusetts:



### From New Hampshire to MITRE Complex:

Take Route 3 South to Exit 26 (Route 62)

Turn Left on Route 62. It is a short distance to the MITRE entrance on left--watch for building directories on MITRE grounds

### From Manchester Airport (NH) to MITRE Complex:

Start out going West on Airport Rd. toward parking

Turn slight right onto Brown Ave/NH-3A

Merge onto NH-101 West via the ramp on the left toward Bedford/Nashua

Take the Everett Turnpike South exit toward Merrimack/Nashua

Merge onto Everett Turnpike (toll road)

Everett Turnpike becomes US-3 South

Take exit 26 (Route 62) toward Bedford/Burlington

Turn Left onto (Route 62) Burlington Road

At second set of traffic lights, turn left at MITRE Bedford Campus entrance--watch for building directories on MITRE grounds.

### Logan Airport to MITRE Complex:

Exit airport towards Route 1A South/Sumner Tunnel (I-93) Boston.

Proceed through tunnel towards Storrow Drive (I-93 North).

Take I-93 North eleven miles to Exit 37B (Route 128 (I-95) South).

Take Route 128 (I-95) South six miles to Exit 32A.

Take Exit 32A, and proceed on Route 3 North.

Take Route 3 North for two miles to Exit 26 (Route 62).

Bear right on Route 62.

Take Route 62 a short distance to the MITRE Bedford Campus entrance on left--watch for building directories on MITRE grounds.