Structured Assurance Cases:
Three Common Standards

by: T. Scott Ankrum,
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American Society for Quality (ASQ) — Section 509 — Software Special Interest Group (SSIG)

For safety-, mission-, or security-critical systems, there are typically regulations or acquisition guidelines requiring a documented body of evidence to provide a compelling justification that the system satisfies specified critical properties. Current frameworks suggest the detailed outline of the final product but leave the truly meaningful and challenging aspects of arguing assurance to the developers and reviewers. They provide the developer no assistance in maintaining the assurance case, nor do they assist the acquirer or certifier in identifying what has changed and needs to be reexamined.

This talk describes work of the Structured Assurance research task, which was performed over a two year period as part of the High Confidence Software Initiative. Alfred H. Kromholz, of MITRE assisted in the work and co-authored the paper upon which this presentation is based.

We began with two major hypotheses. We selected a software notation suitable for building structured safety cases and applied it to three disparate assurance standards. Each of the three standard mapping efforts is discussed, along with the problems we encountered. In addition to the standards, we used the notation to structure an assurance case for a practical security-critical system, and we describe the lessons learned from that experience. We conclude with practical options for using our mappings of the standards and how well our initial hypotheses are borne out by the project.

Presenter: T. Scott Ankrum is a Senior Software Systems Engineer at the MITRE Corporation. Mr. Ankrum is working in software development process improvement and assessment for agencies in the Army and the Department of Homeland security. He led the Assurance Frameworks research task, which was part of the High Confidence Software research project at MITRE. Mr. Ankrum has been a project manager, software designer and developer and has more than 30 years of experience in many aspects of computing, from mainframe systems to distributed systems development and client/server design. He has managed projects and led development teams, and has been personally involved in software development from requirements definition to final testing. He holds a Master of Software Engineering degree from the University of Maryland and a B.S. degree in Computer Science from American University. He is the chairman of the Washington, DC section of the American Society for Quality (ASQ) and the chairman of its Software SIG, a member of the Association for Computing Machinery (ACM), the IEEE, the IEEE Computer Society, and the IEEE Standards Association.

This Meeting Will Be Held at 3 Locations!

The MITRE Corporation	FDA Tech. Center	The MITRE Corporation
7515 Colshire Drive	16071-B Industrial Drive	260 Industrial Way West
McLean, VA	Gaithersburg, Maryland	Eatontown, NJ 07724

Driving directions and maps for all three facilities are provided below. There will be two-way video-audio conferencing between the locations. All locations will have food. Please indicate which location you will be attending when you register.

Sponsored By: The American Society for Quality (ASQ) Section 509 (Washington, DC), 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/Items/cat_id/530/pid/192
We meet every other month, at the FDA Tech Center near Gaithersburg, Maryland and/or the MITRE facility in Tyson's Corner, Virginia.

Registration:
Please register for the meeting by COB Monday, January 23, 2006 by contacting Scott Ankrum at ankrums@mitre.org or 703-983-6127. Please include your company affiliation, your citizenship, and at which 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:	**Will Be Held At:**
Wednesday, January 25, 2006	MITRE building 2, Mclean, VA
6:30 - 7:30 Pizza and Sodas	MITRE Eatonton, NJ
7:30 - 8:30 Program	FDA Tech. Center, Gaithersburg

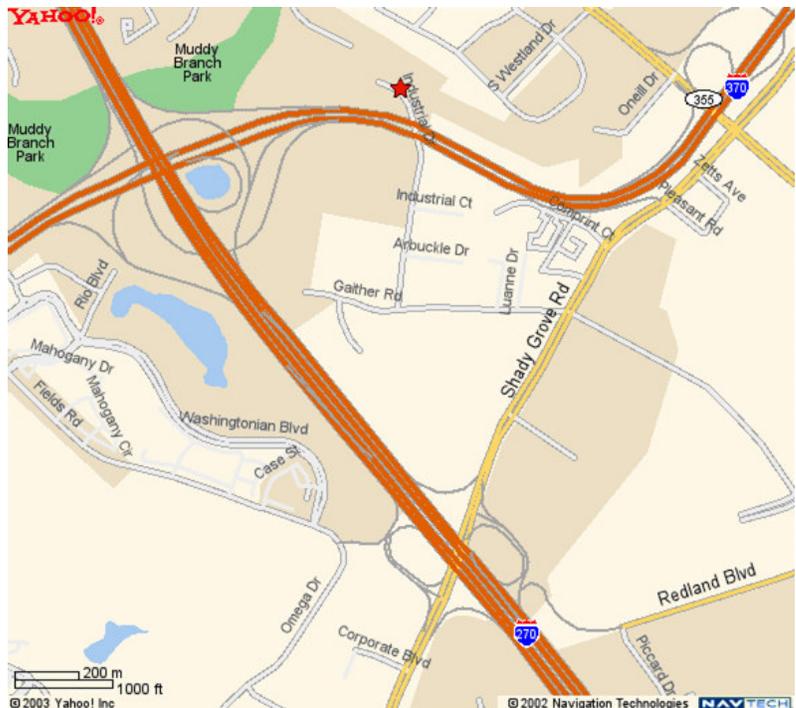**Directions to the MITRE Facility in McLean, Virginia:**
Take the Beltway, I-495 to Virginia. Take Exit 46B (McLean, Route 123). Take Route 123 North, (also called Dolley Madison Blvd.) and go to the second traffic light at Colshire Drive. Turn right on Colshire Drive and continue through circle on 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
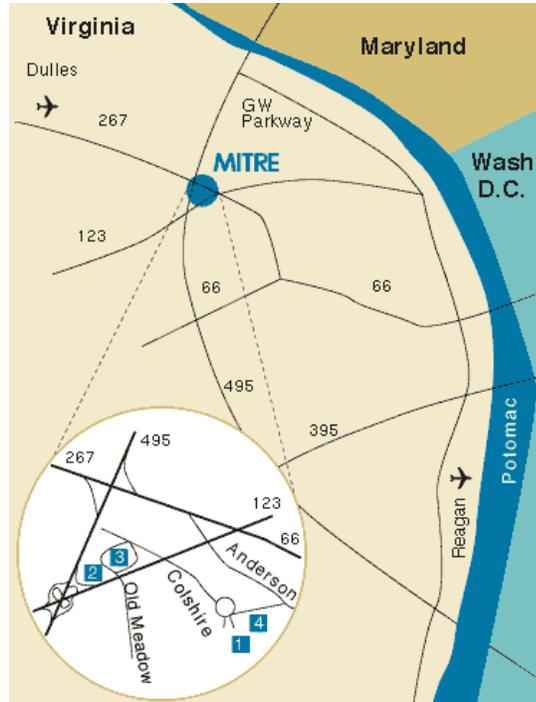
Directions to the FDA Tech Center in Gaithersburg, Maryland:

From I-270 N or S, take Shady Grove exit east and proceed to Gaither Road. Turn LEFT on Gaither and proceed to first stop sign. Turn Right on Industrial Drive. You will cross over I-370. Go to the large Industrial building at the end of Industrial Drive and bear left to the end of the building. The meeting will be at the FDA Tech Center, 16071-B Industrial Drive, Gaithersburg, MD.

From Route 355 (Frederick Rd), take Shady Grove West and proceed to Gaither Road. Turn RIGHT on Gaither Road and proceed to first stop sign. Turn Right on Industrial Drive. You will cross over I-370. Go to the large Industrial building at the END of Industrial Drive and bear left to the far end of the building. The meeting will be at the FDA Tech Center, 16071-B Industrial Drive.

Directions to the MITRE Facility in Eatonton, 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) and head around to the back of the building. Our main entrance is there. There is a MITRE sign above the door.

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) and head around to the back of the building. Our main entrance is there. There is a MITRE sign above the door.