



Defense Information Systems Agency
Joint Interoperability Test Command

T&E Panel Session

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The overall classification of this brief is:
UNCLASSIFIED



Panel Members



Moderator

- **Dr. Lee Whitt**, Northrop Grumman, Technical Fellow

Panel

- ✓ **Peter Bostrom**, BEA Systems, Federal CTO
- ✓ **Dr. Sumeet Malhotra**, Unisys Corp., Global Director of Advanced Research and Standards Strategy
- ✓ **Rick Toliver**, Teledyne Solutions, Chief Scientist
- ✓ **Dr. Charles Dickerson**, Loughborough University (UK), Chair of Systems Engineering; Chair, INCOSE Architecture Working Group



T&E Discussion Topic



Should we give up the ghost on T&E?

Marie Antoinette is said to have asked Louis XVI's finance minister:

"What are you going to do about the deficit?"

The minister purportedly answered:

"Nothing Madame. It is too serious."



Key Questions



- **Why has so little progress been made in T&E?**
 - *....while software design & development has undergone a dramatic transformation*
- **Why is today's T&E so poor?**
 - *Typically ad hoc*
 - *Mostly qualitative*
 - *Very labor-intensive*

Little change over the last 20 years!!
- **Why is traditional T&E thinking completely wrong for net-centric systems?**
- **Why doesn't anyone have a clue about how to transform T&E?**



Relevant Observations



SW: MS Vista

- 50M SLOCS
- \$10B cost (SW development)
- Beta test process
 - ✓ Released to 5M beta testers
 - ✓ Multi-year beta test period
 - ✓ \$50B cost (pro bono)

When released to the public, various problems limited widespread adoption

HW: Nuclear Plants, Aircraft; GM cars w/Onstar...

- T&E embedded in design & development process
- Instrumentation is standardized



Is There a Crisis in Testing?



No ... *not happening*

- Industry is applying best practices in design & development
- COTS product vendors are re-doubling their efforts
- Discipline is improvement (CMMI, Six Sigma)
- DoD T&E tools continue to advance (e.g., NESI, NCAT)
- Software fixes are (generally) available quickly
- Good coders are winning

We're more skilled, with better technology and better tools





Is There a Crisis in Testing?



Yes ... and getting worse

- We test today much like we tested 20 years ago....yet tomorrow's software systems will be radically different from legacy systems
- Modeling & model validation have not kept pace
- System complexity far exceeds our test methodologies
- Users want end-to-end test/cert....barely feasible for legacy systems and nearly impossible for tomorrow's composable, dynamic, hyper-complex NCW systems
- Black box testing is the norm....but quality, interoperability, security, etc. can't be tested into software
- There are no accepted industry standards for T&E
- Poor (inexperienced) coders are winning

We're in a deep hole and rapidly backsliding





Q&A

