Model-Assisted Probability of Detection

Eric Lindgren
AFRL – MLLP (NDE Branch)
MAPOD WGM
April 20, 2007

Agenda

- 0830: Overview of Effort and Motivation (Lindgren and Malas)
- 0900: Review of Demonstration Effort (Forsyth)
- 0930: Update on Studies of Cracks vs. Notches (DSTO, QinetiQ, ISU, AFRL, NIAR)
- 1030: Break
- 1045: Discussion on Open Issues for Cracks vs. Notches (Forsyth, Lindgren, Thompson – Moderators)
- 1130: Review of Totem Pole Issues (Thompson)
- 1200 Lunch
- 1300: Discussion of Progress towards Totem Pole Issues (Thompson, Lindgren, Forsyth – Moderators)
- 1500: Advanced Topics
- 1700: Review of Timeline for Demonstration Effort (Lindgren, Forsyth, Thompson)

Motivation

- Save Time and Money!
- Demonstrate capability of inspections
- Minimize time to deploy new inspections

- Addresses emerging wave of inspection requirements
- Insures aircraft availability for mission
 - USAF: for Warfighter

Objectives

- Complete Demonstrators
- Report results
- Insure consensus on process
- Chart Progress
- Complete by 2008

Milestones

- 1. Address items identified in Totem Pole
- Demonstrate transfer function for "simple:" inspection scenario surface breaking cracks - 2007
- 3. Demonstrate hybrid function for "complex" inspection scenario two layered structure 2008
- 4. Demonstrate applicability to variation in geometry 2008
- Demonstrate applicability to significantly different inspection requirements, e.g. engines vs. structures

Milestones	2007	2008	2009
1			
2			
3			
4			
5			

Totem Pole

- System Calibration
- Probe Characterization
- Model Validation
- Transfer Function Validation
- Specimen Design
- Cracks vs. Notches
- Number of Specimens
- Noise
- How do you know you are right?
- Concurrent Programs: data capture

What is Success?

- Ideal: Complete demonstrators
- Minimum: Learn everything we can and apply this knowledge