Panel
Voting System Testing & Certification

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Why Test or Certify

• **Objective:** Develop **Trust or Confidence** a specific target of evaluation performs as described
  – Manage Risk To Acceptable Level

• Two Basic Factors to gain Trust
  – Validation of System Characteristics
  – Assurance – Level of Confidence

• **Challenges**
  – Complexity is the enemy of assurance
  – Manage level or scope of negative and “open” testing
Traditional Test Structure

• **Operational Tests** *(system still works as planned)*
  – Logic and Accuracy
  – Audits and Cross Checks
  – Self tests

• **Acceptance Tests**
  – Production Units perform to design

• **First Article**
  – Does a production unit match the approved design

• **Design Characteristics (Floor – VVSG – State Cert)**
  – Features and Functionality
  – Design Qualification Tests *(reliability/environmental)*
Potential Strategies

• Explore and Develop Quantum Improvement Leaps

• In Parallel Implement All Opportunities to Improve Current Certification
  – Lower Cost
  – Faster
  – Maintain Confidence (assurance)
Potential Strategies

• **Promote Test Consistency**
  – Common Test Cases
    • Repeatable Lab to Lab Test to Test
    • Results more comparable
    • Use/Reuse promotes Process (test) improvements

• **Promote Modularity**
  – Common Data Format
  – Enables Improved Testability
    • Reduced Time/Cost
    • Improved Test Thoroughness
Potential Strategies

- **Automation**
  - Self Tests
  - Build in Test Interfaces and strategies during the design
  - Parallel development Separate teams to same req.
    - Software Simulator
    - Product implementation

Diagram:
- **Data / Command Generator**
  - Generates "random" sets of data and commands in attempt to exercise all possible valid and invalid inputs
- **Simulator**
- **Product**
- **Output Comparator Logger**
  - Stops Process if outputs do not match
Summary

• With focus and working together we can improve Certification Testing to better satisfy our mutual customers; the local jurisdictions and voters.
  – Reduce Cost
  – Reduce Time
  – Improve Thoroughness
  – Improve Trust