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COMMUNICATIONS AND NETWORKS

# NG9-1-1 Conformance & Interoperability Testing Program Status Update

Aug 20, 2025

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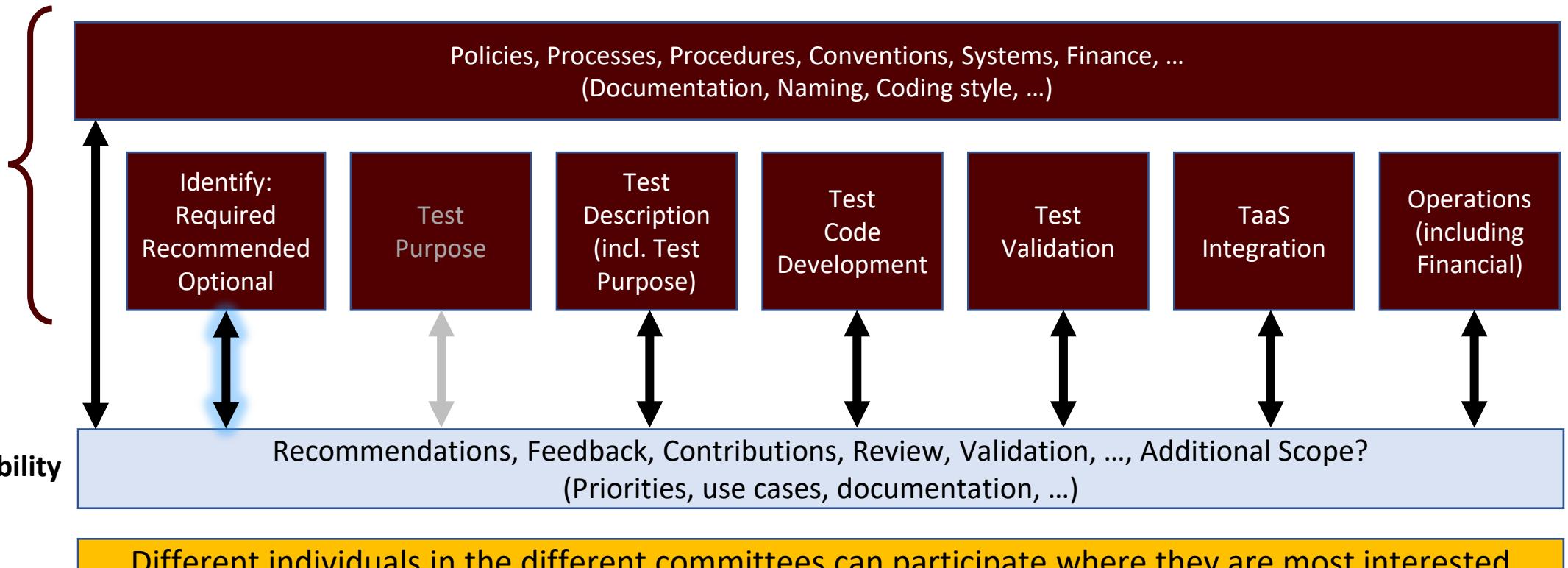
# Initial Scope of ITF Involvement



**CACN**



**NG9-1-1  
Interoperability  
Task Force**

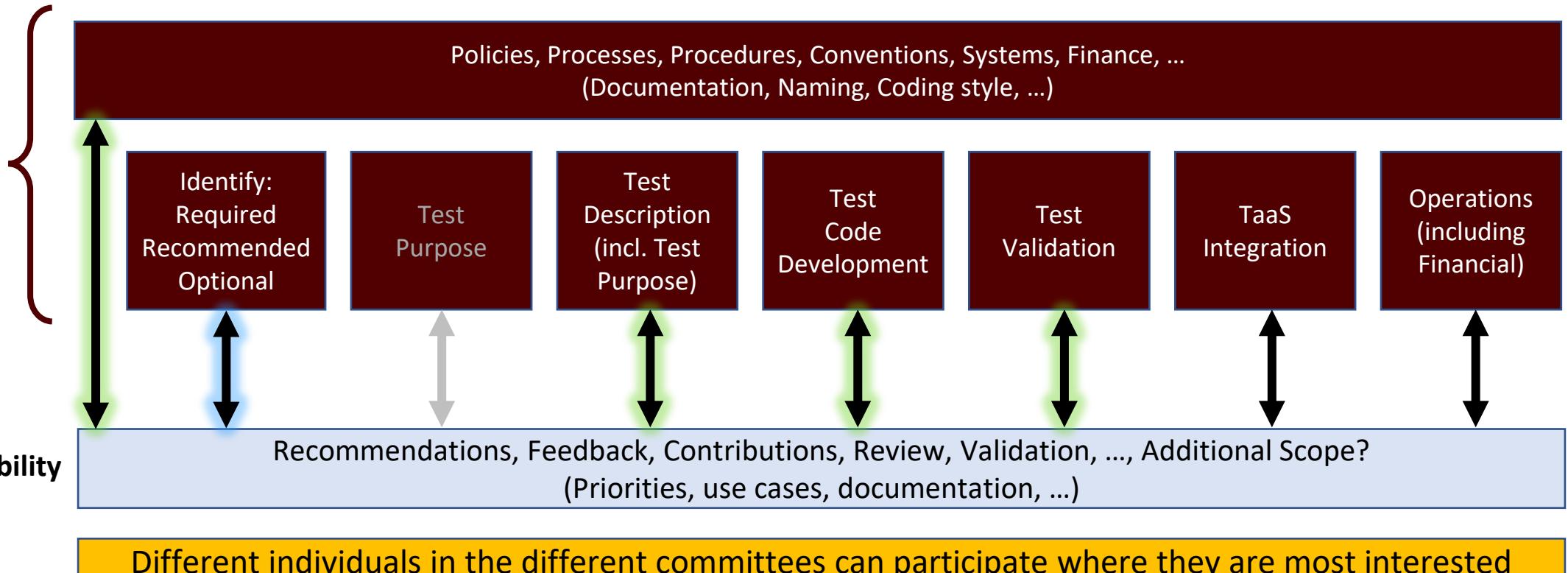


# Current ITF Involvement Needs

Policy, Process, Procedure Requirements (continued)  
Test Descriptions  
Test Code  
Test Validation



NG9-1-1  
Interoperability  
Task Force



Legend:  Meetings; discussions; reviewing documentation and code; testing; logging issues; submitting code; ...

# Public GitHub

<https://github.com/tamu-edu/ng911-dev/wiki>

- Program Info
  - Conformance
  - Interoperability
  - End-to-End
- Conformance Testing System
  - Requirements
  - Test Descriptions
  - Test Software
- ISO Lab Info
  - Process
  - Documentation
  - Training

## Home

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## NG9-1-1 Conformance and Interoperability Program

The NG9-1-1 Conformance and Interoperability Program will deliver conformance, interoperability, and end-to-end testing of NG9-1-1 solutions.

- [Project News](#)
- [Project Overview Video](#)

## NG9-1-1 Test Suite

### Conformance Testing

- [Overview](#)
- [Requirements](#)
- [Test Descriptions](#)
- [Test Software](#)

### Interoperability Testing

- [Overview](#)

### End-to-End Testing

- [Overview](#)

### Community Engagement

- [Interoperability Task Force](#)
- [GitHub](#)

## NG9-1-1 ISO 17025 Laboratory

### Using the Lab

- [Process](#)
- [Contact](#)

### Learning About or Becoming a Lab

- [Overview](#)
- [Documentation](#)
- [Training](#)

Pages 24

Find a page...

Home

NG9-1-1 Conformance and Interoperability Program

NG9-1-1 Test Suite

Conformance Testing

Interoperability Testing

End-to-End Testing

Community Engagement

NG9-1-1 ISO 17025 Laboratory

Using the Lab

Learning About or Becoming a Lab

Conformance Test Descriptions

Conformance Testing Overview

Conformance Testing Requirements

Conformance Testing Software

End-to-End Testing Overview

gen-report man page

Github Usage

Install Prerequisites

Install Test Suite

Interoperability Testing Overview

ISO 17025 Lab Contact

ISO 17025 Lab Documentation

ISO 17025 Lab Overview

ISO 17025 Lab Process

Show 9 more pages...

+ Add a custom sidebar

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<https://github.com/tamu-edu/ng911-dev>



# Policy, Process, Procedure, ...

- Using the Lab
  - Process
  - Contact
- Learning About or Becoming a Lab
  - Overview
  - Documentation
  - Training

## Home

Michael Fox edited this page last week · 19 revisions

## NG9-1-1 Conformance and Interoperability Program

The NG9-1-1 Conformance and Interoperability Program will deliver conformance, interoperability, and end-to-end testing of NG9-1-1 solutions.

- [Project News](#)
- [Project Overview Video](#)

## NG9-1-1 Test Suite

### Conformance Testing

- [Overview](#)
- [Requirements](#)
- [Test Descriptions](#)
- [Test Software](#)

### Interoperability Testing

- [Overview](#)

### End-to-End Testing

- [Overview](#)

### Community Engagement

- [Interoperability Task Force](#)
- [GitHub](#)

## NG9-1-1 ISO 17025 Laboratory

### Using the Lab

- [Process](#)
- [Contact](#)

### Learning About or Becoming a Lab

- [Overview](#)
- [Documentation](#)
- [Training](#)

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# Policy, Process, Procedure, ... Validation

- Documentation
  - Quality Manual (guide to everything else)
  - 7 Normative References
  - 4 Policies
  - 19 SOPs
  - 25 Forms
  - 11 Records
  - 3 Lists
  - 19 Miscellaneous
- Training
  - General ISO
  - Lab Manager
  - Center Management

## ISO 17025 Lab Documentation

vvetrone edited this page 3 weeks ago · [10 revisions](#)

The following documentation is used by the Texas A&M Center for Applied Communications and Networks for ISO/IEC 17025 accredited lab operations.

**To Get Started:** Please refer to the [Quality Manual](#) which provides direction and guidelines for the relevant resources.

### Forms

- [F-001 Complaint Processing Form.docx](#)
- [F-002 Information Disclosure Justification.docx](#)
- [F-003 Confidentiality Acknowledgement.docx](#)
- [F-004 Impartiality Acknowledgement.docx](#)
- [F-005 Conflict of Interest Disclosure.docx](#)
- [F-006 Annual Impartiality Risk Assessment.docx](#)
- [F-007 Project Impartiality Risk Assessment.docx](#)
- [F-008 Impartiality Incident Assessment.docx](#)
- [F-009 Laboratory Concern Reporting Form.docx](#)
- [F-010 New Document Template.docx](#)
- [F-011 New Document Initiation Request.docx](#)
- [F-012 Document Change Request.docx](#)
- [F-013 Peer Review of New or Revised Document.docx](#)
- [F-014 Request for External Document.docx](#)
- [F-015 Annual Document Review.docx](#)
- [F-016 New SOP Template.docx](#)

## ISO 17025 Lab Training

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All personnel involved in the ISO Lab operations need to be trained on how to perform their duties according to the policies and procedures defined for the lab. The following training courses provide the foundation for that training.

- [General ISO Training.pptx](#)
- [Role-based Training Lab Manager.pptx](#)
- [Role-based Training Mgmt.pptx](#)

# Requirements

- Info about NENA i3 and normative language
- Copies of existing ITF spreadsheets
- New Req/SCS/ICS spreadsheet

## Home

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## NG9-1-1 Conformance and Interoperability Program

The NG9-1-1 Conformance and Interoperability Program will deliver conformance, interoperability, and end-to-end testing of NG9-1-1 solutions.

- [Project News](#)
- [Project Overview Video](#)

## NG9-1-1 Test Suite

### Conformance Testing

- [Overview](#)
- [Requirements](#)
- [Test Descriptions](#)
- [Test Software](#)

### Interoperability Testing

- [Overview](#)

### End-to-End Testing

- [Overview](#)

### Community Engagement

- [Interoperability Task Force](#)
- [GitHub](#)

## NG9-1-1 ISO 17025 Laboratory

### Using the Lab

- [Process](#)
- [Contact](#)

### Learning About or Becoming a Lab

- [Overview](#)
- [Documentation](#)
- [Training](#)

Pages 24

Find a page...

Home

NG9-1-1 Conformance and Interoperability Program

NG9-1-1 Test Suite

Conformance Testing

Interoperability Testing

End-to-End Testing

Community Engagement

NG9-1-1 ISO 17025 Laboratory

Using the Lab

Learning About or Becoming a Lab

Conformance Test Descriptions

Conformance Testing Overview

Conformance Testing Requirements

Conformance Testing Software

End-to-End Testing Overview

gen-report man page

Github Usage

Install Prerequisites

Install Test Suite

Interoperability Testing Overview

ISO 17025 Lab Contact

ISO 17025 Lab Documentation

ISO 17025 Lab Overview

ISO 17025 Lab Process

Show 9 more pages...

+ Add a custom sidebar

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<https://github.com/tamu-edu/ng911-de>



# Requirements Validation (Continued)

- ITF Spreadsheets
  - Same as we've been working on
- SCS/ICS
  - Individual ITF spreadsheets become a workbook tab
    - Nothing deleted; columns rearrange for consistency, ICS
  - System Conformance Statement tab (1/system)
    - New form; identifies system, company, etc.
  - Implementation Conformance Statement tabs (1/FE type)
    - Requirements that apply to multiple FEs are copied to appropriate tab
    - Updated: testability (yes/no), basic/adv, notes
    - Includes Static (untestable) and Dynamic (testable)
  - Single source of truth
    - Track requirements going forward (after a little more work)
    - Lab client will submit prior to testing
    - Can also be used independently

## NG9-1-1 Functional Element (FE) Conformance Requirements

This project will initially focus on conformance testing of the following nine Functional Elements (FEs).

### Validated with the NG9-1-1 Interoperability Task Force

The following lists of Requirements, Recommendations, and Options for each of the FEs was developed in conjunction with the [NG9-1-1 Interoperability Task Force](#). The files for each FE are listed below:

- LIS - Location Information Server
  - [LIS Requirements v20250813.xlsx](#)
- BCF - Border Control Function
  - [BCF Requirements v20250813.xlsx](#)
- ESRP - Emergency Services Routing Proxy
  - [ESRP Requirements v20250813.xlsx](#)
- ECRF - Emergency Communications Routing Function
  - [ECRF-LVF Requirements v20250813.xlsx](#)
- LVF - Location Verification Function
  - [ECRF-LVF Requirements v20250813.xlsx](#)
- PS - Policy Store
  - [PS Requirements v20250813.xlsx](#)
- BRG - Conference Bridge
  - [BRG Requirements v20250813.xlsx](#)
- LOG - Logger
  - [LOG Requirements v20250813.xlsx](#)
- CHE - Call Handling Equipment
  - [CHE Requirements v20250813.xlsx](#)

The initial focus of testing will be on Normative Requirements for these functional elements. Additional FEs, as well as Recommended and Optional behaviors, will be considered if time and budget permit.

### SCS/ICS (Work In Progress)

The following version of the requirements is currently a work in progress and has not yet been validated by the NG9-1-1 ITF. This document converts the requirements spreadsheets into a combined System Conformance Statement (SCS) and Implementation Conformance Statements (ICS). It includes the following enhancements:

- Consolidates the mandatory requirements from the above separate spreadsheets into a single workbook, with separate tabs/spreadsheets for each functional element
  - Recommendations, options, and requests for clarification are not yet included
- Reformats all spreadsheets to have the same columns, in the same order
- Reorganizes the columns so that the same spreadsheet can serve as the requirements list *and* the SCS/ICS form, simply by hiding some columns
- Identifies the discrete FE types where FE categories were previously listed
  - For example, "all SIP FEs" is converted to a discrete list
- Copies or moves the requirements to their correct tab/spreadsheet
- Clarifies and corrects some categorizations of Testable/Dynamic vs Non-testable/Static
- Clarifies and corrects some categorizations of Basic vs Advanced
- Identifies how testing could be accomplished for some requirements (more to follow)
- Tallies some statistics about numbers of requirements for each FE and overall

This document is actively being updated. New versions will be posted as major changes are completed.

#### SCS/ICS

- [SCS ICS v250814-1628.xlsx](#)

# Example ICS Form

- ICS uses same spreadsheets but with only the following columns showing:
  - Requirement ID, Requirement Text, Source (NENA-STA-010...), Section, Conform? (Y, N, N/A)

NG9-1-1 Implementation Conformance Statement (ICS) for: Border Control Function (BCF)					
Req id	Text	Source	Section	Conform?	
Static					
Mandatory					
	Answer "Y" or "N" for each requirement.				
RQ_BCF_002	NG9-1-1 elements that process 9-1-1 calls MUST accept calls that do not strictly follow the SIP standards. As long as the messages can be parsed, and the method discerned, at least the first SIP element (the BCF) MUST be able to accept the call and forward the call onward (see Section 4.1) Support for the following SIP Methods is summarized and specified in the following table: <a href="#">(See underlying table)</a>	NENA-STA-010.3d-2021	3.1.1		
RQ_BCF_011	The BCF MUST support the following security related techniques: Prevention, Detection, Reaction.	NENA-STA-010.3d-2021	4.1.1		

# Test Descriptions

- Overview
  - WHAT and HOW the FE will be tested
  - Requirement(s) tested
  - Test Case
- Configuration
  - Test System, FE Under Test
- Pre-Test Conditions
- Test Sequence
  - Preamble, body, postamble
- Post-Test Conditions
- Packet Sequence Diagrams
- Comments / Footnotes

## Home

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## NG9-1-1 Conformance and Interoperability Program

The NG9-1-1 Conformance and Interoperability Program will deliver conformance, interoperability, and end-to-end testing of NG9-1-1 solutions.

- [Project News](#)
- [Project Overview Video](#)

## NG9-1-1 Test Suite

### Conformance Testing

- [Overview](#)
- [Requirements](#)
- [Test Descriptions](#)
- [Test Software](#)

### Interoperability Testing

- [Overview](#)

### End-to-End Testing

- [Overview](#)

### Community Engagement

- [Interoperability Task Force](#)
- [GitHub](#)

## NG9-1-1 ISO 17025 Laboratory

### Using the Lab

- [Process](#)
- [Contact](#)

### Learning About or Becoming a Lab

- [Overview](#)
- [Documentation](#)
- [Training](#)

Pages 24

Find a page...

Home

NG9-1-1 Conformance and Interoperability Program

NG9-1-1 Test Suite

Conformance Testing

Interoperability Testing

End-to-End Testing

Community Engagement

NG9-1-1 ISO 17025 Laboratory

Using the Lab

Learning About or Becoming a Lab

Conformance Test Descriptions

Conformance Testing Overview

Conformance Testing Requirements

Conformance Testing Software

End-to-End Testing Overview

gen-report man page

Github Usage

Install Prerequisites

Install Test Suite

Interoperability Testing Overview

ISO 17025 Lab Contact

ISO 17025 Lab Documentation

ISO 17025 Lab Overview

ISO 17025 Lab Process

Show 9 more pages...

+ Add a custom sidebar

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# Test Description Validation

- What is being tested
- Network configuration
- How it is being tested
  - Checks
  - Variations/scenario files (XML)
- How a verdict is declared

The screenshot shows a GitHub repository interface for the 'ng911-dev' repository. The 'Code' tab is selected, highlighted with a yellow box. The repository path is 'tamu-edu / ng911-dev'. The file 'TD\_BCF\_001.md' is selected in the file tree on the left. The right panel displays the content of 'TD\_BCF\_001.md' with the following sections:

- Test Description: TD\_BCF\_001**
- Overview**
- Summary**

Adding Emergency Call, Incident Tracking identifiers and Resource Priority
- Description**

This test checks header fields added by O-BCF while routing SIP packets inside ESInet:

  - Emergency Call Identifier
  - Incident Tracking Identifier
  - Resource Priority
- SIP message variants:**
  - SIP INVITE
  - SIP MESSAGE
- Test steps description:**
  - 'Test System OSP' simulates SIP packets heading to O-BCF
  - O-BCF will route the same packets with added default headers to ESRP
  - 'Test System ESRP' receives SIP packets with added identifiers same way as ESRP normally would do
- SIP transport types**

Test can be performed with 2 different SIP transport types. Steps describing actions for specific one are marked as following:

  - (TLS transport) - used by default inside ESInet on production environment
  - (TCP transport) - used in lab for testing purposes only if default TLS is not possible
- References**
  - Requirements : RQ\_BCF\_001, RQ\_BCF\_045, RQ\_BCF\_046, RQ\_BCF\_002, RQ\_BCF\_003, RQ\_BCF\_005, RQ\_BCF\_006, RQ\_BCF\_007, RQ\_BCF\_008
  - Test Case : TC\_BCF\_001
- Requirements**

IXIT config file for BCF
- Configuration**
- Implementation Under Test Interface Connections**
  - Test System (OSP)
    - IF\_OSP\_O-BCF - connected to O-BCF IF\_O-BCF\_OSP
  - O-BCF
    - IF\_O-BCF\_OSP - connected to Test System IF\_OSP\_O-BCF
    - IF\_O-BCF\_ESRP - connected to Test System IF\_ESRP\_O-BCF
  - Test System (ESRP)
    - IF\_ESRP\_O-BCF - connected to IF\_O-BCF\_ESRP
- Test System Interfaces**
  - Test System (OSP)
    - IF\_OSP\_O-BCF - Active
  - O-BCF

# Test System Software

- Operating Envi

## Home

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## NG9-1-1 Conformance and Interoperability Program

The NG9-1-1 Conformance and Interoperability Program will deliver conformance, interoperability, and end-to-end testing of NG9-1-1 solutions.

- [Project News](#)
- [Project Overview Video](#)

## NG9-1-1 Test Suite

### Conformance Testing

- [Overview](#)
- [Requirements](#)
- [Test Descriptions](#)
- [Test Software](#)

### Interoperability Testing

- [Overview](#)

### End-to-End Testing

- [Overview](#)

### Community Engagement

- [Interoperability Task Force](#)
- [GitHub](#)

## NG9-1-1 ISO 17025 Laboratory

### Using the Lab

- [Process](#)
- [Contact](#)

### Learning About or Becoming a Lab

- [Overview](#)
- [Documentation](#)
- [Training](#)

Pages 24

Find a page...

Home

NG9-1-1 Conformance and Interoperability Program

NG9-1-1 Test Suite

Conformance Testing

Interoperability Testing

End-to-End Testing

Community Engagement

NG9-1-1 ISO 17025 Laboratory

Using the Lab

Learning About or Becoming a Lab

Conformance Test Descriptions

Conformance Testing Overview

Conformance Testing Requirements

Conformance Testing Software

End-to-End Testing Overview

gen-report man page

Github Usage

Install Prerequisites

Install Test Suite

Interoperability Testing Overview

ISO 17025 Lab Contact

ISO 17025 Lab Documentation

ISO 17025 Lab Overview

ISO 17025 Lab Process

Show 9 more pages...

+ Add a custom sidebar

Clone this wiki locally

<https://github.com/tamu-edu/ng911-de>



# Test System Software Validation

- Clone the repo and run it
- What needs better documentation?
  - Installation
  - Configuration
  - Operations
  - Output
- What needs fixing/improving?

## Conformance Testing Software

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### Location

The test suite can be found in the "Code" section of the repository.

### Operating Environment

#### Hardware/Virtual Machine

- 2 CPU/vCPU
- Minimum 2GB recommended
- Minimum 50GB storage (dependent on expected log level, report volume, and retention policy)

#### Operating System

- Ubuntu 24.04 LTS is recommended.
- Other versions of Linux should also work, but have not been tested.

#### Installation

- [Prerequisites](#)
- [Test Suite](#)

#### Configuration

- [Test Configuration](#)
- [Lab Configuration](#)
- [Launch Configuration](#)
- [Run Configuration \(Optional\)](#)

#### Man Pages

- [validate](#)
  - The validate command is used before running the test suite to validate the various info and config files used as input by the test suite.
- [main](#)
  - The main command is used to execute the test suite.
- [gen-report](#)
  - The gen-report command can be used after a test campaign to generate an additional report, such as in a different format, or with more or less detail.

#### Output

The `launch_config` file specifies the directory path where all output from the test campaign will be stored. This output includes everything needed to audit the test campaign at a later date:

- all info files used: `lab_info.yaml`, `test_info.yaml`
- all config files used: `launch_config.yaml`, `lab_config.yaml`, `test_config.yaml`, `run_config.yaml`
- all logs
- all packet capture files
- all console output
- all report files in the configured format(s):
  - PDF and DOCX: summary or detailed reports for humans
  - XML (JUnitXML): for CI/CD integration
  - JSON & CSV: for data analysis

Pages 24

Find a page...

Home

Conformance Test Descriptions

Conformance Testing Overview

Conformance Testing Requirements

Conformance Testing Software

Location

Operating Environment

Hardware/Virtual Machine

Operating System

Installation

Configuration

Man Pages

Output

End-to-End Testing Overview

gen-report man page

GitHub Usage

Install Prerequisites

Install Test Suite

Interoperability Testing Overview

ISO 17025 Lab Contact

ISO 17025 Lab Documentation

ISO 17025 Lab Overview

ISO 17025 Lab Process

Show 9 more pages...

+ Add a custom sidebar

Clone this wiki locally

<https://github.com/tamu-edu/ng911-de> 



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NG9-1-1 Public GitHub (Aug 1, 2025):  
<https://github.com/tamu-edu/ng911-dev/wiki>

CACN Web Site: <https://cacn.tamus.edu>