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Executive Summary

<All instructional text is in Italic green font color and contained within the symbols “<” and “>”. These should be deleted prior to document submission.>

<The purpose of this template, upon completion, is to describe, at a high level, the Offeror’s overall test strategy. The Offeror shall use the Section J, Attachment J-8, IOC/FOC Target Timeline; Section C, Statement of Objectives (SOO); and the Recommended Minimum Technical Requirements to Ensure Nationwide Interoperability for the Nationwide Public Safety Broadband Network (herein referred to as the FCC TAB) as references when completing this template. Section J, Attachment J-8, IOC/FOC Target Timeline, describes at a high level what features and functions need to be delivered by the Offeror and when they need to be delivered.>

<The Offeror shall add a brief Executive Summary.>

<The Offeror shall include key information in this document, including but not limited to the following:

- A mapping of SOO and FCC TAB items to Initial Operational Capability (IOC) and/or Final Operational Capability (FOC) milestones*
- A description of the strategy employed to verify the SOO and FCC TAB*
- A high-level description of what test configurations and types of test environments will be employed per IOC and FOC*
- A high-level description of the entrance and exit criteria per IOC and for the FOC*
- A section describing the test strategy schedule and test management*
- A section describing the necessary equipment, test tools, and training>*

1 Introduction

<The Offeror shall add a brief, high-level introduction describing the overall test strategy scope that will be employed to validate the FCC TAB and SOO per IOC and for the FOC.>

2 Test Strategy

2.1 Test Approach

<Using Table 1 FirstNet Statement of Objectives and FCC TAB Item Mapping to IOC/FOC Milestones below, the Offeror shall briefly describe the test approach that focuses on the end-to-end system level testing that will be completed at each major milestone of the NPSBN rollout. The milestones planned for the NPSBN can be found in Section J, Attachment J-8, IOC/FOC Target Timeline. This IOC/FOC schedule maps system functionality to each IOC/FOC milestone. End-to-end testing is planned at milestones IOC-1 through IOC-5 and FOC.>

<In addition to Table 1 FirstNet Statement of Objectives and FCC TAB Item Mapping to IOC/FOC Milestones below, the Offeror will describe their test strategy for the following items in the sections following the table:

- *User Equipment (UE) Test Strategy*
- *Radio Access Network (RAN) Test Strategy*
- *Evolved Packet System (EPS) and IP Multimedia Subsystem Test Strategy*
- *Network Services/Service Delivery Platform Test Strategy*
- *Application Test Strategy*
- *Operational Support System (OSS) and Business Support System (BSS) Test Strategy*
- *End-to-End Regression Test Strategy>*

Table 1 FirstNet Statement of Objectives and FCC TAB Item Mapping to IOC/FOC Milestones

Statement of Objective/ FCC TAB Item	Item Summary	IOC and/or FOC Milestone to be Validated In
C.5-1: BUILDING, DEPLOYMENT, OPERATION, AND MAINTENANCE OF THE NPSBN	Refer to Section C.5-1 of the SOO	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
C.5-2: FINANCIAL SUSTAINABILITY	Refer to Section C.5-2 of the SOO	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
C.5-3: FIRST RESPONDER USER ADOPTION	Refer to Section C.5-3 of the SOO	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
C.5-4: DEVICE ECOSYSTEM	Refer to Section C.5-4 of the SOO	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
C.5-5: APPLICATIONS ECOSYSTEM	Refer to Section C.5-5 of the SOO	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
C.5-6: ACCELERATED SPEED TO MARKET	Refer to Section C.5-6 of the SOO	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
C.5-7: USER SERVICE AVAILABILITY	Refer to Section C.5-7 of the SOO	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
C.5-8: SERVICE CAPACITY	Refer to Section C.5-8 of the SOO	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
C.5-9: CYBERSECURITY	Refer to Section C.5-9 of the SOO	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
C.5-10: PRIORITY SERVICES	Refer to Section C.5-10 of the SOO	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>

Statement of Objective/ FCC TAB Item	Item Summary	IOC and/or FOC Milestone to be Validated In
C.5-11: INTEGRATION OF STATE-DEPLOYED RANs	Refer to Section C.5-11 of the SOO	< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.>
C.5-12: INTEGRATION OF EXISTING COMMERCIAL/FEDERAL/STATE/TRIBAL/LOCAL INFRASTRUCTURE TO SUPPORT NPSBN SERVICES	Refer to Section C.5-12 of the SOO	< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.>
C.5-13: LIFE-CYCLE INNOVATION	Refer to Section C.5-13 of the SOO	< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.>
C.5-14: PROGRAM AND BUSINESS MANAGEMENT	Refer to Section C.5-14 of the SOO	< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.>
C.5-15: CUSTOMER CARE AND MARKETING	Refer to Section C.5-15 of the SOO	< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.>
C.5-16: FACILITATION OF FIRSTNET'S COMPLIANCE WITH THE ACT AND OTHER LAWS	Refer to Section C.5-16 of the SOO	< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.>
FCC-001-01-F	Hardware and software systems comprising the NPSBN shall implement interfaces consistent with Table 2: Standards Implementation Methodology.	< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.>
FCC-001-02-F	Hardware and software systems comprising the NPSBN shall support the interfaces enumerated in Table 1: Minimum Interoperable Interfaces.	< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.>
FCC-001-03-F	Hardware and software systems comprising the NPSBN shall support management functions.	< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.>
FCC-001-04-F	Hardware and software systems comprising the NPSBN shall support Access Point Names (APNs) defined for PSAN usage.	< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.>

Statement of Objective/ FCC TAB Item	Item Summary	IOC and/or FOC Milestone to be Validated In
FCC-001-05-F	Hardware and software systems comprising the NPSBN shall support nationwide APNs for interoperability.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-06-F	Hardware and software systems comprising the NPSBN shall enable Quality of Service (QoS) control for PSAN-hosted applications via the 3rd Generation Partnership Project (3GPP) 'Rx' interface.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-07-F	The NPSBN shall support IPv4, IPv6, and IPv4/v6 Packet Data Network (PDN) types defined in 3GPP TS 23.401.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-08-F	The NPSBN shall support IPv4 and/or IPv6 transport for the Evolved Packet System (EPS) interfaces enumerated in Table 1: Minimum Interoperable Interfaces, consistent with the FirstNet design.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-09-F	Any sharing agreement that FirstNet enters into shall implement network sharing according to 3GPP TS 23.251 and shall not impact public safety operations.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-10-F	The NPSBN shall include the capability to collect and convey UE location data to applications using a standardized interface in nearly real time.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-11-F	The NPSBN shall be capable of providing public safety subscribers with access to the global Internet.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-12-F	All UEs deployed on the NPSBN shall conform to the 3GPP Release 9 Uu interface enumerated in Table 1: Minimum Interoperable Interfaces.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-13-F	All UEs deployed on the NPSBN shall conform to the 3GPP TS 36.306 UE Radio Access Capabilities, Release 9.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-14-F	All UEs shall support interworking of the device with the USIM/USAT applications on the Universal Integrated Circuit Card (UICC) in accordance with the relevant 3GPP 31.101, 31.102, and 31.111 standards.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>

Statement of Objective/ FCC TAB Item	Item Summary	IOC and/or FOC Milestone to be Validated In
FCC-001-15-F	All UEs deployed on the NPSBN that support roaming onto commercial Long Term Evolution (LTE) networks shall operate on any FirstNet roaming partner network using bands supported by the device.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-16-F	All UEs shall support dual IPv4/IPv6 stacks.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-17-F	Prior to IOT and system-level testing, UEs shall have met 3GPP conformance and certification requirements per an independent conformance testing organization (e.g., PCS Type Certification Review Board).	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-18-F	Prior to operational deployment on the NPSBN, UEs shall have passed FirstNet-required interoperability testing (e.g., using a subset of applicable test cases from CTIA IOT and UICC functional test cases, vendor IOT, or similar commercial LTE industry practice).	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-19-F	Prior to operational deployment on the NPSBN, UEs shall have passed FirstNet-required UICC functional testing.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-20-F	Prior to operational deployment on the NPSBN, infrastructure equipment shall have passed FirstNet-required interface conformance testing (e.g., testing S1-MME [Mobility Management Entity] conformance to 3GPP) on the interfaces specified by FirstNet.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-21-F	Prior to operational deployment on the NPSBN, infrastructure equipment shall have passed FirstNet-required interoperability testing at a system level as per the specific IOT requirements for the NPSBN.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-22-F	Infrastructure deployed on the NPSBN shall be included in the FirstNet-required First Office Application (FOA) process as part of the NPSBN deployment.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>

Statement of Objective/ FCC TAB Item	Item Summary	IOC and/or FOC Milestone to be Validated In
FCC-001-23-F	The equipment comprising the NPSBN shall provide backwards compatibility of interfaces, from time of deprecation, for a minimum of two full major release/upgrades of the network. This requirement may be waived (i.e., interface obsolescence accelerated) if FirstNet can ascertain from the user community that there are no dependencies on a given interface.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-24-F	The NPSBN shall support user mobility across the entire NPSBN (including state-deployed RANs).	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-25-F	The NPSBN shall support S1 and shall preferentially support X2 handover between adjacent NPSBN cells (including cells owned by states that assume responsibility for deploying their own RAN) whose proximity supports a handover opportunity.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-26-F	If roaming between the NPSBN and commercial LTE networks is implemented, the NPSBN shall follow GSMA PRD IR.88.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-27-F	If roaming between the NPSBN and commercial 3GPP 2G/3G networks is implemented, the NPSBN shall follow 3GPP TS 23.002 to support roaming into 3GPP 2G/3G networks.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-28-F	If roaming between the NPSBN and commercial 3GPP2 (eHRPD) networks is implemented, the NPSBN shall follow 3GPP 23.402 to support roaming into 3GPP2 (eHRPD) networks.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-29-F	The NPSBN shall support the use of mobile VPN technology to support mobility between the NPSBN and other networks.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-30-F	The NPSBN shall provide the ability for national, regional, and local applications to dynamically change a UE's prioritization and QoS using the 3GPP_Rx' interface.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-31-F	The NPSBN shall support all 9 QCI classes specified in table 6.1.7 of 3GPP 23.203 v9.11 or future equivalents.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-32-F	QoS mechanisms in the NPSBN shall comply with 3GPP TS 23.203.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>

Statement of Objective/ FCC TAB Item	Item Summary	IOC and/or FOC Milestone to be Validated In
FCC-001-33-F	The NPSBN shall support the usage of all 15 ARP values defined in 3GPP 23.203.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-34-F	The NPSBN shall support the ARP pre-emption capability and vulnerability functions as defined in 3GPP 23.203.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-35-F	The NPSBN shall implement a nationwide scheme for assigning access classes to public safety users and secondary users following the 3GPP recommendations in TS 22.011, Section 4.2.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-36-F	The NPSBN shall implement a nationwide scheme for assigning QoS class identifier priority to IP network and backhaul priority across the entire NPSBN.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-37-F	The NPSBN shall support the use of industry standard VPN and MVPN technology, while providing priority and Quality of Service for encapsulated applications.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-38-F	The NPSBN shall use a nationwide common security profile for user plane and control plane traffic between UEs, eNBs and MMEs, in accordance with 3GPP LTE Network Access Domain protocols. The profile shall be based on 3GPP TS 33.401, and will be determined by FirstNet based on a system design and other considerations as it deals with evolving cyber threats. As a minimum, the profile shall include specification of ciphering algorithms (for example, use of AES-128 vs. SNOW 3G).	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-39-F	The nationwide common security profile shall include ciphering of control plane traffic in order to provide for interoperable cyber protection of the network. Ciphering of user plane traffic is optional and is based on policy decisions that involve FirstNet and user agencies.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-40-F	To enable interoperable authentication, the USIM and HSS shall be capable of supporting the same key derivation functions, such as Milenage per 3GPP TS 35.205, 35.206.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>

Statement of Objective/ FCC TAB Item	Item Summary	IOC and/or FOC Milestone to be Validated In
FCC-001-41-F	Network domain security shall be implemented in accordance with 3GPP TS 33.210, which stipulates the use of IPSec to protect IP communication between administrative domains (including all network connections used to interconnect the domains).	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-42-F	The NPSBN shall comply with TS 33.310 as the authentication framework for Public Key Infrastructure to authenticate these network interfaces.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-43-F	In order to ensure secure and interoperable interfaces between the NPSBN and external elements (e.g., all SGi, Rx and Srvs services as shown in Figure 2), these interfaces shall be protected with a FirstNet-approved security mechanism.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-44-F	User domain security shall be implemented in accordance with 3GPP TS 33.102, TS 31.101, and TS 22.022.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-45-F	USIM-based applications that require messaging between the USIM and network components shall implement application domain security in accordance with 3GPP TS 33.102 and TS 31.111.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-46-F	In such cases where visibility is required for devices on the NPSBN, the implementations shall comply with 3GPP TS 33.102 and TS 22.101.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-47-F	Hardware and software systems comprising the NPSBN should support integration of existing network elements via the necessary commercial standards-defined LTE interfaces enumerated in Table 1: Minimum Interoperable Interfaces.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-48-F	Billing information from the NPSBN should be provided to each local and/or regional entity for the NPSBN services.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-49-F	The NPSBN should support existing public safety applications, deployed regionally or within agencies.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-50-F	The NPSBN should provide a method to connect a device to a packet data network where a homepage application is hosted with location specific content.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>

Statement of Objective/ FCC TAB Item	Item Summary	IOC and/or FOC Milestone to be Validated In
FCC-001-51-F	The NPSBN should provide a method where a homepage application is available via an alternate access network, other than the NPSBN. This is a recommendation that the homepage be made available and location-aware while roaming or over Wi-Fi.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-52-F	The NPSBN should provide a specification for locating a—homepage application based on current or manual location.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-53-F	The NPSBN should support use of field-deployed server applications.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-54-F	The NPSBN should support devices that are reachable via the global Internet and can be used to host field based server applications (i.e., deployable servers).	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-55-F	The NPSBN should allow the devices outside of their normal jurisdiction to connect to a local packet data network and to the device's home packet data network to carry out incident objectives.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-56-F	The NPSBN should provide the ability for users to send and receive Short Message Service (SMS) and Multimedia Messaging Service (MMS) messages.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-57-F	Voice sessions should be handed off within the NPSBN with limited delay and loss of audio during the transition. Because the devices and device capabilities for this feature will develop over time, this feature is a future evolution capability.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-58-F	The NPSBN should support Voice over LTE (cellular voice) capabilities using GSMA PRD IR.92.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-59-F	The NPSBN should allow the integration of high power LTE UEs as they become available, based on the methodology contained in Table 2: Standards Implementation Methodology.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-60-F	User devices and device management solutions should support remote management capabilities over- the-air, including software update, discovery, device platform configuration, lock, unlock, wipe, and security configuration.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>

Statement of Objective/ FCC TAB Item	Item Summary	IOC and/or FOC Milestone to be Validated In
FCC-001-61-F	The software systems that comprise the NPSBN should support the ability to enable local entities to install, update, and manage their own applications. This may include security, transport and local APN provisioning.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-62-F	The software systems that comprise the NPSBN should provide published and version-controlled subscriber provisioning interfaces to enable end-to-end subscriber provisioning by the local entities. These interfaces should be verified during interoperability testing.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-63-F	Prior to operational deployment on the NPSBN, infrastructure equipment should have passed FirstNet- required performance testing of individual interfaces, nodes and overall system as per the specific performance requirements of the NPSBN.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-64-F	Nationwide applications on the NPSBN should have passed FirstNet-required security testing to proper security levels (e.g., Criminal Justice Information Services [CJIS]) to ensure protection of FirstNet and public safety information.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-65-F	The NPSBN should allow for connection and operation of IP-based LMR voice interoperability gateways using open interfaces as they are developed.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-66-F	The NPSBN should be constructed and evolved in adherence to a multi-year roadmap.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-67-F	Infrastructure equipment procured for the NPSBN should support backwards compatibility with deployed LTE devices.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-68-F	Infrastructure equipment in the NPSBN should be upgradeable to, minimally, two major 3GPP releases (i.e., n+2, where n is the release available at deployment provided that the equipment does not need to implement a new air interface specification).	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>

Statement of Objective/ FCC TAB Item	Item Summary	IOC and/or FOC Milestone to be Validated In
FCC-001-69-F	Hardware and software systems comprising the NPSBN should support industry practices for management of standard network interfaces from each supplier. These industry practices include formal publication of interface compliance, deprecation of interfaces, support for backwards compatibility and graceful obsolescence of interfaces.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-70-F	The NPSBN should support industry practices for life cycle management of interfaces that it exposes to applications or users of the network to ensure backward compatibility for a reasonable interval, using industry- practice interface deprecation and obsolescence methods. The interfaces include, but may not be limited to: network messaging protocols, application programming interfaces, Web-based interfaces, protocol/messaging interfaces, and user interfaces such as command line interfaces.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-71-F	The EPC equipment in the NPSBN should support optional local and geographic redundancy.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-72-F	The equipment in the NPSBN should support transport redundancy wherever economically feasible (i.e., connections to local switching equipment or WAN connectivity between sites or core locations).	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-73-F	If roaming between the NPSBN and commercial LTE networks is implemented, and IP Multimedia Subsystem is implemented in the NPSBN, the NPSBN should implement support for IP Multimedia Subsystem while roaming into other LTE PLMNs.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-74-F	Coverage maps should be maintained that show pictorially which GoS tiers are supported over a geographic area. Detailed maps should be made available to authorized public safety agencies.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-75-F	NPSBN coverage maps showing planned future coverage should be maintained. The maps should show planned coverage at regular intervals (e.g., quarterly) into the future. These maps should be made available to authorized public safety agencies.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>

Statement of Objective/ FCC TAB Item	Item Summary	IOC and/or FOC Milestone to be Validated In
FCC-001-76-F	The NPSBN should use a set of pre-defined GoS tiers to provide clear and uniform description of the services of network performance provided within a coverage area.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-77-F	The GoS tiers should include the minimum set of GoS attributes defined in Section 4.6.3.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-78-F	The expected or actual GoS tier should be disclosed to authorized public safety agencies in a geographic region.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-79-F	Each coverage area should be designed to operate with a defined GoS tier.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-80-F	Service probability should be specified for each GoS tier, in order to specify the quality of the user experience provided by the network.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-81-F	The expected minimum uplink (mobile to network) and downlink (network to mobile) rates of data transmission should be specified for each GoS tier. The specifications must also include the protocol layer at which the data rates are to be measured.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-82-F	The NPSBN should implement a scheme for engineering RAN boundaries according to a national cell coordination plan.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-83-F	A set of default QoS profile templates should be defined for each responder function (e.g., police, fire, EMS) supported by the NPSBN.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-84-F	Each QoS profile template should contain a descriptive definition of the responder function and default values for ARP, Access Class, UE-AMBR, and APN-AMBR.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-85-F	Since the NPSBN could also support secondary users, default QoS profile templates should be defined for public safety and secondary users.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-86-F	Every user of the NPSBN (public safety and secondary users) should be assigned a default prioritization and QoS profile using the set of pre-defined QoS profile templates.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>

Statement of Objective/ FCC TAB Item	Item Summary	IOC and/or FOC Milestone to be Validated In
FCC-001-87-F	A process should be established and followed to manage the assignment of templates to users to ensure template assignment rules are uniformly applied for all users using the NPSBN.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-88-F	FirstNet should make an API available to national, regional, and local applications to expose Priority and QoS control.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-89-F	The NPSBN security implementation should include pre-planned bypass mechanisms that have defined security and interoperability implications.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-90-F	Equipment used in the NPSBN should support AES and SNOW 3G algorithms.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-91-F	FirstNet should establish the security controls and policy for inter-domain security and require that all parties (e.g., public safety agencies) that connect to the NPSBN utilize FirstNet-approved cipher suites.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-92-F	FirstNet should consider using IPSec interfaces that utilize IKEv2 and utilize PKI to authenticate the peers of the IPSec security associations.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-93-F	When EPS elements are located in trusted locations without wide area communication links between them, the use of network domain security should be optional.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-94-F	Network interfaces between domains should be monitored and intrusion detection/prevention tools should be deployed.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-95-F	The developed security mechanisms should permit local entities to hide the topologies and address spaces of their networks.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-96-F	Security mechanisms layered by a jurisdiction on top of the NPSBN should not inhibit interoperability for users visiting from outside of the security domain in which it is implemented.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>

Statement of Objective/ FCC TAB Item	Item Summary	IOC and/or FOC Milestone to be Validated In
FCC-001-97-F	As FirstNet enters into roaming agreements with commercial partners, security policies should be implemented that ensure integrity of the NPSBN and ensure that NPSBN security practices are not compromised.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-98-F	FirstNet should consider supporting implementation of a national framework for user identity management.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-99-F	FirstNet should consider supporting implementation of a national framework for user identity federation to enable user interoperability across administrative domains within the NPSBN, where authorized.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-100-F	Implementation of the national framework for user identity management and federation should include a set of guidelines and rules for applications to participate in the national identity management framework.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>
FCC-001-101-F	The agency, organization or entity that utilizes the NPSBN identity management framework should be responsible for enforcing authorization constraints on access to information as per their own security policy.	<i>< List IOC/FOC phase this SOO or FCC TAB item will be validated. Example: IOC-1, IOC-2, IOC-5 and FOC and/or any combination.></i>

2.1.1 User Equipment Test Strategy

<Describe the UE test strategy here. Topics to address include but are not limited to UE certification, UE-RAN Interoperability (IOT), Wi-Fi Connectivity, Bluetooth Connectivity, Battery Certification, Carrier Acceptance Testing, etc.>

2.1.2 RAN Test Strategy

<Describe the RAN test strategy here. Topics to address include but are not limited to conformance testing, commissioning, certification testing, RAN-EPC IOT testing, backhaul testing, how Band 14 coverage objectives specified in the IOC/FOC Target Timeline (Section J, Attachment J-8) will be tested, how hardening and resiliency will be tested, etc. >

2.1.3 EPS and IP Multimedia Subsystem Test Strategy

<Describe the EPS and IP Multimedia Subsystem test strategy here. Topics to address include but are not limited to sub-system testing, EPS and IP Multimedia Subsystem interface conformance testing, EPS and IP Multimedia Subsystem load testing, EPS and IP Multimedia Subsystem vulnerability testing, how hardening and resiliency will be tested, etc.>

2.1.4 Network Services Test Strategy

<Describe the Network Services test strategy here. Topics to address include but are not limited to Location-Based Services (LBS) testing, messaging services (SMS, MMS) testing, and VoLTE and RCS testing.>

2.1.5 Application Test Strategy

<Describe the Application test strategy here. Topics to address include but are not limited to application certification; application testing; Mobile Device Management server functionality; application security testing; federated Identity, Credential, and Access Management (ICAM) testing; application resiliency testing; application interaction testing; application performance testing; application/device interoperability testing; application battery life testing; application infrastructure testing; application server load testing; etc.>

2.1.6 Operational Support System and Business Support System Test Strategy

<Describe the OSS and BSS test strategy here. Topics to address include but are not limited to alarming, alarm management, billing, etc.>

<As part of the OSS and BSS test strategy, describe creation, maintenance, and support of a network operation connection and quality assurance monitoring of FirstNet NPSBN performance Key Performance Indicators (KPIs) at the FirstNet technical headquarters.>

2.1.7 End to End Regression Test Strategy

<Describe the end-to-end regression test strategy here. Topics to address include overall end-to-end regression testing for each IOC and FOC, etc.>

2.2 Interim Operational Capability (IOC) Test

2.2.1 IOC-1

< Describe the IOC-1 test configurations for the laboratory, field, and First Office Application (FOA). The Offeror should show how select Public Safety Enterprise Network (PSEN) configuration(s) will be included in the FOA. Provide high-level block diagrams for each test configuration.

Describe the entrance criteria to IOC-1 by completing the table below. IOC-1 testing can not begin until the entrance criteria are met. Also, as part of the entry criteria, describe what test reports are required before performing this IOC.>

Table 2 IOC-1 Entry Criteria

Entry Criteria	Description
<Example: IOC-1 System Level Test Plans/Procedures>	<Example: Test plans and procedures have been reviewed, accepted, and are available.>
<Example: Software Release>	<Example: General Availability (GA) Quality Software Load with X% System Test Pass Rate>
<Example: Defect Report>	<Example: List of outstanding high severity defects and timeline as to when the defects will be resolved.>
<Add additional entry criteria items here>	<Add description of entry criteria here>
<...>	<...>
<Add additional entry criteria items here>	<Add description of entry criteria here>

<Describe how each item that was identified as being tested in IOC-1 in Table 1 FirstNet Statement of Objectives and FCC TAB Item Mapping to IOC/FOC Milestones above will be verified by completing the table below.>

Table 3 IOC-1 Description of Verification Strategy Per Item

Statement of Objective/FCC TAB Item #	Description of Verification Strategy	Test Location (OL = Offeror Lab; OF = Offeror Field; PSEN = PS Enterprise Network; FNL = FirstNet Lab; Other = TBD by Offeror)
<Add SOO Section #/FCC TAB Item # here>	<Add brief verification strategy here> 1. <Add verification items for this SOO/FCC TAB item here in number bullet form> 2.	<Identify Test Location Per Verification Strategy> 1. <Add Test Location(s) OL, OF, PSEN, FNL, and/or Other for each verification item> 2.
<...>	<...>	<...>

Statement of Objective/FCC TAB Item #	Description of Verification Strategy	Test Location (OL = Offeror Lab; OF = Offeror Field; PSEN = PS Enterprise Network; FNL = FirstNet Lab; Other = TBD by Offeror)
<Add SOO Section #/FCC TAB Item # here>	<Add brief verification strategy here> 1. <Add verification items for this SOO/FCC TAB item here in number bullet form> 2.	<Identify Test Location Per Verification Strategy> 1. <Add Test Location(s) OL, OF, PSEN, FNL, and/or Other for each verification item> 2.

<Describe the exit criteria for IOC-1 by completing the table below.>

Table 4 IOC-1 Exit Criteria

Exit Criteria	Description	Projected Availability
<Example: IOC-1 Testing Complete>	<Example: IOC-1 Final Test Report. This final test report will be composed of three separate reports for each of the three test environments (lab, field, and FOA). Offeror(s) will create the initial draft IOC-1 test report and submit to FirstNet for comment and review. In each test report, Offeror(s) will clearly summarize which test cases passed or failed and any outstanding defects.>	<Example: 30 days after test completion>
<Example: IOC-1 Final Defect Report>	<Example: Offeror(s) to summarize the remaining critical, major, minor defects and proposal to resolve outstanding defects.>	<Example: 30 days after test completion>
<...>	<...>	<...>
<Add exit criteria here>	<Add exit criteria description here>	<Add projected availability here>

2.2.2 IOC-2

<Describe the IOC-2 test configurations for the laboratory, field, and FOA. The Offeror should show how select PSEN configuration(s) will be included in the FOA. Provide high-level block diagrams for each test configuration.>

Describe the entrance criteria to IOC-2 by completing the table below. IOC-2 testing can not begin until the entrance criteria is met. Also, as part of the entry criteria, describe what test reports are required before performing this IOC.>

Table 5 IOC-2 Entry Criteria

Entry Criteria	Description
<Example: IOC-2 System Level Test Plans/Procedures>	<Example: Test plans and procedures have been reviewed, accepted, and are available.>
<Example: Software Release>	<Example: General Availability (GA) Quality Software Load with X% System Test Pass Rate>
<Example: Defect Report>	<Example: List of outstanding high severity defects and timeline as to when the defects will be resolved.>
<Add additional entry criteria items here>	<Add description of entry criteria here>
<...>	<...>

Entry Criteria	Description
<Add additional entry criteria items here>	<Add description of entry criteria here>

<Describe how each item that was identified as being tested in IOC-2 in Table 1 FirstNet Statement of Objectives and FCC TAB Item Mapping to IOC/FOC Milestones above will be verified by completing the table below.>

Table 6 IOC-2 Description of Verification Strategy Per Item

Statement of Objective/FCC TAB Item #	Description of Verification Strategy	Test Location (OL = Offeror Lab; OF = Offeror Field; PSEN = PS Enterprise Network; FNL = FirstNet Lab; Other = TBD by Offeror)
<Add SOO Section #/FCC TAB Item # here>	<Add brief verification strategy here> 1. <Add verification items for this SOO/FCC TAB item here in number bullet form> 2.	<Identify Test Location Per Verification Strategy> 1. <Add Test Location(s) OL, OF, PSEN, FNL, and/or Other for each verification item> 2.
<...>	<...>	<...>
<Add SOO Section #/FCC TAB Item # here>	<Add brief verification strategy here> 1. <Add verification items for this SOO/FCC TAB item here in number bullet form> 2.	<Identify Test Location Per Verification Strategy> 1. <Add Test Location(s) OL, OF, PSEN, FNL, and/or Other for each verification item> 2.

<Describe the exit criteria for IOC-2 by completing the table below.>

Table 7 IOC-2 Exit Criteria

Exit Criteria	Description	Projected Availability
<Example: IOC-2 Testing Complete>	<Example: IOC-2 Final Test Report. This final test report will be composed of three separate reports for each of the three test environments (lab, field, and FOA). Offeror(s) will create the initial draft IOC-2 test report and submit to FirstNet for comment and review. In each test report, the Offeror will clearly summarize which test cases passed or failed and any outstanding defects.>	<Example: 30 days after test completion>
<Example: IOC-2 Final Defect Report>	<Example: Offeror(s) to summarize the remaining critical, major, minor defects and proposal to resolve outstanding defects.>	<Example: 30 days after test completion>
<...>	<...>	<...>
<Add exit criteria here>	<Add exit criteria description here>	<Add projected availability here>

2.2.3 IOC-3

<Describe the IOC-3 test configurations for the laboratory, field, and FOA. The Offeror should show how select PSEN configuration(s) will be included in the FOA. Provide high-level block diagrams for each test configuration.>

Describe the entrance criteria to IOC-3 by completing the table below. IOC-3 testing can not begin until the entrance criteria is met. Also, as part of the entry criteria, describe what test reports are required before performing this IOC.>

Table 8 IOC-3 Entry Criteria

Entry Criteria	Description
<Example: IOC-3 System Level Test Plans/Procedures>	<Example: Test plans and procedures have been reviewed, accepted, and are available.>
<Example: Software Release>	<Example: General Availability (GA) Quality Software Load with X% System Test Pass Rate>
<Example: Defect Report>	<Example: List of outstanding high severity defects and timeline as to when the defects will be resolved.>
<Add additional entry criteria items here>	<Add description of entry criteria here>
<...>	<...>
<Add additional entry criteria items here>	<Add description of entry criteria here>

<Describe how each item that was identified as being tested in IOC-3 in Table 1 FirstNet Statement of Objectives and FCC TAB Item Mapping to IOC/FOC Milestones above will be verified by completing the table below.>

Table 9 IOC-3 Description of Verification Strategy Per Item

Statement of Objective/FCC TAB Item #	Description of Verification Strategy	Test Location (OL = Offeror Lab; OF = Offeror Field; PSEN = PS Enterprise Network; FNL = FirstNet Lab; Other = TBD by Offeror)
<Add SOO Section #/FCC TAB Item # here>	<Add brief verification strategy here> 1. <Add verification items for this SOO/FCC TAB item here in number bullet form> 2.	<Identify Test Location Per Verification Strategy> 1. <Add Test Location(s) OL, OF, PSEN, FNL, and/or Other for each verification item> 2.
<...>	<...>	<...>
<Add SOO Section #/FCC TAB Item # here>	<Add brief verification strategy here> 1. <Add verification items for this SOO/FCC TAB item here in number bullet form> 2.	<Identify Test Location Per Verification Strategy> 1. <Add Test Location(s) OL, OF, PSEN, FNL, and/or Other for each verification item> 2.

<Describe the exit criteria for IOC-3 by completing the table below.>

Table 10 IOC-3 Exit Criteria

Exit Criteria	Description	Projected Availability
<Example: IOC-3 Testing Complete>	<i><Example: IOC-3 Final Test Report. This final test report will be composed of three separate reports for each of the three test environments (lab, field, and FOA). Offeror(s) will create the initial draft IOC-3 test report and submit to FirstNet for comment and review. In each test report, the Offeror will clearly summarize which test cases passed or failed and any outstanding defects.></i>	<i><Example: 30 days after test completion></i>
<Example: IOC-3 Final Defect Report>	<i><Example: Offeror(s) to summarize the remaining critical, major, minor defects and proposal to resolve outstanding defects.></i>	<i><Example: 30 days after test completion></i>
<i><...></i>	<i><...></i>	<i><...></i>
<Add exit criteria here>	<i><Add exit criteria description here></i>	<i><Add projected availability here></i>

2.2.4 IOC-4

<Describe the IOC-4 test configurations for the laboratory, field, and FOA. The Offeror should show how select PSEN configuration(s) will be included in the FOA. Provide high-level block diagrams for each test configuration.

Describe the entrance criteria to IOC-4 by completing the table below. IOC-4 testing can not begin until the entrance criteria is met. Also, as part of the entry criteria, describe what test reports are required before performing this IOC.>

Table 11 IOC-4 Entry Criteria

Entry Criteria	Description
<Example: IOC-4 System Level Test Plans/Procedures>	<i><Example: Test plans and procedures have been reviewed, accepted, and are available.></i>
<Example: Software Release>	<i><Example: General Availability (GA) Quality Software Load with X% System Test Pass Rate></i>
<Example: Defect Report>	<i><Example: List of outstanding high severity defects and timeline as to when the defects will be resolved.></i>
<Add additional entry criteria items here>	<i><Add description of entry criteria here></i>
<i><...></i>	<i><...></i>
<Add additional entry criteria items here>	<i><Add description of entry criteria here></i>

<Describe how each item that was identified as being tested in IOC-4 in Table 1 FirstNet Statement of Objectives and FCC TAB Item Mapping to IOC/FOC Milestones above will be verified by completing the table below.>

Table 12 IOC-4 Description of Verification Strategy Per Item

Statement of Objective/FCC TAB Item #	Description of Verification Strategy	Test Location (OL = Offeror Lab; OF = Offeror Field; PSEN = PS Enterprise Network; FNL = FirstNet Lab; Other=TBD by Offeror)
<Add SOO Section #/FCC TAB Item # here>	<Add brief verification strategy here> 1. <Add verification items for this SOO/FCC TAB item here in number bullet form> 2.	<Identify Test Location Per Verification Strategy> 1. <Add Test Location(s) OL, OF, PSEN, FNL, and/or Other for each verification item> 2.
<...>	<...>	<...>
<Add SOO Section #/FCC TAB Item # here>	<Add brief verification strategy here> 1. <Add verification items for this SOO/FCC TAB item here in number bullet form> 2.	<Identify Test Location Per Verification Strategy> 1. <Add Test Location(s) OL, OF, PSEN, FNL, and/or Other for each verification item> 2.

<Describe the exit criteria for IOC-4 by completing the table below.>

Table 13 IOC-4 Exit Criteria

Exit Criteria	Description	Projected Availability
<Example: IOC-4 Testing Complete>	<Example: IOC-4 Final Test Report. This final test report will be composed of three separate reports for each of the three test environments (lab, field, and FOA). Offeror(s) will create the initial draft IOC-4 test report and submit to FirstNet for comment and review. In each test report, the Offeror will clearly summarize which test cases passed or failed and any outstanding defects.>	<Example: 30 days after test completion>
<Example: IOC-4 Final Defect Report>	<Example: Offeror(s) to summarize the remaining critical, major, minor defects and proposal to resolve outstanding defects.>	<Example: 30 days after test completion>
<...>	<...>	<...>
<Add exit criteria here>	<Add exit criteria description here>	<Add projected availability here>

2.2.5 IOC-5

<Describe the IOC-5 test configurations for the laboratory, field, and FOA. The Offeror should show how select PSEN configuration(s) will be included in the FOA. Provide high-level block diagrams for each test configuration.>

Describe the entrance criteria to IOC-5 by completing the table below. IOC-5 testing can not begin until the entrance criteria are met. Also, as part of the entry criteria, describe what test reports are required before performing this IOC.>

Table 14 IOC-5 Entry Criteria

Entry Criteria	Description
<Example: IOC-5 System Level Test Plans/Procedures>	<i><Example: Test plans and procedures have been reviewed, accepted, and are available.></i>
<Example: Software Release>	<i><Example: General Availability (GA) Quality Software Load with X% System Test Pass Rate></i>
<Example: Defect Report>	<i><Example: List of outstanding high severity defects and timeline as to when the defects will be resolved.></i>
<Add additional entry criteria items here>	<i><Add description of entry criteria here></i>
<...>	<i><...></i>
<Add additional entry criteria items here>	<i><Add description of entry criteria here></i>

<Describe how each item that was identified as being tested in IOC-5 in Table 1 FirstNet Statement of Objectives and FCC TAB Item Mapping to IOC/FOC Milestones above will be verified by completing the table below.>

Table 15 IOC-5 Description of Verification Strategy Per Item

Statement of Objective/FCC TAB Item #	Description of Verification Strategy	Test Location (OL = Offeror Lab; OF = Offeror Field; PSEN = PS Enterprise Network; FNL = FirstNet Lab; Other=TBD by Offeror)
<Add SOO Section #/FCC TAB Item # here>	<i><Add brief verification strategy here></i> 1. <i><Add verification items for this SOO/FCC TAB item here in number bullet form></i> 2.	<i><Identify Test Location Per Verification Strategy></i> 1. <i><Add Test Location(s) OL, OF, PSEN, FNL, and/or Other for each verification item></i> 2.
<...>	<i><...></i>	<i><...></i>
<Add SOO Section #/FCC TAB Item # here>	<i><Add brief verification strategy here></i> 1. <i><Add verification items for this SOO/FCC TAB item here in number bullet form></i> 2.	<i><Identify Test Location Per Verification Strategy></i> 1. <i><Add Test Location(s) OL, OF, PSEN, FNL, and/or Other for each verification item></i> 2.

<Describe the exit criteria for IOC-5 by completing the table below.>

Table 16 IOC-5 Exit Criteria

Exit Criteria	Description	Projected Availability
<Example: IOC-5 Testing Complete>	<i><Example: IOC-5 Final Test Report. This final test report will be composed of three separate reports for each of the three test environments (lab, field, and FOA). Offeror(s) will create the initial draft IOC-5 test report and submit to FirstNet for comment and review. In each test report, the Offeror will clearly summarize which test cases passed or failed and any outstanding defects.></i>	<i><Example: 30 days after test completion></i>
<Example: IOC-5 Final Defect Report>	<i><Example: Offeror(s) to summarize the remaining critical, major, minor defects and proposal to resolve outstanding defects.></i>	<i><Example: 30 days after test completion></i>
<...>	<...>	<...>
<Add exit criteria here>	<Add exit criteria description here>	<Add projected availability here>

2.3 Final Operational Capability (FOC) Test

<FOC test is intended to evaluate the readiness for the FirstNet service offering to deliver the final operational capability planned for the NPSBN. This final operational capability test stage will review various aspects of FCC TAB and SOO as final verification that all required system features and functionality have been delivered.>

Describe the FOC test configurations for the laboratory, field, and FOA. The Offeror should show how select PSEN configuration(s) will be included in the FOA. Provide high-level block diagrams for each test configuration.

Describe the entrance criteria to FOC by completing the table below. FOC testing can not begin until the entrance criteria are met. Also, as part of the entry criteria, describe what test reports are required before performing this FOC.>

Table 17 FOC Entry Criteria

Entry Criteria	Description
<Example: FOC System Level Test Plans/Procedures>	<i><Example: Test plans and procedures have been reviewed, accepted, and are available.></i>
<Example: Software Release>	<i><Example: General Availability (GA) Quality Software Load with X% System Test Pass Rate></i>
<Example: Defect Report>	<i><Example: List of outstanding high severity defects and timeline as to when the defects will be resolved.></i>
<Add additional entry criteria items here>	<Add description of entry criteria here>
<...>	<...>
<Add additional entry criteria items here>	<Add description of entry criteria here>

<Describe how each item that was identified as being tested in FOC in Table 1 FirstNet Statement of Objectives and FCC TAB Item Mapping to IOC/FOC Milestones above will be verified by completing the table below.>

Table 18 FOC Description of Verification Strategy Per Item

Statement of Objective/FCC TAB Item #	Description of Verification Strategy	Test Location (OL = Offeror Lab; OF = Offeror Field; PSEN = PS Enterprise Network; FNL = FirstNet Lab; Other=TBD by Offeror)
<Add SOO Section #/FCC TAB Item # here>	<Add brief verification strategy here> 1. <Add verification items for this SOO/FCC TAB item here in number bullet form> 2.	<Identify Test Location Per Verification Strategy> 1. <Add Test Location(s) OL, OF, PSEN, FNL, and/or Other for each verification item> 2.
<...>	<...>	<...>
<Add SOO Section #/FCC TAB Item # here>	<Add brief verification strategy here> 1. <Add verification items for this SOO/FCC TAB item here in number bullet form> 2.	<Identify Test Location Per Verification Strategy> 1. <Add Test Location(s) OL, OF, PSEN, FNL, and/or Other for each verification item> 2.

<Describe the exit criteria for FOC by completing the table below.>

Table 19 FOC Exit Criteria

Exit Criteria	Description	Projected Availability
<Example: FOC Testing Complete>	<Example: FOC Final Test Report. This final test report will be composed of three separate reports for each of the three test environments (lab, field, and FOA). Offeror(s) will create the initial draft FOC test report and submit to FirstNet for comment and review. In each test report, the Offeror will clearly summarize which test cases passed or failed and any outstanding defects.>	<Example: 30 days after test completion>
<Example: FOC Final Defect Report>	<Example: Offeror(s) to summarize the remaining critical, major, minor defects and proposal to resolve outstanding defects.>	<Example: 30 days after test completion>
<...>	<...>	<...>
<Add exit criteria here>	<Add exit criteria description here>	<Add projected availability here>

2.4 Post FOC Testing

<Once FOC testing has been completed, FirstNet will reach a stable state where it carries out daily operations, which is referred to as “Post FOC.” The purpose of this section is for the Offeror to describe the Post FOC testing strategy including but not limited to regression testing, new feature testing, FOA testing, Radio Frequency (RF) system optimization, carrier acceptance of new devices, carrier acceptance

of new applications, etc. In addition, the Offeror should consider describing their approach to performing quality assurance and surveillance on the operational network.>

3 Test Strategy Schedule and Test Management

3.1 Test Planning and Execution Schedule

<The Offeror to describe how FirstNet would be included in IOC and FOC test plan and procedure reviews and the frequency of such reviews. The Offeror also to describe the IOC and FOC test planning and execution timeline in the form of a Gantt Chart, which includes test plan development, procedure reviews, and test execution.>

3.2 Test Data Management

<The Offeror to briefly describe how test data (test case results) will be archived and preserved for each IOC, FOC, and post-FOC. This includes discussing the data retention policy.>

4 Equipment, Test Tools, and Training

<The Offeror to describe network equipment, test equipment, test tools, and training to be provided per IOC/FOC in the Offeror Lab (OL), Offeror Field (OF) Environment, at the PSEN, and in the FirstNet laboratory in Boulder, Colorado, including:

- Installation and configuration of any hardware, software and test tools necessary to execute public safety feature acceptance test plans and cases.*
- Hardware and software installation, upgrades, configuration, maintenance, licensing, and repair of the Offeror's installed or interconnected lab equipment.*
- Maintenance plan for current and spare equipment inventory for the Offeror's installed or interconnected lab equipment.*
- Training and support for FirstNet staff to execute FirstNet's own public safety feature quality assurance test plan.>*