BEFORE THE SOUTH DAKOTA PUBLIC UTILITIES COMMISSION

In the Matter of the Application of)
)

NGA 911, L.L.C.)
)   Docket No. TC19-003

for Certificates of Authority)
to Provide Resold and Facilities-Based)
Local Exchange and Interexchange)
Telecommunications Services in the)
State of South Dakota)

EXHIBIT DR1-3

Description of Facilities

I. TECHNICAL AND NETWORK RESOURCES AND CAPABILITIES

1. Provide a complete and detailed description (including all pertinent technical specifications) of network facilities Applicant intends to utilize to provide 9-1-1 services, IP-based services, or a combinations of both.

   NGA 911 will rely on a number of different network and infrastructure facilities for the provisioning of a combination of both 9-1-1 services and IP-based services (NG9-1-1). These can be characterized as Ingress, ESInet, Cloud, Direct Connect, and PSAP based.

   The NGA 911's solution utilizes a diverse, redundant, secure IP infrastructure. Facilities and nodes are geographically diverse and are equipped with physically redundant data communications and power equipment that allow for continuous operation and reliability. The Company Network Elements are described below and are referenced in the Network Element Diagram in this Section.
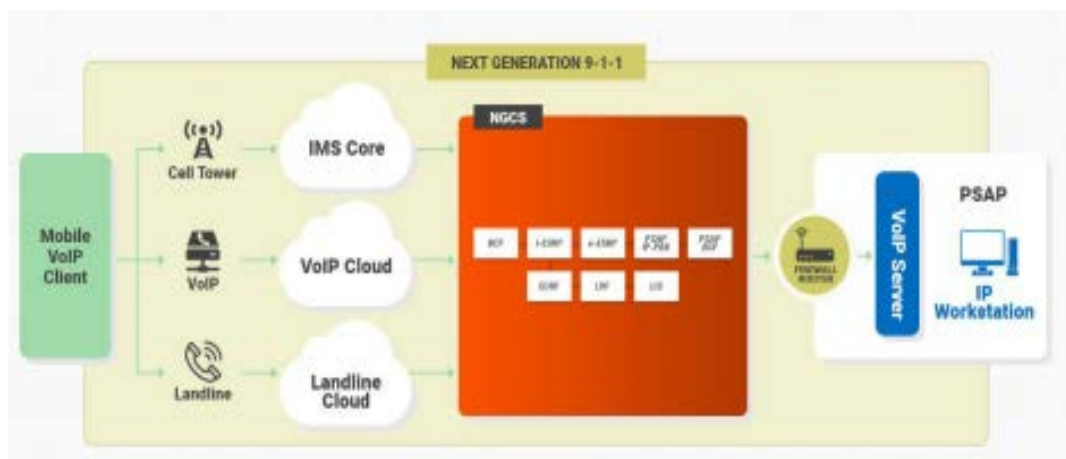
Next Generation 9-1-1(NG9-1-1) EMERGENCY SERVICES

NG9-1-1 Emergency Services means a secure, IP-based, open-standards system comprised of hardware, software, data, Next Generation Core Service (NGCS) Functional Element (FE), and operational policies and procedures.

NGCS FE

Any of the components of the NENA i3 specification that provide defined functions in delivering geospatial routing of 9-1-1 Calls. These include but are not limited to Emergency Services Routing Proxy (ESRP), Emergency Call Routing Function (ECRF), Location Validation Function (LVF), Border Control Function (BCF), Spatial Interface (SI), Policy Store, and i3 Logging Services.

NGCS

The base set of services needed to process a 9-1-1 Call using the standards and interfaces of i3. These services are enabled by the NGCS FE ESRP, ECRF, LVF, BCF, Bridge, Policy Store, Logging Services and typical IP services such as Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP). The term NGCS includes the services and not the network on which they operate. See ESInet.

ECRF

A functional element in an ESInet which is a Location-to-Service Translation (LoST) protocol server where location information (either civic address or geo-coordinates) and a Service Uniform Resource Name (URN) serve as input to a mapping function that returns a Uniform Resource Identifier (URI) used to route an emergency Call toward the appropriate Public Safety Answering Point (PSAP) for the caller's location or towards a responder agency.

THE ECRF/LVF

The ECRF accurately routes 9-1-1 calls to the appropriate PSAP based on the caller's location. In a NG9-1-1 system, the ECRF along with the LVF replace the current Master Street Addressing Guide.

BCF

The BCF provides a secure entry into the ESInet for emergency calls presented to the network. The BCF incorporates firewall, admission control, and may include anchoring of session and media as well as other security mechanisms to prevent deliberate or malicious attacks on PSAPs or other entities connected to the ESInet. After a routing decision has been made by the BCF at the edge of NGCS it is handed over to the PSAP.

i3 LOGGING

An event and media logger. The Logging Service accepts log event records and media streams in a standardized form, stores them, and provides a standardized retrieval function for these records.

NG9-1-1 CALL ROUTING SERVICE FEATURES

NG9-1-1 CALL ROUTING

The Company's NG9-1-1 Routing Service is a secure, Public Safety Grade (PSG), IP-based, open standards system, dedicated managed network that provides FEs for i3 advanced 9-1-1 call routing operations. The NG9-1-1 Routing Service delivers emergency Calls from both traditional and non-traditional voice networks. In addition to processing traditional TDM voice traffic, NG9-1-1 Routing Service also provides IP based Call processing capabilities. The NG9-1-1 Routing Service processes all types of emergency calls, including voice, text, data, and multimedia information; acquires and integrates additional emergency call data useful to call routing and handling; delivers the emergency calls, messages, and data to the appropriate PSAP and other appropriate emergency entities based on the location of the caller; supports voice, data, video, text, and other communications needs for coordinated incident response and management; and interoperates with services and networks used by first responders to facilitate emergency

response. NG9-1-1 Call Routing provides real-time routing information to the PSAP when a route can be derived from the underlying geospatial street centerline database or route to the prescribed default location. NG9-1-1 call routing supports Wireline, Wireless, and VoIP calls.

The Customer has the ability to report, capture, and designate specific instructions for handling each of the following Call types: Wireline, Wireless, and VoIP calls.

GEOSPATIAL ROUTING

Geospatial Routing is emergency call routing to the appropriate PSAP or other designated destination based on the caller's location, call characteristics, GIS data, and pre-defined policies to the appropriate PSAP. Geospatial Routing must relate or map the civic address to a location in the GIS database that can be intersected with service area boundaries to identify the target PSAP. The ECRF interfaces with the ESRP using Presence Information Data Format Location Object (PIDF-LO) and provides real-time routing information to the PSAP when a route can be derived from the underlying geospatial street centerline database or route to the prescribed default location.

Location may be provided in the form of geo coordinates (longitude and latitude). Location may be conveyed to the system that performs the selective routing function in the form of ANI or pseudo-ANI associated with a preloaded ALI database record (in Legacy 9-1-1 systems), or in real time in the form of a Presence Information Data Format – Location Object (PIDFLO) (in NG9-1-1 systems) or whatever forms are developed as 9-1-1 continues to evolve.

ESRP

The ESRP is the first routing element within the NGCS. An i3 functional element that selects the next hop routing within the ESInet based on location and policy. There is an ESRP on the edge of the ESInet. There is usually an ESRP at the entrance to a NG9-1-1 PSAP. There may be one or more intermediate ESRPs between them.

· Originating ESRP: It receives calls from the BCF at the edge of the ESInet.

· Terminating ESRP: The last ESRP for a call in NGCS.

PRF

The PRF is a functional component of an ECRP that determines the target PSAP using predetermined rules based on location and policies set forth by the PSAP. PRF policies are customizable by each agency for alternate or secondary routes and transmission of 9-1-1 calls when the primary route between NGCS and the PSAP is "traffic busy" where the PSAP is either temporarily out of service or overloaded with calls. PRF policies are compliant to the NENA defined policy definitions and format.   The ESRP is the selective router for NG9-1-1, performs IP routing of all calls through the NG9-1-1 system and is managed and controlled by a PRF which utilized multiple FE's to make routing decisions.

LIS

A LIS is a functional element in an IP-capable originating network that provides locations of endpoints (i.e., calling device). A LIS can provide Location by-Reference, or Location-by-Value, and, if the latter, in geo or civic forms. A LIS can be queried by an endpoint for

its own location, or by another entity for the location of an endpoint. In either case, the LIS receives a unique identifier that represents the endpoint, for example an IP address, circuit-ID or Media Access Control (MAC) address and returns the location (value or reference) associated with that identifier. The LIS is also the entity that provides the dereferencing service, exchanging a location reference for a location value.

Must validate civic locations information placed in its LIS using a LVF.

- Anytime a civic location is changed in a LIS, such as a street name change, building name change, or any other modification of a civic location, must validate the proposed update to the civic location against the LVF data.

LDB

The LDB server retains much of the current information, functionality, and interfaces of today's ALI and can utilize the currently defined i3 protocols required in a NG9-1-1 deployment. The LDB integrates with existing E9-1-1 and NG9-1-1 infrastructure, supporting current and future versions of location validation, emergency call routing and location-based call routing. The LDB consists of database and database management software.

LoST PROTOCOL

A functional element in an ESInet which is a LoST protocol server where location information (either civic address or geo-coordinates) and a Service URN serve as input to a mapping function that returns a URI used to route an emergency call toward the appropriate PSAP for the caller's location or towards a responder agency.

A protocol that takes location information and a Service URN and returns a URI. Used generally for location-based Call Routing. In NG9-1-1, used as the protocol for the ECRF, and LVF.

ABANDONMENT ROUTING

If a situation arises where a PSAP must be closed or evacuated, this feature provides specific routing instructions for delivery of Calls to recovery locations.

GIS FUNCTIONAL ELEMENTS (FE)

The ECRF, identifies the correct PSAP for incident handling and enables dispatching first responders to the correct location in the quickest possible time.

To accomplish its function, the ECRF uses qualified geospatial streets and address databases to geocode civic addresses and Lat/Longs and transforms them into a PSAP URN to establish the primary PSAP routable location. The ECRF provides geolocation information to PSAPs and first responders. Using Lat/Long or civic address information, the ECRF queries access geocoding functionality and PSAP location data to produce validated URI routes.

The ECRF depends upon a geospatial data model resident in the authoritative production database and is a system for capturing, storing, displaying, analyzing and managing data and associated attributes which are spatially referenced.

SI

SI is the interface between the GIS provided information and the functional elements that consume GIS data, such as the ECRF, and/or LVF.

LVF

A functional element in a NGCS is a LoST protocol server where civic location information is validated against the authoritative GIS database information. A civic address is considered valid if it can be located within the database uniquely, is suitable to provide an accurate route for an emergency Call, adequate and specific enough to direct responders to the right location.

The ESInet

An ESInet is a managed IP network that is used for emergency services communications, and which can be shared by all public safety agencies. It provides the IP transport infrastructure upon which independent application platforms and core services can be deployed, including, but not restricted to, those necessary for providing NG9-1-1 services. ESInets may be constructed from a mix of dedicated and shared facilities. ESInets may be interconnected at local, regional, state, federal, national and international levels to form an IP-based inter-network (network of networks). The term ESInet designates the network, not the services that ride on the network.

Ingress Facilities are the locations where various Originating Service Providers (wireline, wireless, VoIP, and IoT) are aggregated. When an ESInet is not available to terminate at the Customer CPE an Originating Service Providers (OSP) shall connect TDM traffic to the Company's LNG as specified by the Company at the OSP Point of Interconnection (POI) or a Company defined Meet Point within the Incumbent Local Exchange Carrier network. OSP originated SIP traffic must terminate at the OSP POI of the Company specified data centers.
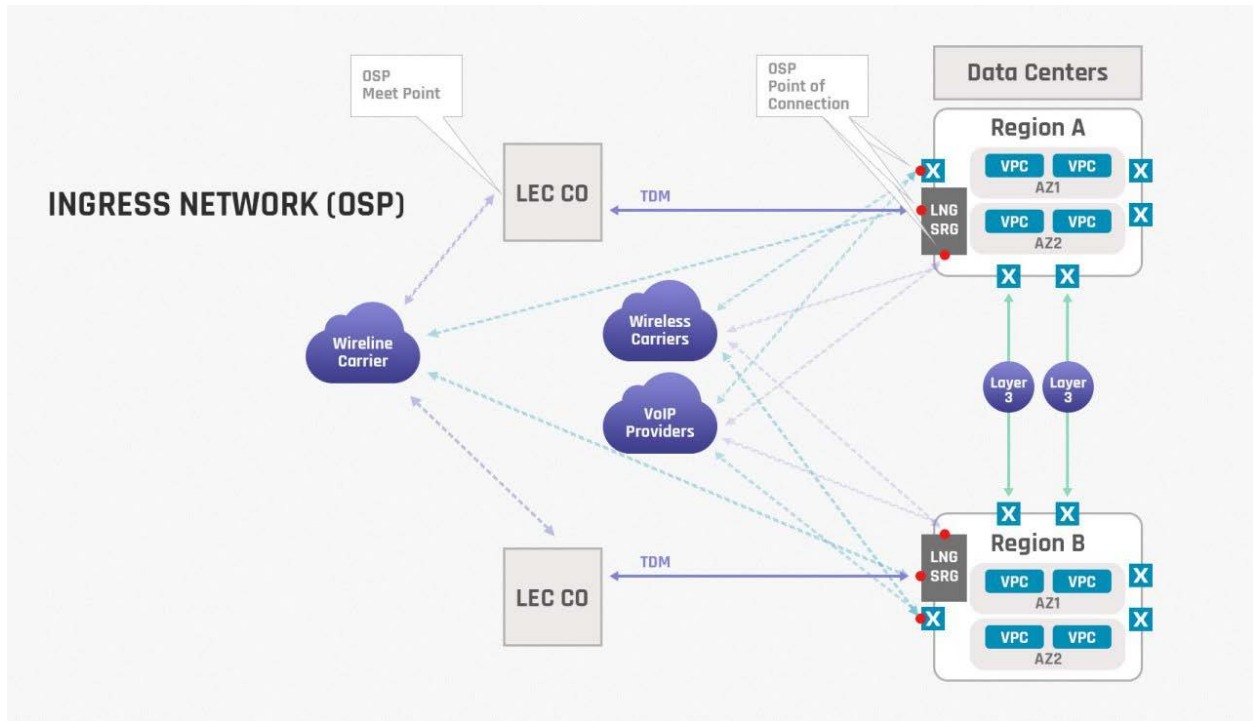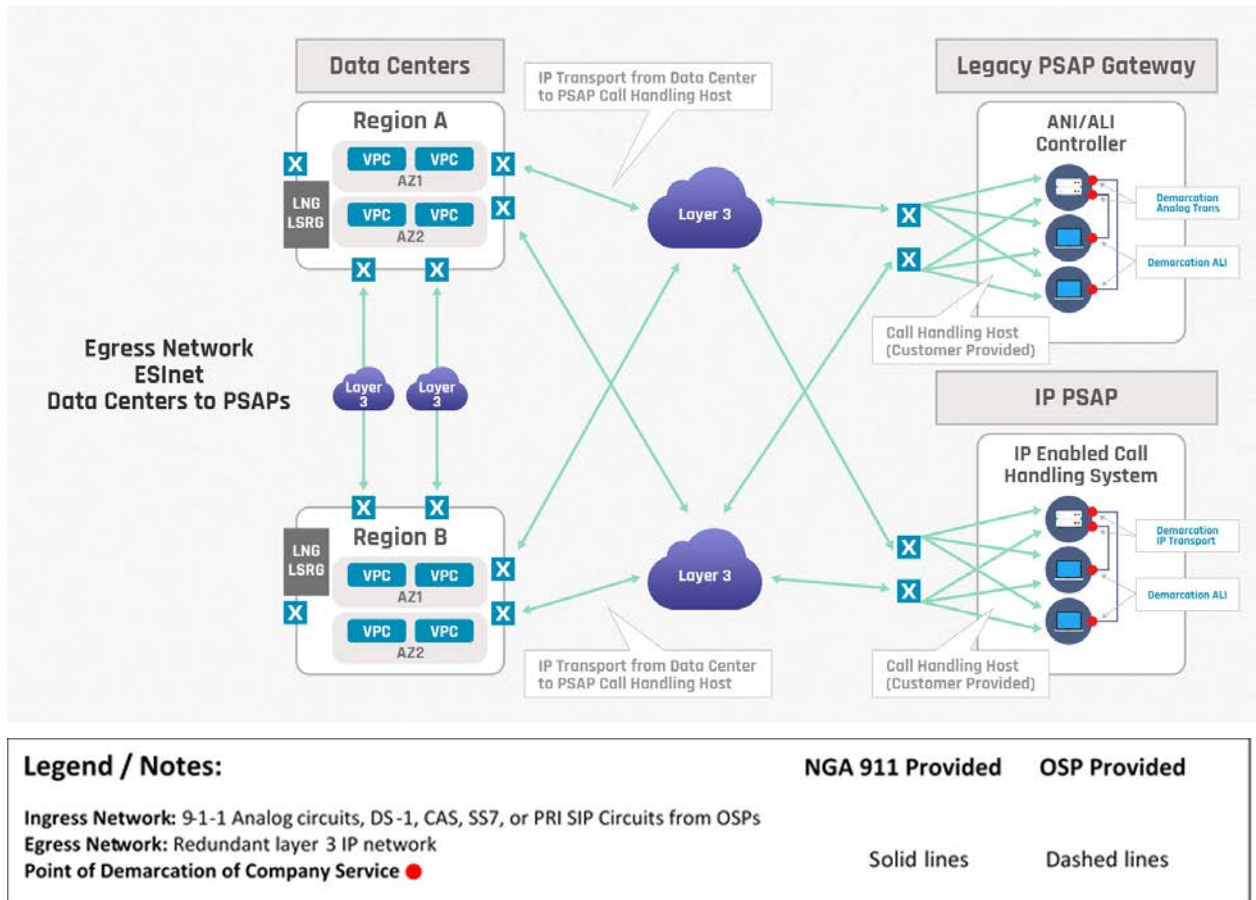
Legend / Notes:

Ingress Network: 9-1-1 Analog circuits, DS-1, CAS, SS7, or PRI SIP Circuits from OSPs
Egress Network: Redundant layer 3 IP network
Point of Demarcation of Company Service ●

	NGA 911 Provided	OSP Provided
	Solid lines	Dashed lines

EGRESS NETWORK

The Company will terminate its IP transport to:

1) the Legacy PSAP Gateway where the PSAP 9-1-1 analog trunks terminate or when the Company is to connect to an IP enabled Call Handling System, the Company will terminate its IP transport,

2) to the IP router serving the IP enabled Call Handling System. Legacy PSAP Gateways are offered separately via ICB arrangements. 3.2.1 The Company will provide IP Transport from Data Center to the PSAP's Call Handling System Host or Gateway. The IP network connects the Data Center to the Call Handling System Host.

Legend / Notes:

Ingress Network: 9-1-1 Analog circuits, DS-1, CAS, SS7, or PRI SIP Circuits from OSPs
Egress Network: Redundant layer 3 IP network
Point of Demarcation of Company Service ●

	NGA 911 Provided	OSP Provided
	Solid lines	Dashed lines

Data Collection Tools
The tools used are Amazon S3, Lambda, Python, Redshift and Laravel: for pre-built reports and user interfaces

Database Backups

Backups are in the Cloud, where NGA 911 cost-effectively archives them with mechanisms designed to deliver 99.99999999999% durability.

Disaster Recovery

The NGA 911 cloud supports a disaster recovery (DR) architecture from "pilot light" environments that may be suitable for small PSAPs workload data center failures to "hot standby" environments that enable rapid failover at scale.
With access to data centers all over the world, NGA 911 provides a set of cloud-based disaster recovery services that enable rapid recovery of our customers' infrastructure and data.