

NG-911/CSI Cutover Strategy

December 14, 2012

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1.0 Overview

The Cutover Strategy document is being updated ~~at the request of the Illinois Commerce Commission (ICC) Staff~~ to reflect the changes in the 9-1-1 SSP. The Counties of Southern Illinois (CSI) ETSBs voted that NG-911, Inc, will become their 9-1-1 SSP. NG-911, Inc. was certified to be a 9-1-1 SSP in Illinois in August 2012.

The following Cutover Strategy has been developed to test and cutover the NG 9-1-1 network in the Counties of Southern Illinois, (CSI), as outlined in the Design Plan, Assure911.net-DG-CSI/NG911-001, Version 2, updated December 2012. The Cutover Plan details the steps necessary to move traffic from the existing 9-1-1 architecture to CSI's IP-Based Next Generation 9-1-1 communication system in the 15-county southern Illinois area.

It is CSI's intent to migrate live 9-1-1 traffic to the planned engineered, provisioned, tested, and cutover NG9-1-1 network during the approved Pilot Project. This is a clarification requested by the ICC Staff.

The 9-1-1 SSP and the CSI ETSBs recognize that for the Pilot Project, some access 9-1-1 traffic may route via the Selective Routers to get the Murphysboro and Harrisburg Data Centers for 9-1-1 call completion to the Public Safety Answering Points (PSAPs.) The Selective Routers are essential to the Transition Strategy from E9-1-1 to NG 9-1-1. The ultimate goal is to remove Selective Routers from the Network Architecture. The Selective Routers are a Single Point of Failure in the CSI footprint. The Carriers' Selective Routers are not capable of passing 9-1-1 calls from any device anywhere to any 9-1-1 answering point. This means the existing Selective Routers add facilities and trunks to the new Murphysboro and Harrisburg Data Centers while retaining their facilities and trunking to the existing PSAPs.

- All Access Carriers that serve the CSI area will migrate their 9-1-1 traffic from their originating offices, changing routing to CSI's pretested ESInet platforms in the Murphysboro and Harrisburg Data Centers.
- The CSI ESInet components in the two (2) Data Centers, at Murphysboro and Harrisburg, will distribute calls to the appropriate twenty one (21) new i3 PSAP systems.
- CSI will be migrating from twenty-one (21) PSAPs' aging analog 9-1-1 telephony PSAP systems to their new IP-based NG 9-1-1 Architecture.
- The forty-seven (47) i3 PSAP operator positions will be capable of Call Hold, Call Queue, Transfer and Dispatch to any of the various Organizations, primarily the Police, Fire and Ambulance Agencies.

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- The PSAP Operators will be able to transfer calls to other PSAPs within the ESInet footprint and neighboring Legacy PSAPs across the CSI ESInet borders.

- Attachment 1.1 - Access Carriers w/Data by Carrier
- Attachment 1.2 - Carrier Legacy Selective Routers (SR)
- Attachment 1.3 - CSI Data Centers
- Attachment 1.4 - PSAPs Primary and Back Up
- Attachment 1.5 - PSAP Operator Positions by PSAP
- Attachment 1.6 - Dispatch Frontline organizations by PSAP (Formerly ESNs)

The Attachments are being modified and/or completed after Data Exchange and Agreement for the Cutover Plan is reached with each participating Access Carrier. This document is to be referenced as a Cutover Strategy. The final details will be incorporated into a detailed Cutover Plan. Meetings with Carriers resumed at the direction of the ICC Staff in their October 31, 2012 meeting. The meetings are facilitated by NG-911, Inc., the 9-1-1 SSP designated by the CSI ETSBs. The meetings are focused on completing the planning, engineering, testing and cutover strategy for each Access and Selective Router and Facilities Carrier to enable a cutover of live traffic.

Section 2.0 provides Cutover Plan Strategy and the Cutover Plans with a series of steps that are designed to validate that the NG 9-1-1 system is working properly and Cutover Plans are comprehensive.

A basic assumption is that all of the preliminary unit and end to end call through testing has been completed and signed off prior to the day and time of the actual Cutovers. Refer to the (future) Cutover Plan by Carrier in Attachment 2.0. Other Attachments are included for future reference at the end of this document.

Section 3.0 includes the results of the Access Carriers meetings. The 9-1-1 SSP, the Access Carriers and CSI ETSB PSAPs provide the basic information for the Cutover Plans. Specific time of day and day of week conversions will be made within maintenance windows agreeable by the 9-1-1 SSP, CSI ETSBs and the Access and Facilities Carriers.

Section 4.0 describes the anticipated results that will be documented during the cutover and made available as required.

Section 5.0 is a Summary.

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1.1 Cutover Timing and Participation

The time(s) of Cutover will be negotiated between the 9-1-1 SSP, CSI, NG-911, Inc., the vendors and each Access Carrier. Considerations: Usage and User Demand History for the Busy Season, Busy Day and Busy Hours for the 9-1-1 network as agreed upon between the Carriers and the PSAPs involved in each Phase of the Cutover.

A formal Method of Procedure (MOP) document will be created and signed off by the 9-1-1 SSP, CSI and each Carrier prior to cutover. The 9-1-1 SSP and CSI will accept the format from the Access Carrier for the MOP or work on a mutually acceptable MOP outline prior to the date. A signed MOP will also be provided in advance to all of the participating organizations for review and to the vendors involved during the Cutover.

For example, if an Access Carrier is using SS7 signaling, CSI's SS7 Service Provider will see the advanced MOP and sign off as to their concurrence with the plan and the Cutover date. The SS7 service provider will be a part of the Cutover.

Cutover Planning meetings will be managed by the Project Managers from the 9-1-1 SSP and CSI, and the Access Carrier, and the PSAP Managers plus any other involved Carrier or required vendor. Typically, technical project management is required. This is not an administrative process.

Cutover Teams will be comprised of:

1. CSI: Patrick Lustig and Ken Smith, Steve Dixon, the appropriate CSI PSAP Manager(s) for specific Cutover, Melinda Woker, Database Manager, to make any changes required in real time, any other parties CSI chooses to have on hand at Murphysboro and Harrisburg. The PSAP designated as the primary PSAPs and on-net alternate PSAPs need to be staffed with person(s) who will accept and validate that test calls came through the ESInet and were acceptable. The persons performing this work will be in addition to the person(s) handling the regular 9-1-1 calls that may come in during the Cutover event. One person will be designated to take the plan through the steps required on the call and document each step as to completed or aborted with notations and exact timing.
2. The 9-1-1 SSP, NG-911, Inc.: Travis Stender and other technicians as may be named. One person at each Data Center will be designated who can reach the vendors in the CSI NG 9-1-1 architecture should help be needed. The 9-1-1 SSP and Systems Integrator, NG-911, Inc. will

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determine if a representative from each the NG 9-1-1 vendors with Functional Element (FE) equipment must be on the Cutover Conference calls and/or onsite during the actual cutover and/or onsite.

3. Access Carrier: Cutover Leader, Cutover NOC representative, Technician performing Cutover Tasks at the Host/Remote and/or in a Center capable of handling the work remotely. If physical changes need to be made at a Host or Remote Wire Center, or facilities tested on site, trunks made busy, translations changed, someone from the Access Carrier and/or Facilities Carrier organization capable of each step of the Cutover Plan needs to be available and on duty for the precise time of the cutover
4. Selective Router Carrier: Cutover Support, NOC representative, Technician performing Cutover Tasks in each Selective Router.
5. Intrado and/or TCS, Sprint or other aggregator will facilitate testing and cutover activities where they provide aggregating routing and other services for selective Wireless and VoIP Carriers and they will be active during the actual cutover.

2.0 Cutover Strategy and Plans

The following section provides the Cutover Strategy and Plans for the CSI NG 9-1-1 Network.

2.1 Cutover Plan Strategy

The overall strategy for cutover is to first validate that the existing network is functioning properly, then validate that the translations and trunk status for the new routes are ready and proper. Using the access carrier's test call capability, perform test calls on the new routes, and verify proper handling. The next step is to cut live traffic, and perform additional tests to validate the new routes carry live traffic to the proper destination. Finally, create the conditions and circumstances to force alternate routing strategies, and using test calls, validate the proper response of the system end to end.

Cutover Planning and Execution will be organized and testing performed in the following sequence*:

Carrier ->
 Selective Router ->
 Originating Office ->
 Rate Center

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* Note: In the case of Wireless and VoIP Carriers, the Cutover Strategy may follow a logical structure as outlined in communications with Intrado, and/or other 3rd party Peering Provider. In those cases, not all Rate Centers will have to make test calls. Intrado can direct trunking and translation changes from their location. Conversation is underway to develop the details of their Plans.

The following guidelines, typical of any cutover in the telecommunications industry will apply to the CSI cutover.

A 9-1-1 SSP Conference Bridge will be up and operational prior to cutover activity with all relevant parties being online together. The persons running the bridge will have access to the direct dial numbers for each on duty person with name and numbers for the time of the cutover. In a typical NOC-like operation, Tier 2 Technical Support persons direct the work activity and vendors are aware of the activities and on standby for any assistance as required.

Records are maintained in real time and steps continue as needed until an originating office is declared done.

An originating office is not to be left in a partial completion state. It is checked off and completed or set aside for the next alternate test date. The re-testing starts from the first step, not at the point of failure. The PSAPs can be left in a partially cutover mode and may have to maintain Dual Status until the Cutovers are completed. Dual Status means accepting calls from the E9-1-1 network and the NG 9-1-1 network until the PSAP is completely transitioned.

Rollback and/or Corrections will take place to Protect Live 9-1-1 Service.

Errors and fallouts at one office/point/location can cause the office/point/location to be skipped. If so, the Cutover Team moves to the next office/point/location until the basic plan is completed for the scheduled date. Errors and fallout problems will be worked on by the designated team members and the next attempt for resolution ideally will be after all the scheduled cutover activity has completed. If technicians need to be retained onsite in any location, it will be because an agreement has been made ahead of the Cutover with the 9-1-1 SSP, CSI and the Carrier to do so.

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2.2 Cutover Plans

Detailed plans will be developed in conjunction with the various Access Carriers, as call set up signaling options, trunk configurations, and physical facility layouts are solidified. These plans assume all NG 9-1-1 testing is completed well ahead of the Cutover dates according to steps in the Test Plan document, Assure911-NG911CSI-STP-001, Issue 2. These plans will be in the hands of everyone participating in the Cutover.

2.3 Cutover Steps

The following represents the basic series of steps that are designed to validate that the NG 9-1-1 system is working properly. These steps depend on the Cutover Plans described in section 2.2 above. The steps are checked off as each step completes by someone designated to do so at the NOC-like 9-1-1 SSP location for CSI.

Step 1: *Verify Existing Service – Test Call*

Prior to Cutover, the access carrier will place test calls to validate that the existing network from each end office by NPA-NXX, or subset for split Rate Center offices, to each designated primary and secondary PSAP can connect 9-1-1 properly. The team at the target PSAP will validate that the correct Dispatch Organization appeared on the PSAP Operators terminals.

Step 2: *Verify New Routes – Test Call*

Still prior to cutover, the access carrier will place test calls to validate that additional test calls from the same locations, using routes to the new CSI i3 NG9-1-1 Architecture ESInet connect properly through to the new i3 PSAPs. As in step 1, the target PSAP will validate that the same Dispatch Organizations appear on the new PSAP Operator terminals. The NG9-1-1 Database and network are tested simultaneously.

Step 3: *Verify Existing Service – Live*

The Access Carrier will place live 9-1-1 calls from each Central Office Host and/or Remote, from each Rate Center. The PSAP operators will answer and document test calls before the Cutover, noting the destination Dispatch entities are displayed on the Legacy PSAP screens.

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Step 4: *Cut and Verify*

The Access Carriers will redirect their 9-1-1 translations to the two (2) new ESInet trunk groups, and the same Carrier will repeat the live call testing as stated in Step 3. Call traps and traces will be used to verify that the calls go to the first route Murphysboro and Harrisburg Data Centers or in reverse according to the predesigned routing plans.

Step 5: *Force to Alternate Trunk Route*

The Access Carriers will “make busy” their first route NG 9-1-1 trunk groups and the live 9-1-1 calls from Step 4 will be placed again, tracing the calls through the second pre-designated Data Center to completion according to the pre-designated routing plans.

Step 6: *Force to No Route Available*

The Access Carriers will block all 9-1-1 trunk groups from each Central office and the live 9-1-1 calls from Step 4 which should receive a 120 IPM, all trunks busy. Trunks will be quickly restored to Service after a Host and/or Remote or Switch completes the Step 6 testing.

Step 7: *Queuing Test*

Access Carriers will place additional 9-1-1 calls with a minimum of a single call being placed in queue at the PSAP while another call is being handled.

Step 8: *Transfer In*

Access Carriers will place an additional call where the PSAP Operator transfers the call on net (on the CSI ESInet) to an adjacent CSI ESInet PSAP and verify the pre-designated PSAP receives the call.

Step 9: *Transfer Out*

Access Carriers will place an additional call where the PSAP Operator transfers the call on net (on the CSI ESInet) to an adjacent non CSI Legacy PSAP and verify the pre-designated PSAP receives the call.

Step10: *Force No PSAP Available*

At least one series of tests will be placed by each Access Carrier to determine if calls blocked inside the CSI ESInet go to 60 IPM, Busy Signal

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according to standards. In the fully operational CSI ESInet configuration that condition should seldom if ever exist. The test will involve making “busy” the CSI ESInet trunk groups, both Primary and Alternate PSAPs for the test to work. Once this test is made the ESInet to PSAP trunk groups will be restored.

Step 10: *Verify Logs*

The CSI ESInet Cutover team will check to see if calls were logged properly for each of the tests.

Step 11: *Capture and Document Results*

Testing software (e.g., Wireshark) will be utilized to execute Traps and Traces and will be stored in a file folder for each Carrier. Call failure messages will be obtained from the tests and retained in a file by Carrier and by Central Office. This will include the anticipated failures and any failure found during the Cutover Process. All notes for blocked and/or failed calls will be logged in the 9-1-1 SSP and CSI Trouble Tracking System for Reporting. The data will be used as the benchmark for performance at Cutover. Testing will include Call set up times and call response times from start to finish on the Legacy network and on the CSI ESInet.

3.0 Carrier Meeting Final Cutover Data

Data needed to finalize the detailed cutover plans will be exchanged with the access carriers and any involved underlying network providers and/or third party providers as additional meetings are scheduled and decisions about the migration to the CSI ESInet are finalized.

4.0 Cutover Results Documentation

The CSI team will capture and analyze the results as each cutover is performed.

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Attachments – to be developed as part of each Cutover Plan - this work is in progress after the October 31, 2012 ICC Staff meeting.

Note: Some Carriers are cooperatively attending meetings with decision makers and engineers. Others are communicating in email but participation by engineers or decision makers are not in evidence. The 9-1-1 SSP is initiating the contacts.

~~The ICC Staff concerns were heard and the~~ The 9-1-1 SSP has been identified and is lead efforts to get the access facilities and routes defined and priced. The Selective Routers are an essential part of the strategy for conversion.

Attachment 1.1 - Access Carriers w/Data by Carrier

Attachment 1.2 - Carrier Legacy Selective Routers (SR)

Attachment 1.3 - CSI Data Centers

Attachment 1.4 - PSAPs Primary and Back Up

Attachment 1.5 - PSAP Operator Positions by PSAP

Attachment 1.6 - Dispatch Frontline organizations by PSAP (Formerly ESNs)

Attachment 2.0 – Cutover Plan by Carrier including Tools

Attachment 3.0 – Roster of Cutover Participants by Carrier including Leadership

Attachment 4.0 – Bridge to be used for Cutover – including Access Instructions

Attachment 5.0 – Measurements and Results per Cutover - Format

Attachment 6.0 – Open Items per Cutover and Lessons Learned