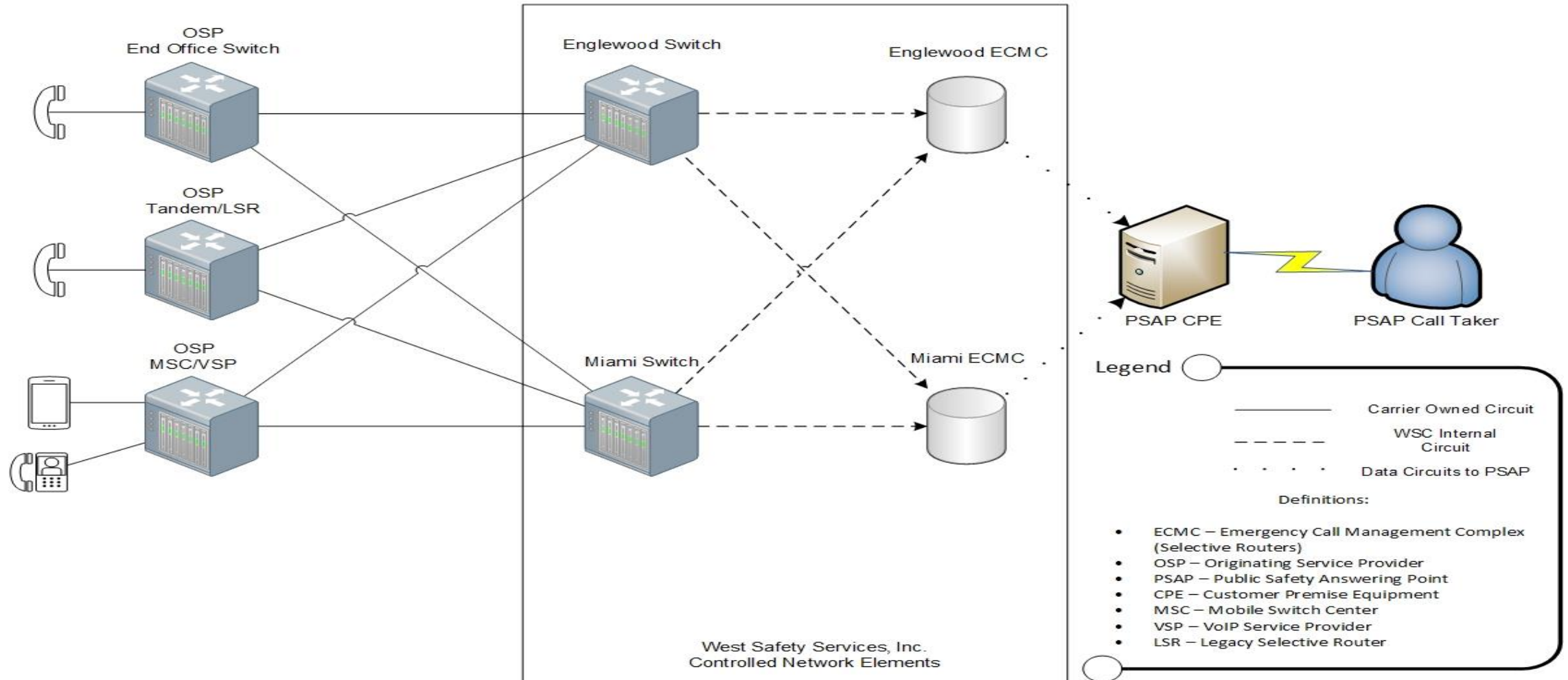# Cause of 7/12/17 Outage

- Occurred during maintenance event that was part of bigger project to upgrade West's emergency voice switches at Englewood and Miami from REDACTED switches to REDACTED Servers REDACTED

- Switch upgrade project was conducted over the course of a year from late 2016 to late 2017; traffic selectively migrated in segments according to detailed project plan

- As part of the migration of a portion of the WA traffic on 7/12/17, West exported the database with all of the trunk group information from our old switch to our new switch

- During the insertion phase of the database transfer, a machine error resulted in Ingress Trunk Group (ITG) flags not uploading correctly to the database for the new switch for a small portion of the migrating trunk groups

- The West Emergency Call Management Center (ECMC) (Selective Router) uses the ITG field to determine where and who a call originated from and what default PSAP is associated with the attendant trunk group. Without the ITG field, the ECMC rejects the call and returns a cause code 34 to the Originating Service Provider (OSP) indicating that the trunk is unavailable and the call should be rerouted

Washington 9-1-1 Network Diagram

West Safety Services Network Diagram

OSP
End Office Switch

Englewood Switch

Englewood ECMC

OSP
Tandem/LSR

PSAP CPE

PSAP Call Taker

OSP
MSC/VSP

Miami Switch

Miami ECMC

Legend

Carrier Owned Circuit

WSC Internal
Circuit

Data Circuits to PSAP

Definitions:

- ECMC – Emergency Call Management Complex (Selective Routers)
- OSP – Originating Service Provider
- PSAP – Public Safety Answering Point
- CPE – Customer Premise Equipment
- MSC – Mobile Switch Center
- VSP – VoIP Service Provider
- LSR – Legacy Selective Router

West Safety Services, Inc.
Controlled Network Elements

REDACTED

Intrado

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Mitigating Factors

- Project aim was to provide "modern, adequate, sufficient and efficient" appliances/service by keeping switching "facilities . . . in good condition and repair" via switch upgrade

- All calls reached the ECMC/Selective Router during the outage

- Pre-validation steps showed no errors in database export and transfer (included audit of ITG tags)

- Call failure alarms worked as designed and identified lack of ITG tags

- Prompt response by West – Internal fault management process triggered; NOC-to-NOC communication between West and CenturyLink; busied migrated trunks to force OSPs to alternate final route and manually reviewed and corrected the data extract

- Returned appropriate cause code 34 to OSPs for forward routing to redundant Miami switch

- Followed detailed project plan designed to limit potential for disruption by migrating voice traffic in small segments over short periods of time during the middle of the night

- Partial outage – small number of WA trunks affected and Englewood switch not hard down

- Only known disruption during entire switch upgrade project over course of a year

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Corrective Action

- Updated Method Of Procedure (MOP) by adding manual, post-data load validation step

- Pre-notification of maintenance events to CenturyLink regardless of severity level or disruption potential

- Upgraded physical resources of provisioning server and restricted user access to reduce potential for unforeseen resource absorption

Description of Traffic Migration Project: REDACTED

REDACTED

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Normal 9-1-1 Call Flow REDACTED

REDACTED

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Normal 9-1-1 Call Flow REDACTED

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Designated Information is CONFIDENTIAL Per Protective Order in Docket No. UT_190209

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Data Entry Flow During Switch Upgrade Project

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