

Robustness of PSAP Radio System

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Purpose of this presentation:

To demonstrate IV&V activities applied to ECTP2 Radio Console (RC) and Emergency Control Station (ECS) Projects:

- Stage 1: Understanding of the Project Scope / Creation of Technical References;
- Stage 2: Preliminary dependability analysis / DDD and Requirements analysis against Technical References
- Stage 3: Bottlenecks identification / Failover and Redundancy analysis

ECTP2 Challenges:

Complicated large scale project:

- Critical Public Safety Project with high availability requirements;
- Coexistence of New and Legacy equipment;
- Sub-Projects integration;
- IP and TDM technologies;
- Data Centers and Virtualization;
- Different types of equipment (PC-consoles, Servers, IP-networks, IP-gateways, Microwave, Radio, Channel banks, Voting comparators, Fiber Optic, wirelines, etc.)

Understanding of the Project Scope and Creation of Technical References

Studying initial ECTP2 project documents and getting familiar with the project scope

Creation of TR based on documents provided by Gartner, on manufacturers' documentation and brochures (Motorola, Harris, CTI Products, NICE, etc.), and on information at Internet

Deliverables analysed against TR:

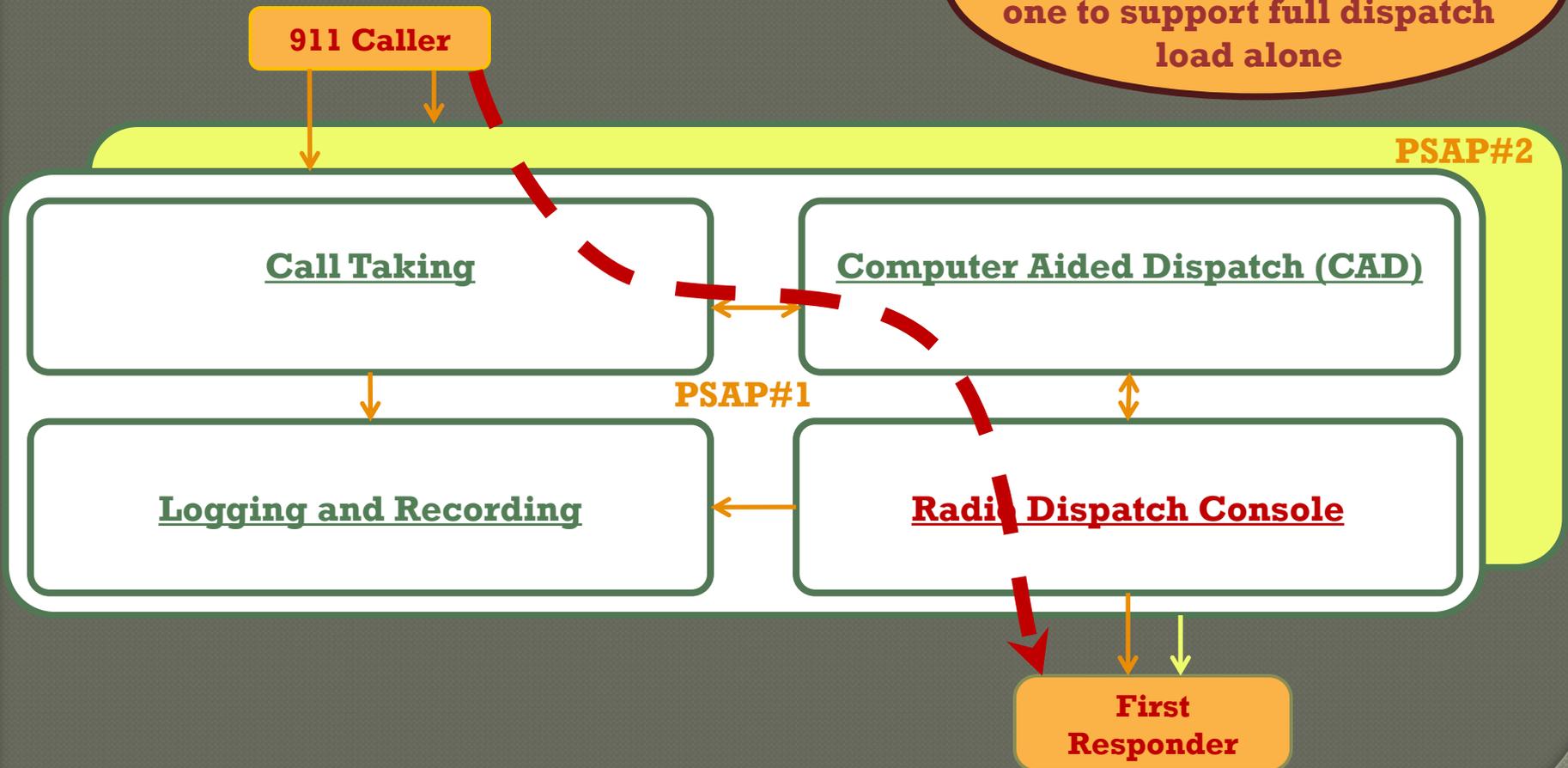
- **Scope Of Work requirements**
- **Working Requirements**
- **Detailed Design Document**
 - **Drawings**
 - **Bill of Materials**
 - **Use Cases**
 - **Test Cases**

Radio Dispatch Console Role

ECTP technologies link Callers to First Responders

Radio dispatch is an effectual response on the emergency call

“Multi-PSAP’s” parallel operation. Ability for either one to support full dispatch load alone



Addressing Dispatcher's Needs:

While analyzing ECTP2, IV&V team paid specific attention to RC/ECS design focusing on system reliability, equipment redundancy, and failover procedures

Dispatch Objectives:

- ⦿ Right forces
- ⦿ In Right Place
- ⦿ In Right Time

Radio Console Duties:

- ⦿ Powerful Multifunction Tool
- ⦿ Reduced Call Setup Time
- ⦿ High Quality Audio
- ⦿ **High Availability**

Typical PSAP Radio Project Scope

PSAP#1 Radio Console

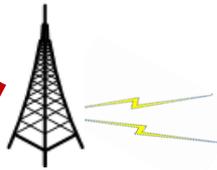


Dispatcher Console



Deskset

PSAP#1 ECS



Emergency
Control Stations

PSAP#2 Radio Console

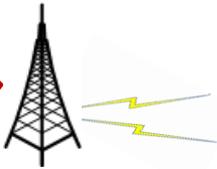


Dispatcher Console

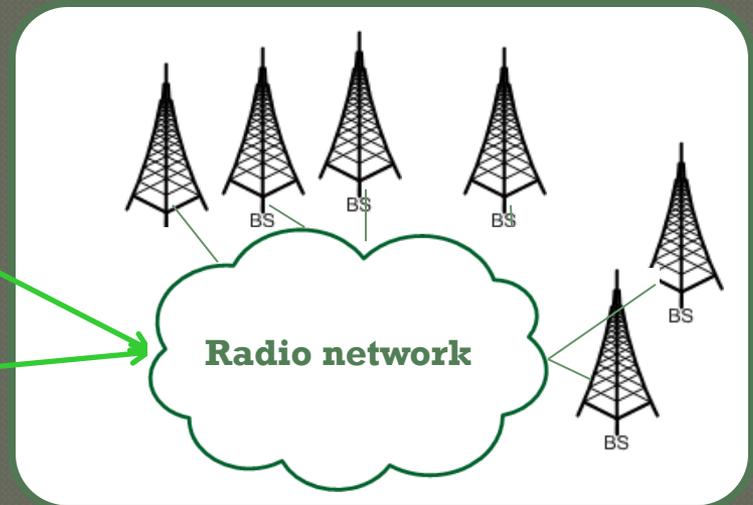


Deskset

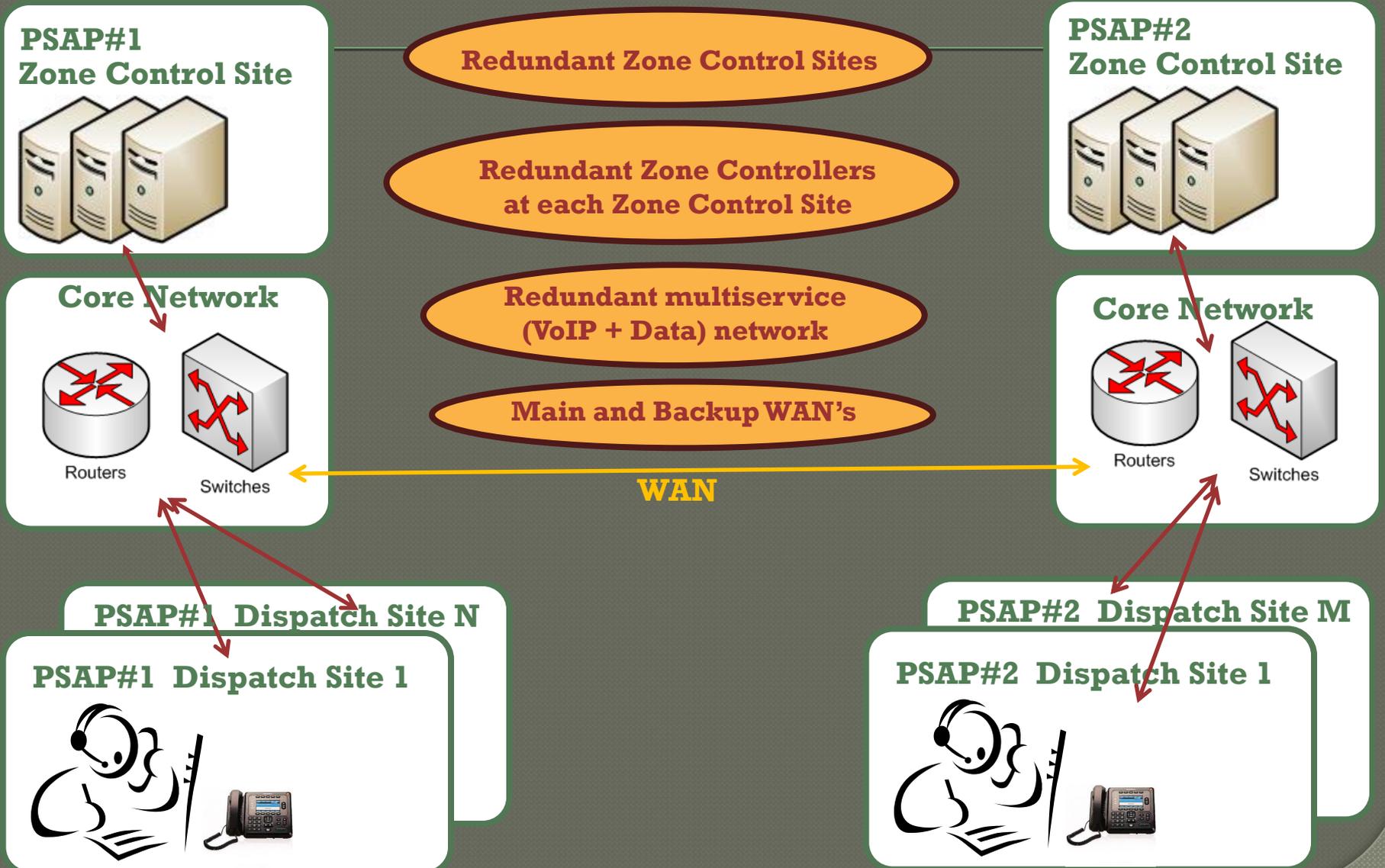
PSAP#2 ECS



Emergency
Control Stations

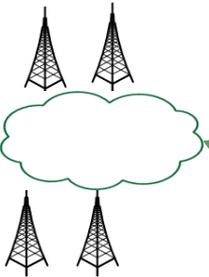


Radio Console Redundant Architecture

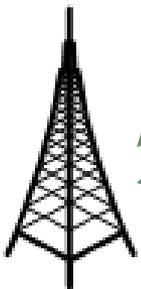


Radio Console Redundancy

Radio Network

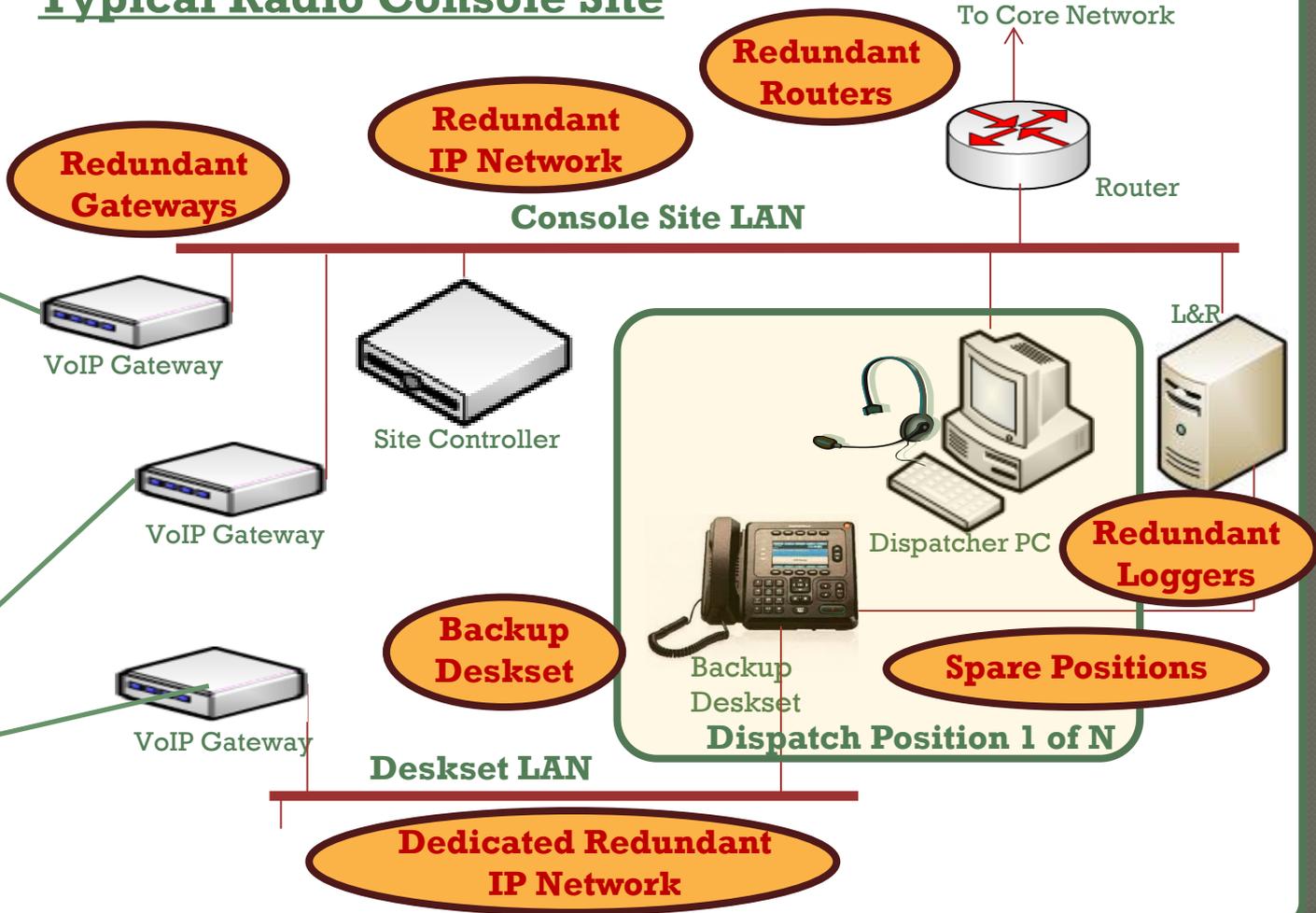


ECS

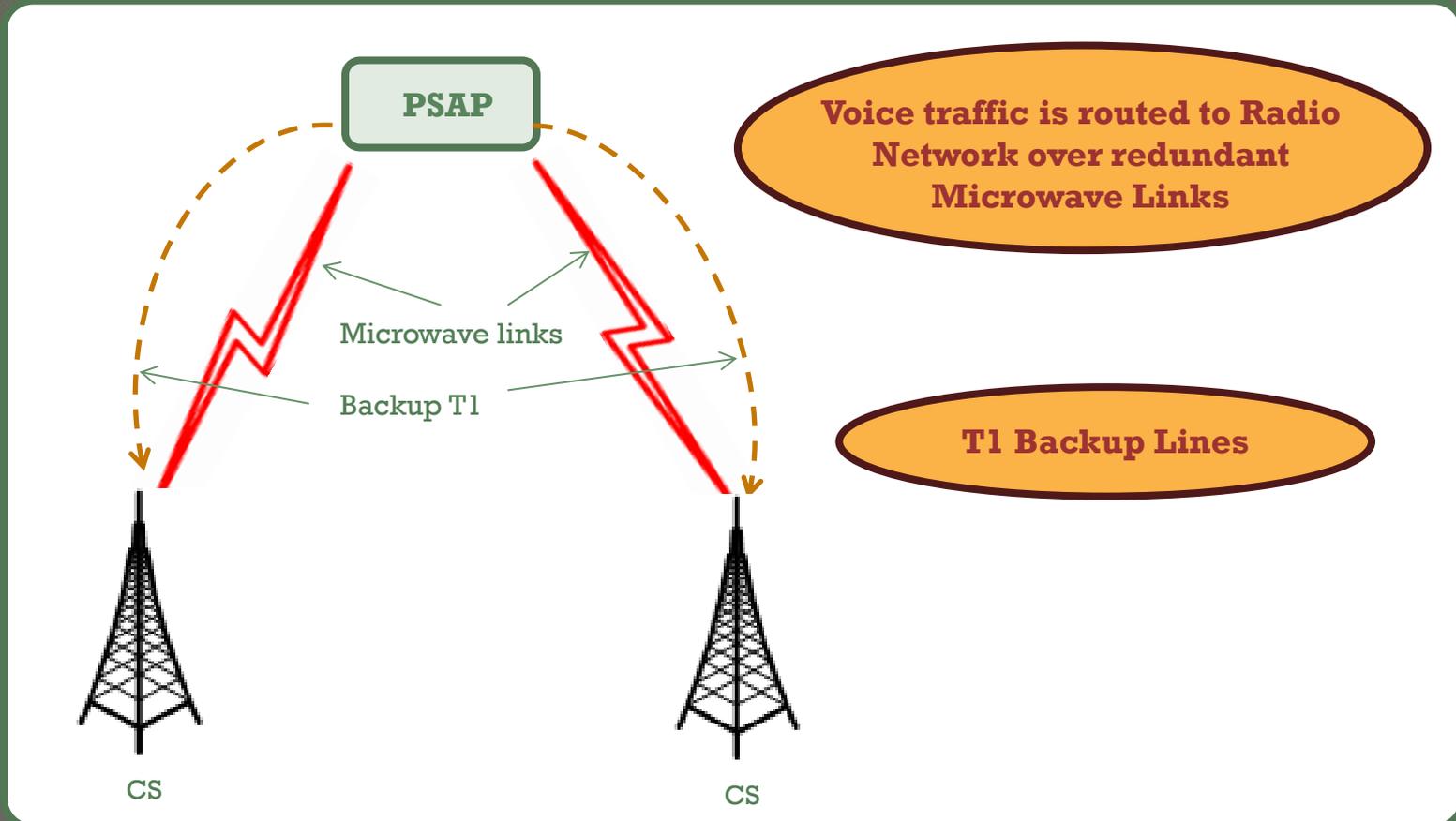


ECS

Typical Radio Console Site



Typical Microwave Connectivity



IV&V Failover Evaluation

Inter-PSAP Failover

Microwave Links Failover

Backup T1 Failover

Radio Network/ECS Failover

Zone Controllers Failover

**Zone Controller/Site Controller
Failover**

**Radio Console/ Deskset
Failover**

OCEC, System Integrator, and vendors do their job creating a robust Radio Console Network.

In order to contribute into this project and to reach our goal – “Mission Success” – NASA IV&V provides additional assurance with independent analysis.