



CITY OF OAKLAND

CALIFORNIA

Comparison Report December 17, 2013



RCC Consultants, Inc.

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Introductions

RCC Consultants, Inc.

Tom Gray, Vice President & General
Manager, Western Region



Focus of the Report

- Perform a Side by Side Comparison of Coverage provided by Oakland and EBRCS P25 Radio Systems
- Perform a Radio Feature Portability Test, to verify how Oakland radios will work on the EBRCS system
- Develop a Business Case analysis of pros, cons, and costs of staying or moving
- Look at Microwave System issues



Coverage Testing

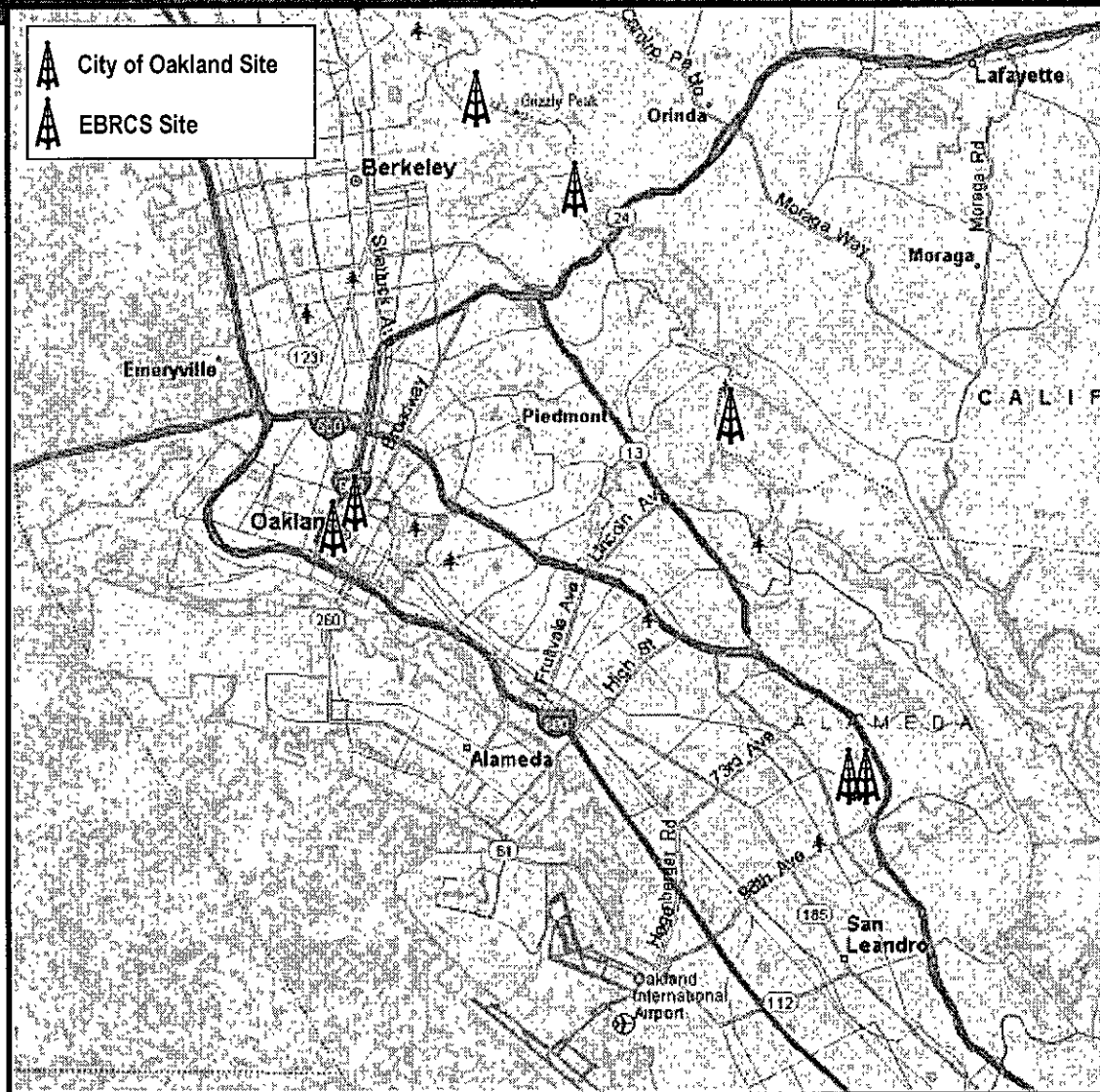


Coverage Testing

- Measured signal level, bit error rate, DAQ
- Tabulated results statistically
- Graphically displayed results in MapPoint



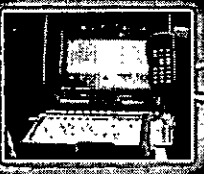
KNOWLEDGE & EXPERIENCE
GUIDING THE WAY





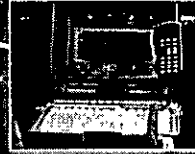
Coverage Testing

- Signal Strength Results
- Measurement of signal available
- Over 34,000 samples taken throughout Oakland service area
- Results were very similar



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Usage Type	Target Signal Level	Percentage of Area Covered by OAK	Percentage of Area Covered by EBRCS
Mobile at Trunk Level	-108 dBm	99.59%	99.64%
Portable at Head Level	-105 dBm	99.49%	99.14%
Portable on Belt	-95 dBm	97.77%	97.20%
Portable on Belt in 10dB Building	-85 dBm	90.91%	91.00%
Portable on Belt in 20dB Building	-75 dBm	67.58%	69.08%



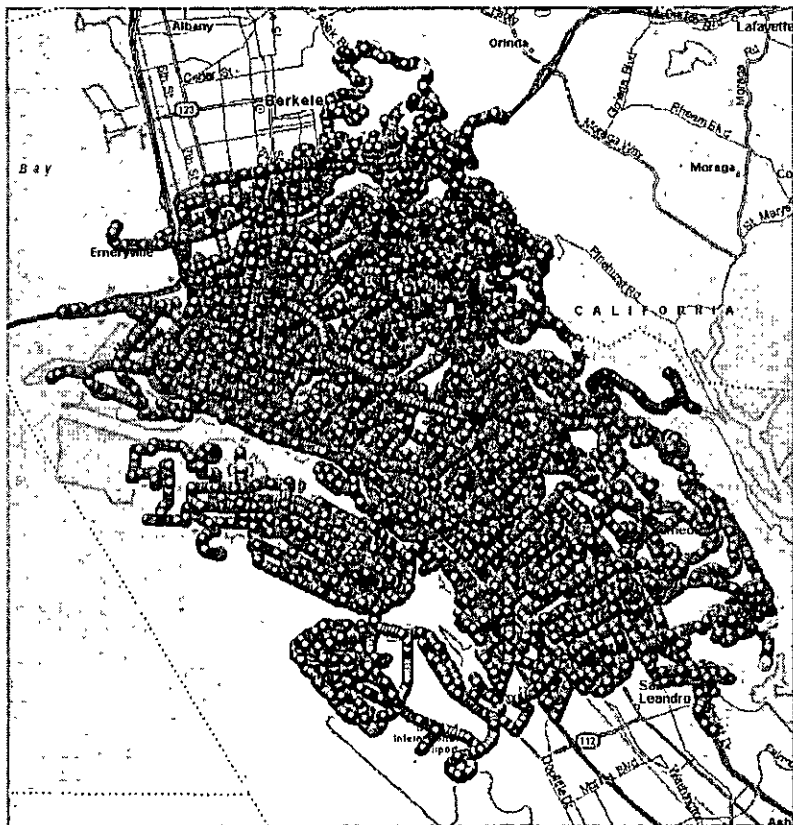
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BER	Percentage of Area Covered by OAK	Percentage of Area Covered by EBRCS
0.0 to 1.00%	97.38%	95.40%
1.01 to 2.00%	1.19%	2.01%
2.01 to 2.60%	0.26%	0.52%
2.61 to 5.00%	0.40%	0.72%
5.01% to 8.00%	0.22%	0.65%
8.01% or greater	0.56%	0.70%

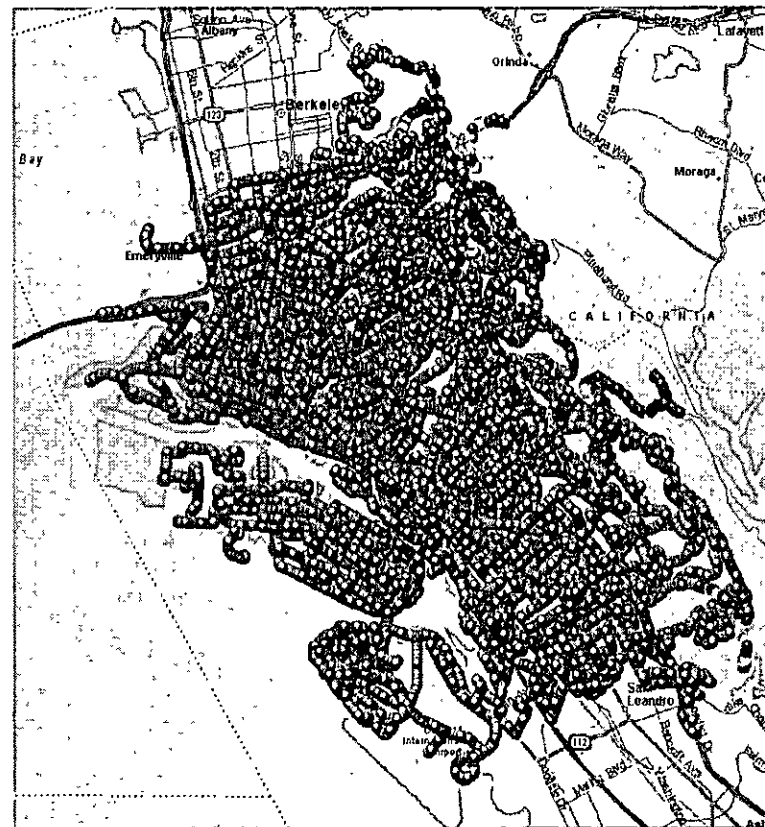


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Signal Strength



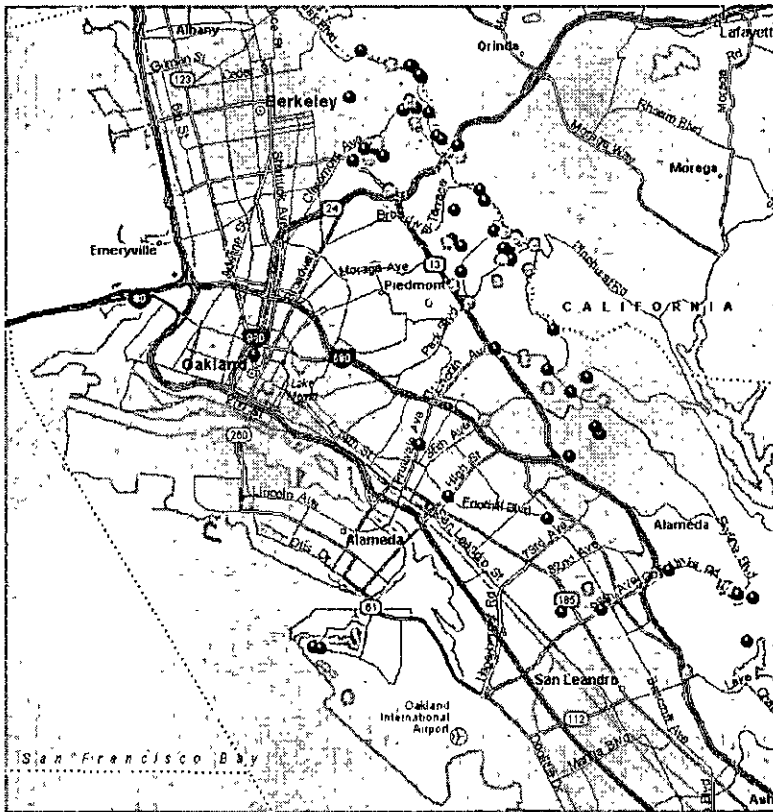
Oakland P25 System



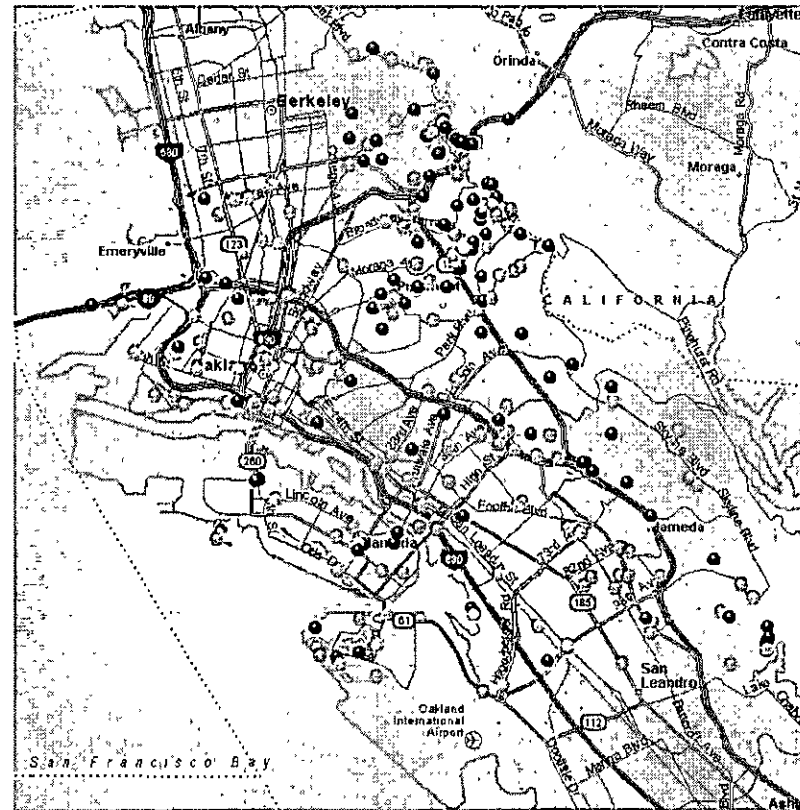
EBRCS P25 System



BER Testing



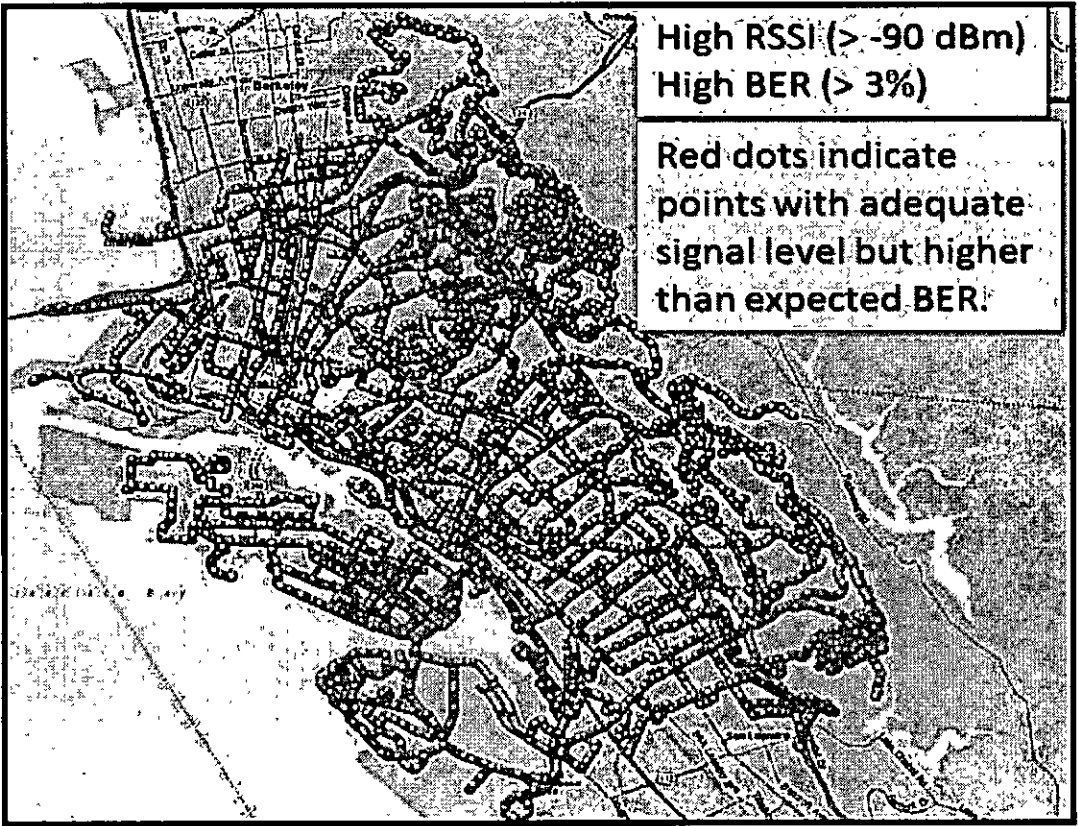
Oakland P25 System



EBRCS P25 System



Original City BER 2012 Report



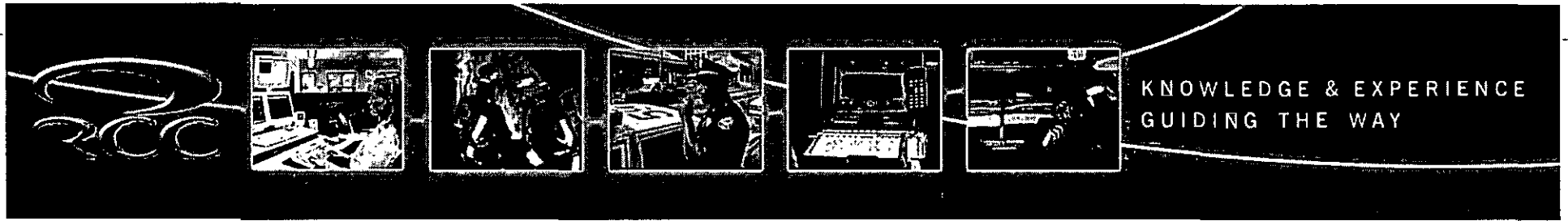


Coverage Testing

- High BER in High Signal area
- We observed slightly higher BER on EBRCS
- Oakland has been aggressively pursuing reports of interference, and working with a specialist and an FCC attorney to respond to interference from commercial cellular carriers
- Interference mitigation **MUST** be aggressively pursued on large public safety systems.



Radio Feature Portability

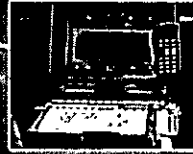


Radio Feature Portability Testing

- Performed tests found, the majority of radio features worked on both systems.
 - Motorola consoles do not clear emergency alerts from declaring Harris radios
 - Could not get Oakland radios to roam on EBRCS system
 - Were unable to test failure modes on a working system (without impacting active users)



Business Case Analysis



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GUIDING THE WAY

Business Case Analysis

Known Costs

- Moving to EBRCS:
 - One-time Joining Fee: \$540,000
 - (all users: 1500 OPD, 700 OFD, 500 PWA)
 - Ongoing Usage Fees: \$1,004,400 per year
- Staying on Oakland:
 - One-Time Improvements: \$1,375,000
 - (all users: 1500 OPD, 700 OFD, 500 PWA)
 - Additional Ongoing Backbone Support Costs: \$235,000 per year



Business Case Analysis

Known Costs

Either Way:

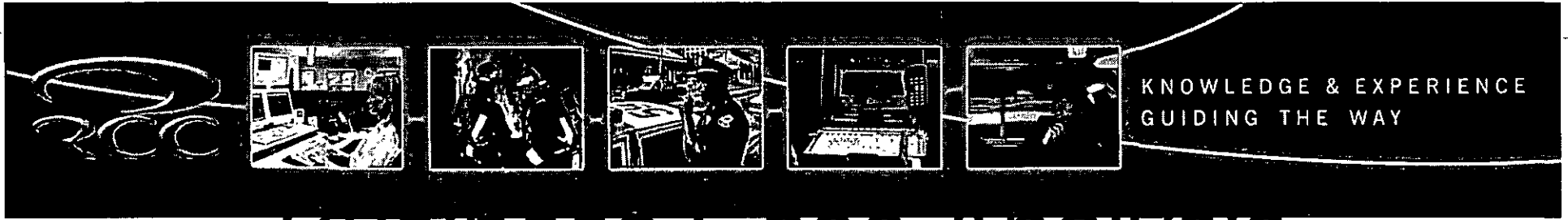
- Radio Shop capabilities must be upgraded or outsourced
 - \$ TBD (believe the budget already has sufficient funding)
- Public Safety User Radios must be Replaced:
 - \$15-20 million



Business Case Analysis

Most significant issues:

- Ongoing support and maintenance
 - Number one reason mentioned by those who favor moving to EBRCS
 - EBRCS has a known budget, a maintenance plan, and active oversight of the radio system.
 - Both internal and external interviewees cited this as the primary EBRCS advantage
 - (more important than coverage, more important than interoperability)



Business Case Analysis

Most significant issue:

- Ongoing support and maintenance
 - The City has indicated that it has a 3 step plan to shore up it own radio system, and appears to be making excellent progress along those lines.
 - However, that system is currently being maintained by Harris and DWC personnel, absent a formal maintenance agreement
 - That Contractor's role must be formalized, or must be taken over by the Radio Shop.



Business Case Analysis

Most significant issue:

- Ongoing support and maintenance
 - Radio Shop staff still are not adequately trained or equipped to maintain the Oakland system independently
 - Must add staff
 - Must get factory training for City staff



Business Case Analysis

Most significant issue:

- Ongoing support and maintenance
 - That responsibility does NOT simply go away if the City chooses to move to EBRCS.
 - EBRCS will maintain the radio *backbone* and the radio consoles, but NOT the end user radios



Business Case Analysis

Most significant issue:

- City has 3 options for subscriber maintenance (*even if it decides to move to EBRCs!*):
 - Upgrade its own internal staff and capabilities
 - Formalize a maintenance relationship with a contractor for supplemental support
 - Outsource its radio maintenance duties to a third party (A contractor or another government entity)



Business Case Analysis

Most significant issue:

- Ongoing maintenance and operation is the key issue from RCC's perspective.
- IF Oakland stays on its own system, RCC recommends forming a Radio System Management Board, with reps appointed by Police Chief, Fire Chief, CIO, and City Administrator



Business Case Analysis

Most significant issue:

- Sustainability is the key
- The City's ability to self-maintain (or monitor contractors) is a significant issues identified by the interviewees, and in RCC opinion

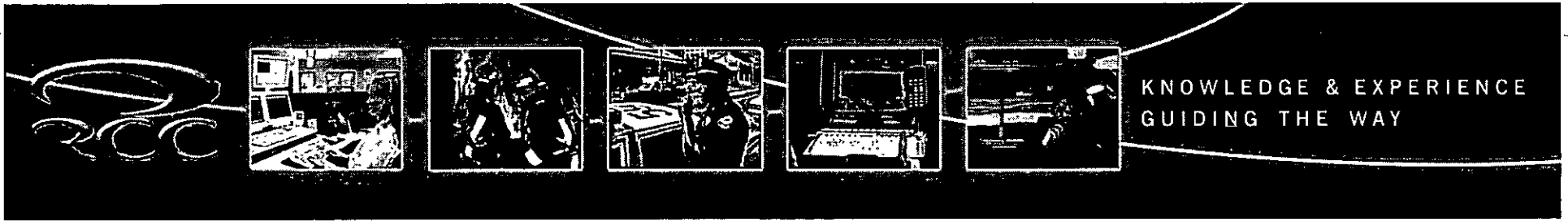


Microwave Study



Microwave Study

- Net result: RCC does not see any compelling need to merge the two networks
- The networks could remain independent, as each serves a different purpose for a different entity
- City microwave could be used to provide path protection for the Seneca site



Q & A / Discussion



Thank You for Your Time