COG's Hospital Resiliency Project

Presented to the Energy Advisory Committee

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Hospital Resiliency Project Overview

- **UASI 2009 funds $1.7 million**

- **Objectives:**
  - ***Continue hospital critical functions for up to 96 hours during interruptions of utility water or power.***
  - ***Reduce risk of evacuations & speed up response and recovery.***

- **Tasks:**
  - ***Conduct a needs assessment and develop design plans & construction to ensure back-up water and/or power during emergencies, to the maximum extend feasible.***

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Hospital Resiliency Project Team

- Metropolitan Washington Council of Governments (COG)
- District of Columbia Hospital Association
- Northern Virginia Hospital Alliance
- Suburban Maryland Hospital Association
- HDR Engineering, Inc. contracted to conduct the needs assessments reports, oversee the design plans, and conduct research.

Project Approach

- **Phase I – Water and Power Assessment and Gap Analysis (completed)**
  - *HDR reviewed baseline materials.*
  - *Met with hospitals and conducted onsite assessments (17 hospitals in MD & DC). VA hospitals independent.*
    - Identified major resiliency capabilities in place
    - Identified major resiliency capabilities not in place
  - *Reported – Existing conditions, major vulnerabilities and proposed/recommended solutions and estimated costs.*
  - *Draft reports submitted in September 2011 to hospitals for comment.*
  - *Final reports-Comments addressed and serve as design guide.*

- **Phase II – Design**
  - *Part A – prioritize work and identify design consultant*
  - *Part B – develop designs for participating hospitals*

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Power Resiliency – Major Vulnerabilities

- **Some hospitals with no power backup on major equipment.**
  - *Chillers*
  - *Cooling towers*
  - *Water booster pumps*
- **Air handling units (AHUs) not on emergency generator power.**
- **Other critical loads (pharmacy, labs, central sterile) not on emergency generator power.**
- **Inadequate fuel storage for 96-hour power outage.**
- **Note: Aging generators and electrical equipment**

Power Resiliency – Cost Estimates

- **Cost Summary**
  - *Low - $38,000*
  - *High - $1,639,000*
  - *Average - $608,000*

Hospital	Draft Report Estimate
1	$492,000
2	$205,000
3	$350,000
4	$38,000
5	$319,000
6 - Alt 1	$829,000
6 - Alt 2	$309,000
7	$299,000
8	$1,639,000
9	$348,000
10	$254,000
11	$1,211,000
12 - Alt 1	$482,000
12 - Alt 2	$168,000
13	$386,000
14	$928,000
15	$1,337,000
Total All Hospitals	**$9,117,000**

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Water Resiliency –Major Vulnerabilities

- **In 2004, the EPA identified hospitals as critical water users**
  - o Prioritized notification of water system failure by providers
  - o Prioritized service response during outages
  - o Inclusion of healthcare facilities in coordinated emergency response planning
- **Hospital Emergency Managers in a 2005 UASI COG study stated that they *considered emergency water supply to be the most intractable of issues* to be addressed in their emergency operations plans.**
- **Greatest fraction of water demand is for mechanical systems including pumps, fire suppression, and–esp. heating and cooling in winter and summer. These seasons also have the greatest potential for natural disasters.**
- **HVAC demands can only be marginally reduced.**

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Water Resiliency – Cost Estimates

- **Cost Summary**
  - *Low - $16,000*
  - *High - $210,000*
  - *Average - $104,000*

Hospital	Draft Report Estimate
1	$16,000
2	$119,000
3	$42,000
4	$17,000
5	$147,000
6	$85,000
7	$149,000
8	$121,000
9	$74,000
10	$121,000
11	$210,000
12	$161,000
13	$38,000
14	$93,000
15	$128,000
16	$128,000
17	$120,000
Total All Hospitals	**$1,769,000**

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Decision to Address Water Resiliency First

- **Rationale for focus on water**
  - *Costs for backup power were significantly higher than those for backup water. This is consistent with other recent studies of critical infrastructure in the NCR.*
  - *Cover the greatest number of hospitals (do the most good with existing $$$).*
  - *Lack of existing water resiliency.*
  - *Ability to carry out work quickly.*

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Water Resiliency - Findings

- **General Recommendations**
  - *Hospitals to provide for 96 hours bottled water storage or delivery*
  - *Emergency water connections to hospital distribution system and/or mechanical water system*
  - *Provide portable bladder tanks to tie-in to emergency water connections*
  - *Hospitals to contract with potable tanker trucks for delivery during emergencies*

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Project next steps

- HDR, Inc. or hospital engineering firm will develop design plans to enhance hospitals' water resiliency.
- On the ground implementation/construction by hospitals, using project funds. To be completed April 2012.
- Work on regional coordination of tanker trucks and bottled water contractors.
- Seek additional funding to address hospitals' power resiliency.

Another Power Project

- **Separate from the hospital project, COG has been working with the U.S. Army 249th Prime Power BN to assess backup power needs at other critical infrastructure in the NCR:**
  - *Water and wastewater treatment*
  - *Emergency shelters*
  - *Other key facilities*
  - *Steve Bieber could share more information about these assessments at a future meeting.*

QUESTIONS?

For More Information

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- **Hospital project team members:**
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  - *Craig DeAtley, DC Hospital Association*
  - *Kathleen Timmons, Corporate Director of Adventist Health Care*