

Community Resilience through Grid Resilience

Developing a Flood Mitigation Program with a Utility

March 9, 2016

Primera

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Agenda

Mitigation Program Development

Flood Risk Assessment and Prioritization

Challenges & Best Practices

The Key to Success

Community Resilience through Grid Resilience | Developing a Flood Mitigation Program with a Utility

Electrical Grid 101

ASCE: The grid connects Americans with 5,800 major power plants and includes over 450,000 miles of high voltage transmission lines.



Grid Resilience & Storm Hardening

October 2011

 Energy Infrastructure Modernization Act (IL Legislature)

August 2013

- Economic Benefits Of Increasing Electric Grid Resilience To Weather Outages (Executive Office of The President)
- Severe Weather is the #1 Cause of Widespread Power Outages
- Annually Cost to US Economy for Weather-Related Outages: \$18 - \$33 billion

Today

 Illinois is on the Leading Edge of Smart Technology and Resilience

June 2011

• A Policy Framework for the 21st Century Grid (Executive Office of The President)

EIMA Begins, GRIP is added Storm Hardening -> Grid Resiliency



Vegetation Management

New Technology





Grid Resilience Evolves Flood Mitigation



Risk Assessment

Mitigation Action

Flood Mitigation Program



Plan Development Local, State and Federal permitting

- Identification
- Risk Assessment

Feasibility Studies

Alternatives Analysis

Mitigation

Hazard Assessment

GIS-Based Assessment Using Readily Available Data

Hazard = High, Moderate-to-High, Moderate and Low

- High = Floodway
- Moderate-to-High = 1% annual chance floodplain
- Moderate = 0.2% annual chance floodplain
- Low = Unshaded Zone X

Level of RiskTOTALHigh20Moderate to High36Moderate19Low730

Refined Hazard Analysis

- Unmapped waterways with flood risk associated
- Levee impacted areas

Risk Assessment



Risk = Hazard x Consequences

Flood Mitigation Program



• Feasibility Studies

Challenges

Resolutions

Assessment & Planning Challenges Educating a Utility's Management About Flood Risk - 100 Year Flood, Low Risk not No Risk, Risk vs. Hazard, etc.

Identifying Meaningful Consequences in Assessing Risk

Getting Various Sides of the Utility on the Same Page During Alternatives Analysis

Cost is Major Driver

Prepare Slide Decks and Executive Summaries of All Reports – Work Summary with Background and Education on Flood Hazards and Risks

Close Coordination with Utility – Engineering and More

Carefully Present All Sides of a Case for Each Alternative – Civil Eng, Electrical Eng, Testing, Operations

Use Construction Expertise in Costing and Comparisons

Flood Mitigation Program



Feasibility Studies





TSS 69 Flood Mitigation Design

TSS 69 Flood Mitigation Design

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습 HØ. -08 18-10 10'-0' PROPOSED "S" COMOLIT ENDER HALL SEE DIST. DESIGN STORE STRUCTURE VETLAND LIMITS (THE-) ORDUT FILL & ABANDON 1D" IN PLACE EXTERIOR FACE OF WALL AT BASELINE #2 HORTHHAD 2084018.87 EXETING: 1107713.40 PROPOSED INSER-SPRUCTURE, FON, SEE DWG. 69.7-12 PROPOSIDE DUCT 1 D"-/ 8.6 COMPLET REPORT TOLICIAN SEE DWG. 68.7-12 32-4 NORTHING: 2000018-07 DASTING: 1107804.07 ø NORTHING 2060018.87 EXCTING: 1107608.66 -0-INCLE FILL & JENDEOR-IN PLACE MAN DOOR SEE 68.7-13_52015-8205 P ŧΦ 10.00 10-0 287-87 C D P CР 0 -----В 0 0 -----EXTERIOR FACE OF WALL AT BASELINE #11 NORTHING: 20030898.05 EASTING: 1107684.07 "1D" 1D" 0 0 0 0 (MILLINE RE) (maint fr) EXERTIME SUBSEMPTION FENCE-10 BE REMOVED DITEROR FACE OF WALL (Manuel) AT BASELINE #1 NORTHING: 2058899.96 EASTING: 1107903.66 ٣ 0 0 唐 - $10^{\circ}-0^{\circ}$ -0-17 0 0 CROUT FILL & ADANCOM-IN FLACE COMPRETE APRON (TVP.) STRUCTURAL PLOSD DOOP SEE SHEET 507 5HET 68.7-7_52015-0205 F0R DETAIL 68.7-2_52015-0208 POR SEE 69.7-13_52015-0005 10-0 HORTHING: 2059792.97 [DISTING: 1107729.65 NORTHING: 2059762.97 [EXSTING: 1107739.66] 57-37 NORTHING: 2059792.97 EXETING: 1107903.65 HORTHING: 2059782.97 EASTING: 1107684.07 оная цик роксе нея сагол. нее сонера, ноге ра 52'-17 37 - 780-0 11-11 ø EXTERNOR FACE OF WALL LIPT STATION (SET UPT STATION DETAILS SHEET 68.7-11...12015-0205) 10. AT ENCELINE (S) HORTHING: 2059782.97 EASTING: 1107713.40 SHING GATE .

NORTHING 2060114.87 EXETTING 1107903.86

NORTHING: 2060114.07 EARTING: 1107808.68

1037-0

And then...

We built it, everyone loved it, and they lived happily ever after.

Challenges

Safety, Safety, Safety

Preserve Substation Security

Maintain Clearances

Public Perception

There's a Reason it's Cheap Land... Resolutions

Entry by Trained Personnel, Design for Constructability Around Electrical Hazards

Design for Secure Entry, Ease of Operations and Rogue Rowboats

Design Improvements when Necessary to Maintain or Attain Better Clearance

Coordinate with Locals About Sensitivity, Conduct Public Meetings

Expect a Great Deal of Regulatory Hoops, Be Prepared when Jumping through Them All

Mitigation Action Challenges

Federal, State and Local governments are Set Up to Serve the Public and Stakeholders.

Private Companies Answer to Customers, Boards, Executives, Commissions, Shareholders, and More.

Have Meetings Early and Often.

Communicate the Plan, the Design, the Methods.

Communicate the BENEFIT.

Accept that Perception is Someone's Reality – and Manage the Project within that Perception

Leave the Area in Better Condition than when You Started – the Site, the Reach, the Watershed.

Closeout the Project as Partners in Mitigation.

The Key to Success:

Collaboration





