Preparing for the Worst, Expecting the Best
Removing the Guessing from Pipeline Contingency Planning and Response Strategies

November 14, 2017
Goals of an Emergency Response Plan

Supplement Other Spill Response and Contingency Plans to:

- Rapidly Restore Service
- Minimize Short and Long-term Impacts
  - Environment
  - Public Health and Well-being
  - Economic Interests
- Effective Communication with Stakeholders
Goals of an Emergency Response Plan

Provide a standardized response and recovery protocol after failure

Rapidly Restore Service
- Minimize impact on customers
- Minimize impact on environment

Minimize Impact on System
- Protect Employee Safety
- Protect Capital Investments
- Improvements to Reduce Risk

Effective Communication
- Keep Stakeholders Informed
- Facilitate Information among Response Team
Purpose of an Emergency Response Plan

Well-planned Emergency Response

- Cycle of planning, training, testing, and improvement
- Framework for better decision making
  - Risk management and mitigation
  - Capital improvements to reduce vulnerability
  - Better internal and external communication
  - Emergency contracting and identification of specialty resources
Qualifiers for an Emergency Response Plan

**Preparedness**
Prepared to handle an incident
- Knowledge of System
- Training
- Equipment and Contractors

**Risk Mitigation**
Prevention / minimization of future incidents
- Infrastructure Improvement Recommendations and Long Term Construction Plan for Permanent Solutions
- Additional Monitoring Recommendations

**Response and Recovery**
Responding safely to an incident and restoring service
- Incident Detection and Classification
- Activation of Response and Recovery Plans
- Incident Management and Stakeholder Notifications

**Termination**
Return to desired service level
- Closeout Response and Recovery Plan
- Documentation and Lessons Learned
Emergency Response Plans (ERPs) should be:

- Site specific
- Capable of implementation as intended
- Prepared in accordance with best practices, including Department of Homeland Security (DHS) Incident Command guidelines
Best Practice Considerations

National Incident Management System
- Incident Command System

Industry publications for framework:
- WERF Emergency Response Plan for Wastewater Systems
- WEF Emergency Planning, Response and Recovery
- Federal Area Contingency Planning Guides
- RCAP Emergency Response Planning Template for Public Wastewater Systems
- Water Pollution Contingency Plan
Training Resources for Incident Command

From DHS - https://training.fema.gov/is/crslist.aspx?all=true

- Introduction to ICS (IS100)
- ICS for Single Resources and Initial Action Incident (IS200)
- National Incident Management System (NIMS) – An Introduction (IS700)

National Response Framework – An Introduction (IS800)

Texas A&M Engineering Extension Service (TEEX)
The purpose of a WARN is to provide a method whereby water/wastewater utilities that have sustained or anticipate damages from natural or human-caused incidents can provide and receive emergency aid and assistance in the form of:

- personnel,
- equipment,
- materials and
- other associated services as necessary.
Steps for Developing an Effective ERP

Select ERP Candidates
- Risk Assessment
- Criticality: CoF vs LoF

Establish Format for ERP
- Gap Analysis for Existing Programs
- Use Framework to promote Preparedness, Response and Recovery

Develop ERP
- Use Framework to Create ERP
- Should Complement Existing Response Plans
- Not too prescriptive

Test ERP and Improve
- Tabletop Exercise Recommended to Test Plan and the Stakeholders
- Update ERP with Periodic Improvements as Process Evolves
Candidate for an ERP

Use a risk-based approach:

- Consequence of Failure vs Likelihood of Failure
- Consider Triple Bottom Line (TBL)
  - Tangible Economic Costs
  - Social Costs
  - Environmental Concerns
Candidate for an ERP

Use a risk-based approach:

Consequence of Failure vs Likelihood of Failure
What Guides Are Available for an ERP?

Consider industry publications for framework:

- WERF Emergency Response Plan for Wastewater Systems
- WEF Emergency Planning, Response and Recovery
- Federal Area Contingency Planning Guides
- RCAP Emergency Response Planning Template for Public Wastewater Systems
- Water Pollution Contingency Plan
## Establish Format for ERP

<table>
<thead>
<tr>
<th>Potential Contingency and Emergency Response Plan Elements</th>
<th>WERF ERP for WW</th>
<th>WEF Emergency Planning</th>
<th>Federal Area Contingency Planning</th>
<th>RCAP Emergency Response Planning Template</th>
<th>Water Pollution Contingency Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Background Information</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revision Log</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Purpose</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Response Plan vs Existing Programs</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Infrastructure Description/Vulnerabilities</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td><strong>Prepare</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Training</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Partnership Agreements</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Equipment Suppliers and Contractors</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td><strong>Risk</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Infrastructure Modification Recommendations</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Additional Monitoring Recommendations</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td><strong>Response Phase</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Detection</td>
<td>●</td>
<td>●</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Emergency Classification</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Internal Organization, Roles and Responsibilities</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>External Stakeholder Notification Process</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Response Action Plans</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>Recovery and Termination Phase</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
</tbody>
</table>
ERP Format Examples:

1. Used for a Gap Analysis of Existing Plans
2. Augmented to reflect Program Goals and Risk
3. Scaled appropriately for the organizational size, main size and length
Common ERP Gap Analysis Findings

Mapping Inconsistencies:

Inaccurate or incomplete record drawings
- Horizontal and Vertical Alignment
- Casing pipes and encasement

Lack of appropriate access for response and recovery
- Easements not cleared
- Alignments in easement not marked or staked
- Pipeline structural integrity not able to support response equipment
Common ERP Gap Analysis Findings

Training, Equipment and Contractors:

Lack of Detail for Responders
- Lack of proper repair materials
- No flow data or anticipated flows during event for pump and haul or bypass
- Inadequate access to specialty contractors and suppliers
- Inadequate access routes for first responders

No Tabletop Exercise or Vetting of Response Plan
Common ERP Gap Analysis Findings

System Monitoring and Improvements:
No Correlation of PS Flow and Pressure Data to Pressure Main Risk
• Neglecting Improvements to Reduce Risk
  ▪ No emergency bypass at PS
  ▪ Valving and air relief on main
  ▪ Addressing transients
Not Inspecting High Risk Mains
Common ERP Gap Analysis Findings

Detection and Activation of Response and Recovery

- Lack of Leak Detection or Main Break Monitoring
- Disconnect between Customer Calls and First Responders
- Incident Command not Sufficient for the Failure Scenario
- Unclear Stakeholder Involvement
  - When to activate mutual assistance agreements?
  - Traffic Control?
  - Media and Public Outreach?
Common ERP Gap Analysis Findings – Incident Command

Incident Manager

Public Information Manager

Advisory Support Incident Manager

Operations Manager

Field Response Operations, Emergency Contractors, Failure Documentation

News Media, Customer Information, Affected Business Owners

Legal Council, Safety Risk, Spill Reporting

Response and Recovery: Responding safely to an incident and restoring service
Common ERP Gap Analysis Findings – Incident Stages or Tiers

Incident Stage 1: Non-Catastrophic Event
- Near normal operations
- Localized, little/no external assistance
- Response:
  - No Incident Management Team
  - Follow standard protocols for recon and response

Incident Stage 2: Catastrophic Failure Event
- Limited to extensive external assistance
- Response:
  - Establish Incident Management Team
  - Activate suitable Recovery Plan
Common ERP Gap Analysis Findings

Termination

• Are we done yet?
• What did we learn?
• How do we apply it to the response plan?
• What system improvements do we fund?
ERP Strawman

Introduction and Purpose
- Intent of the document
- Documentation of Reviews and Improvements
- Relationship to existing response plans

Background Information
- Existing mapping
- Flow rates
- Areas of high risk and vulnerabilities
ERP Strawman

Risk Mitigation
- Review of existing in-house capabilities
- Identify needed external assistance
  - Specialty contractors
  - Materials and specific repair details

Implement monitoring and proactive condition assessment
- Pressure, Acoustic, Flow and Transient Monitoring
- Condition Assessment
  - Inspection costs <25% of main replacement costs
  - Inspection cost threshold decreases as main age increases
ERP Strawman

Incident Response and Recovery
  • Defining a candidate event
    • Incident Command required?

First Responder actions
  • Detection
  • Flow Control
  • Emergency repairs in-house or contracted

Stakeholder notification and involvement
Termination and Lessons Learned
Closing Thoughts

1. Determine if an Emergency Response Plan is appropriate

2. ERPs are complementary but do not replace existing plans

3. Plans should be succinct and easy to understand/implement

4. Vet or test ERP with staff to get full value from the document
Questions?