Preparation of Flood Contingency Plans

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Why it’s important

Average Gross Losses from Flood (1989-1999)

$4,200,000

$1,200,000

118 Losses Due to Flood Emergency Response

39%

61%

Effective Plans

Ineffective Plans

Source: FM Global
Why it’s important

<table>
<thead>
<tr>
<th>Period of Time</th>
<th>50-Year Flood</th>
<th>100-Year Flood</th>
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</thead>
<tbody>
<tr>
<td>10 years</td>
<td>18%</td>
<td>10%</td>
</tr>
<tr>
<td>15 years</td>
<td>26%</td>
<td>14%</td>
</tr>
<tr>
<td>20 years</td>
<td>33%</td>
<td>18%</td>
</tr>
<tr>
<td>25 years</td>
<td>39%</td>
<td>22%</td>
</tr>
<tr>
<td>30 years</td>
<td>45%</td>
<td>26%</td>
</tr>
</tbody>
</table>

Source: FM Global
1. Identify objectives
2. Identify implementation personnel
3. Evaluate flood risk
4. Identify evacuation routes
5. Identify specific tasks
6. Other considerations
Plan Elements

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Plan Objectives

- Protect life and property
- Prepare for downtime
- Minimize clean up duration
- Maximize resiliency
Something to keep in mind...

2013 U.S. Flood Fatalities
Activity of Victims

- Driving: 53%
- Sheltering: 19%
- Walking: 14%
- Working: 8%
- Other: 4%
- Fell In: 2%

Source: NOAA
Plan Elements

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Implementation Personnel

- Primary person responsible for implementing the plan
- Alternate person responsible for implementing the plan
- Delegate responsibility to implement specific portions of the plan
- Consider personnel safety, well-being and relief of personnel
- Provide contact numbers for primary and alternate contacts, police, EMS, fire, and emergency operations
Plan Elements

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Flooding Sources

- Check FIRM
- Review aerial mapping
- Groundwater infiltration
- Ground reconnaissance
  - Plugged storm sewers
  - Other obstructions
  - Hidden surprises!
Warning times

Tropical Storms/Hurricanes
Days in advance

Large Rivers
Days in advance

Small Streams
Very little warning
Plan Elements

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6. Other considerations
Evacuation Routes

- Identify routes to and from the facility
- Coordinate with local emergency plans
- Preference is for immediate access to dry land
- Short sections may possibly be bridged
Evacuation Routes

- Consider if emergency access is required
- Mode of transportation?
- Consider vulnerable populations
Plan Elements

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5. Identify specific tasks
6. Other considerations
Specific Tasks

■ Educate facility users
■ Plan update schedule
■ Ensure supplies are adequate
■ Ensure human intervention flood items are available, accessible, and serviceable
■ Review evacuation routes
■ Test generators
Potential Strategies

■ Non-Residential

- Permanent flood barriers
- Raise equipment above flood levels
- Temporary barriers
- Move high-value stocks and supplies to higher ground or floors
- Organize actions into individual steps
- Cover all time periods
- Have adequate clean up resources on hand
- Regular training
Potential Strategies

■ Residential

- Discourage sheltering in place
- Temporary flood barriers
- Raise equipment above flood levels
- Organize actions into individual steps
- Cover all time periods
- Have adequate clean up resources on hand
- Regular training
- Keep residents informed
Plan Elements

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Special Considerations

■ **Construction**
  – Stockpiling of materials
  – Location of equipment
  – Anchoring of materials

■ **Material storage**
  – Hazardous
  – Buoyant
  – Flammable
  – Expansive
  – Corrosive

■ **Coordination with local Emergency Operations Plan**
Keys to success

- Identify roles and responsibilities
- Shut down and isolate electrical equipment
- Raise and or relocate key equipment and materials
- Minimize water infiltration
- Plans to take care of employees
- Post-flood repair and business recovery
- Regular training
- Regular updates