

October 15—18, 2017
St. Simons, Georgia

**2017 EXECUTIVE
MANAGEMENT
CONFERENCE**



Continuous Assessments of Vulnerabilities to Improve Capital Investment Planning

Onondaga County Water Authority

October 2017

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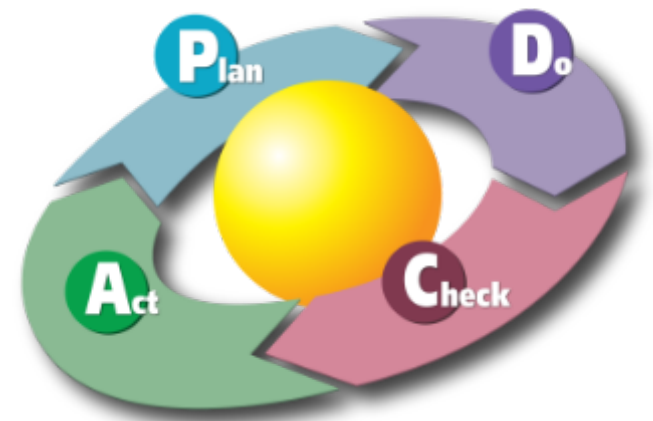
Barton & Loguidice



Agenda

1. What is OCWA
2. J100 Standard for Risk and Resilience Management
3. Risk Assessment and Managing Assets
 1. Counter Measure Valuations
 2. Risk Management
 3. Elements of Risk
4. Questions

**Not A Project
But Continuous
Improvement Program**





What is OCWA

- Onondaga County Water Authority
- Located in Central New York
- Formed in 1951 as a Public Benefit Corporation – NYS Authority Law
- Began operation in 1955 after purchase of New York Water Service's Assets
- Provided water to suburbs of Syracuse, NY

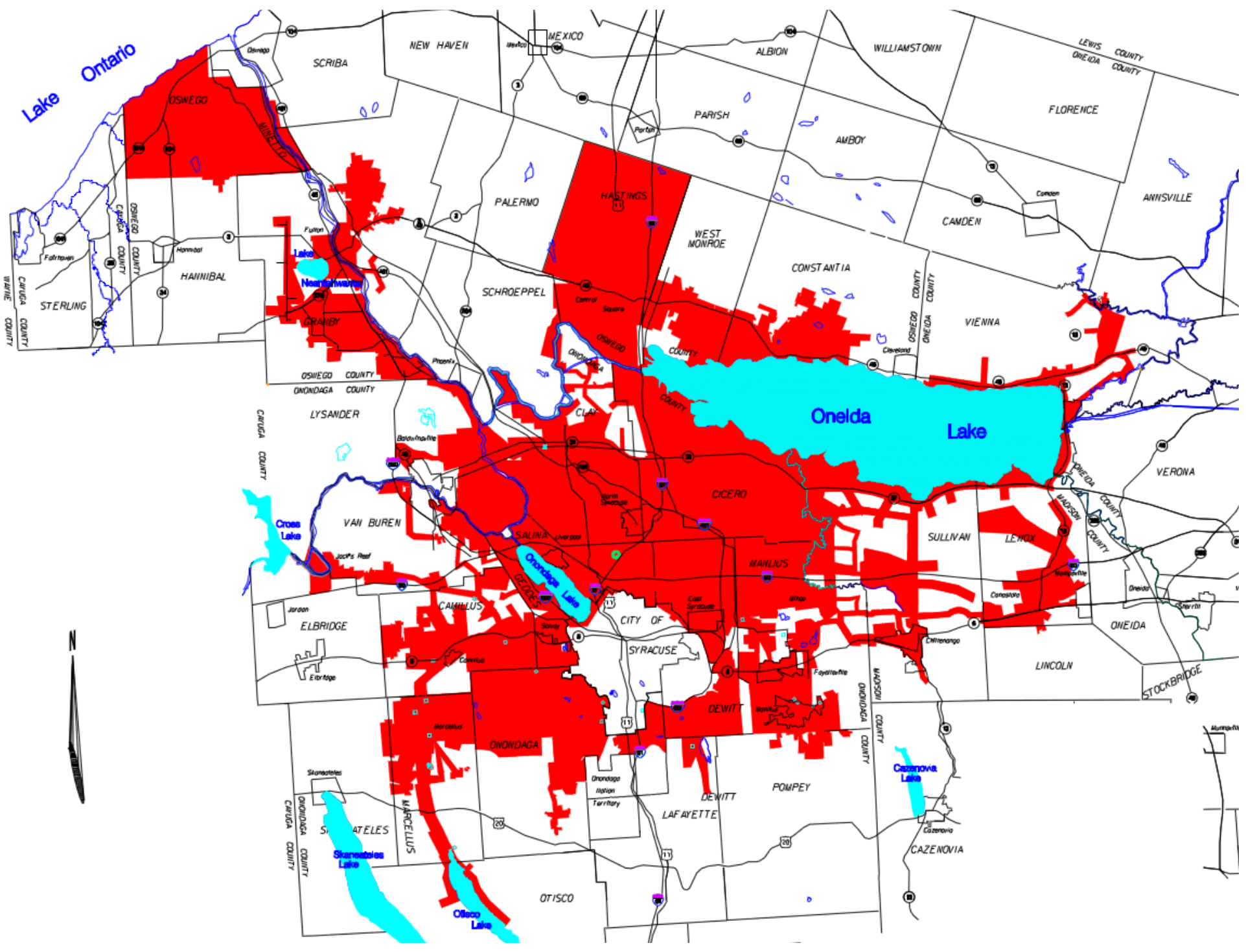




OCWA System Overview

- Total system delivery – 38 MGD
- From Otisco Lake WTP – 18 MGD
- From Lake Ontario – 19 MGD
- From Skaneateles Lake – 1 MGD
- Population served – 500,000
- Storage facilities – 54
- Pumping facilities – 47
- 2,040 miles of water main
- 13,000 fire hydrants
- 70 + Pressure Zones
- 175 Sites







OCWA's Continuous Growth and Consolidation

- OCWA continues to expanded in Central New York
- Now serves a 5 County area including portions of Onondaga, Oswego, Madison, Cayuga, and Oneida Counties
- One of the largest Public Water Suppliers in the NY State





OCWA Statistics

- ~ 102,000 + Customer Accounts Served
- ~ 340,000 People Supplied Water
- 38 Million Gallons of Water Delivered Each Day
- 2,000 + Miles of Water Main Maintained
- 1 Treatment Plant
- 54 Tanks
- 41 Pump Stations
- 70 Pressure Zones Operated
- **175 Sites**



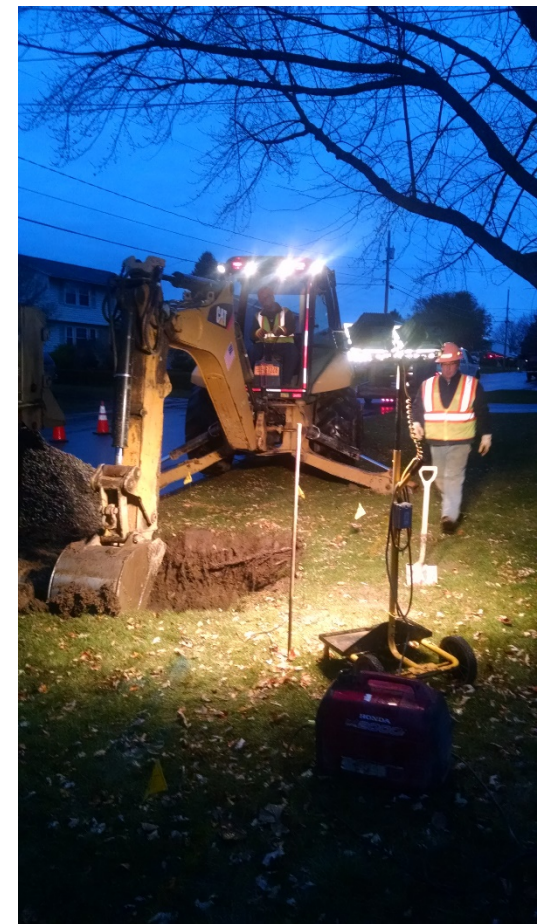


Risk Analysis and Management for Critical Asset Protection (RAMCAP®)

In May 4, 2010 the RAMCAP Standard for Risk and Resilience Management of Water and Wastewater Systems Using the ASME-ITI RAMCAP Plus Methodology was published

Tools to help develop a risk assessment become available including:

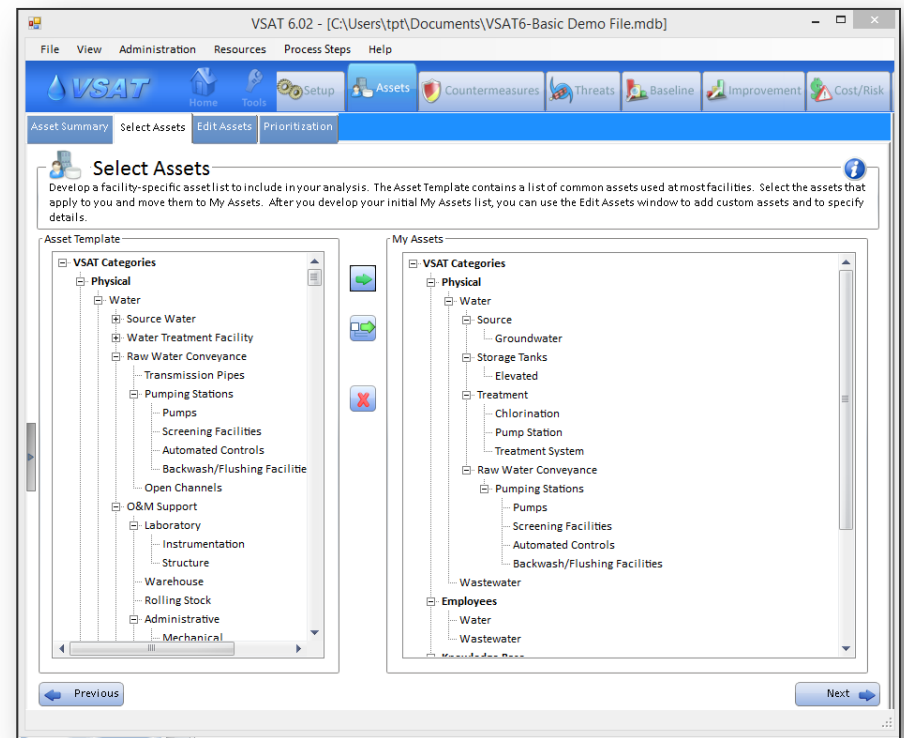
1. Risk Assessment Methodology—Water (RAM-W™)
2. Vulnerability Self-Assessment Tool™ (VSAT™)





Vulnerability Self-Assessment Tool (VSAT) 6.0

EPA developed the Vulnerability Self-Assessment Tool (VSAT) to assist water and wastewater utilities of all sizes with determining vulnerabilities to both man-made and natural hazards and with evaluating potential improvements to enhance their security and resiliency.





Risk Assessment Criteria is not a Good Match for OCWA

- Stand-alone database, not integrated with other systems
- Difficult to manage a large number of assets / sites
- No tracking of status of recommendations
- Limiting in how risk was captured

VSAT 6.02 - [C:\Users\tp1\Documents\VSAT6-Basic Demo File.mdb]

File View Administration Resources Process Steps Help

VSAT Home Setup Assets Countermeasures Threats Baseline Improvement Cost/Risk Results & Reports

Asset Summary Select Assets Edit Assets Prioritization

Prioritization

Please consider the potential Worst-Case Consequences for Each Asset that you have identified. You may evaluate one or all categories. Only those assets that have at least one High or Very High consequence will be included in the risk assessment unless you check the Include override box. Use the Scale of 1 to 10 where 1 is little if any consequence and 10 is highest consequence.

| Assets | Fatalities | Injuries | Utility | Region | Environment | Public Confid | Defense | UD1 | UD2 | Priority |
|----------------------|------------|----------|---------|--------|-------------|---------------|---------|-----|-----|----------|
| Physical | | | | | | | | | | |
| Water | | | | | | | | | | |
| Raw Water Conveyance | | | | | | | | | | |
| Pumping Stations | 8 | 7 | 4 | 6 | 6 | 4 | 7 | 9 | | |
| Backwash/Flushing | 6 | 4 | 4 | 7 | 9 | 9 | 7 | 5 | 4 | |
| Automated Controls | 6 | 4 | 2 | 1 | 6 | 8 | 9 | 5 | 7 | |
| Screening Facilities | 7 | 5 | 4 | 6 | 7 | 5 | 3 | 8 | 4 | |
| Pumps | 3 | 5 | 7 | 3 | 7 | 8 | 9 | 2 | | |
| Source | | | | | | | | | | |

Prioritization Scale Color Code

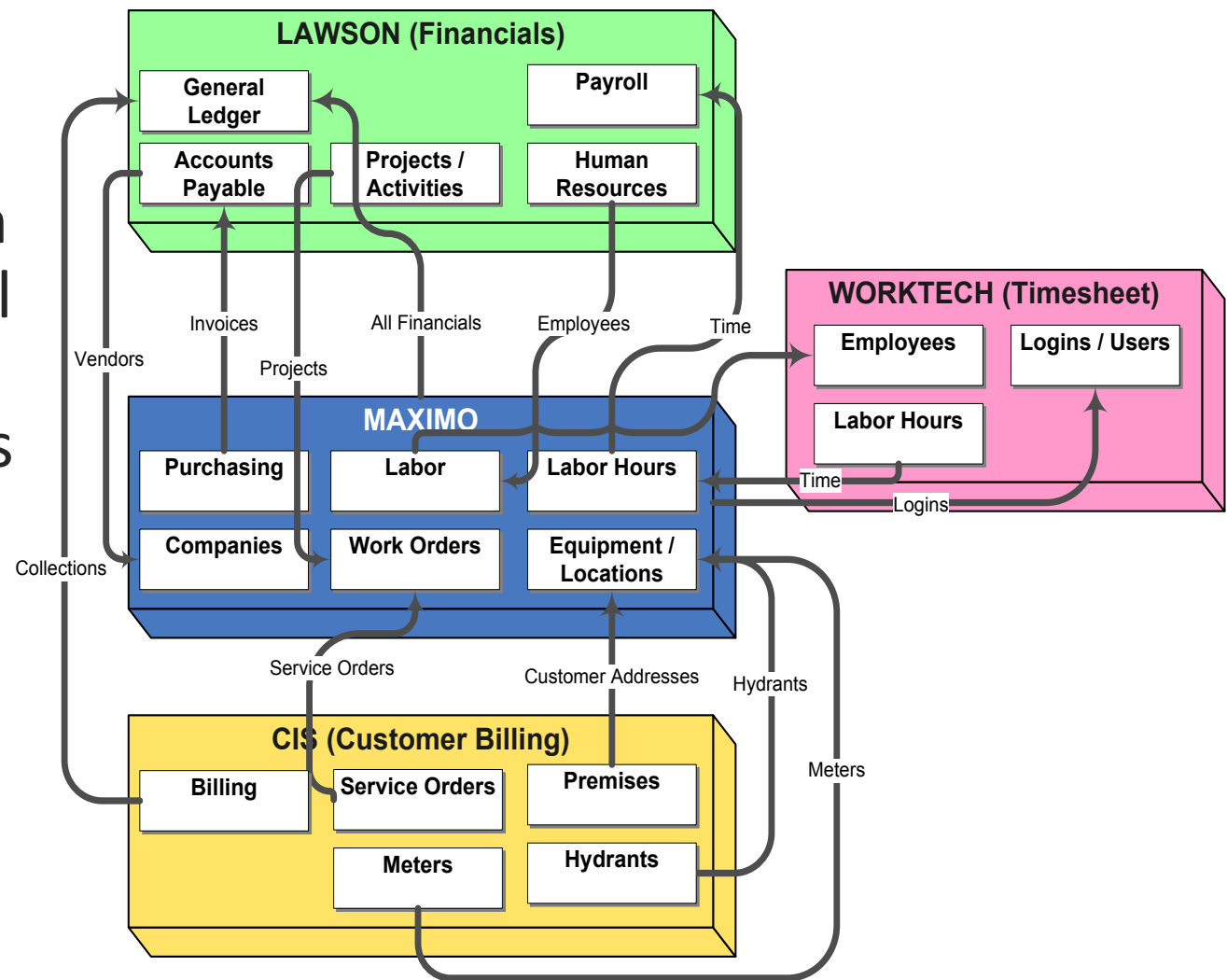
| Level | Numeric range | Color |
|-----------|---------------|--------|
| Low | 1 - 3 | Green |
| Medium | 4 - 6 | Yellow |
| High | 7 - 8 | Orange |
| Very High | 9 - 10 | Red |

Previous Next



OCWA's Maximo Asset Management System

Implemented in 2003 – a central component for their operations



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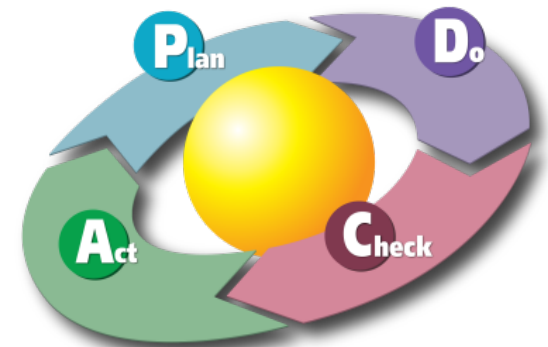
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1

Risk Assessment

**Assess the Consequence of a
Successful Threat and Likelihood it
is Going to Occur**





Risk Characterization

$$R = C \times V \times T, \text{ where}$$

Consequence (C) is the result of an event occurrence, including immediate, short- and long-term, direct and indirect losses and effects.

Vulnerability (V) in VSAT is viewed as a function of countermeasure capabilities to withstand a threat.

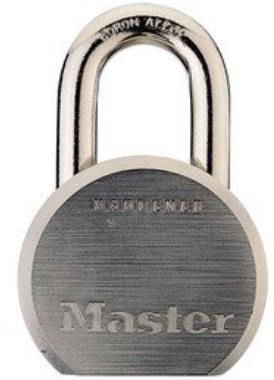
- Assessment of Counter Measures

Threat Likelihood (T), also referred to as the probability of occurrence, is the probability of the event occurring.



Five Classifications of Countermeasures

1. Consequence Reduction
2. Delay
3. Detection
4. Response
5. Other





Countermeasures

| Facility Type | | | | | | | | | | | Class | Type | Counter Measure | | |
|---------------|---------------------|--------------------|----------------------------|---------------------|------------------------|--------------------|---------------------|------------------|--------------|-----------------|-------|-------|-----------------|------------------------------------|------------------------------------|
| Elevated Tank | Ground Tank - Steel | Large Pump Station | Meter or Control Valve Pit | OCWA - Organization | Ground Tank - Concrete | Small Pump Station | Facility / Building | Tank - Standpipe | Intake / Dam | Treatment Plant | | | | | Underground Reservoir |
| Y | Y | Y | Y | | Y | Y | Y | Y | Y | Y | Y | Delay | Barriers | Bollards | Bollards |
| | | Y | | | | Y | Y | | | Y | | Delay | Barriers | Bullet Resistant Windows | Bullet Resistant Windows |
| | | Y | | | | Y | Y | | | Y | | Delay | Barriers | Films for glass shatter protection | Films for glass shatter protection |
| | | | | | | | | | | | | Delay | Barriers | Jersey barriers | Jersey barriers |
| | | | | | | | | | | | | Delay | Barriers | King-tut blocks | King-tut blocks |
| | | | | | | | | | | | | Delay | Barriers | Outfall entry barrier | Outfall entry barrier |
| | | | | | | | | | | | | Delay | Barriers | Perimeter concrete wall | Perimeter concrete wall |
| Y | Y | Y | Y | | Y | Y | Y | Y | Y | Y | Y | Delay | Barriers | Perimeter fencing | Perimeter fencing |
| Y | Y | Y | Y | | Y | Y | Y | Y | Y | Y | Y | Delay | Locks | Hardened doors, welded hinges | Hardened doors, welded hinges |
| Y | Y | Y | Y | | Y | Y | Y | Y | Y | Y | Y | Delay | Locks | Hardened gates | Hardened gates |
| Y | Y | | | | Y | | | Y | | | | Delay | Locks | Hardened ladder access | Hardened ladder access |

- Elevated Tank
- Ground Tank - Steel
- Large Pump Station
- Meter or Control Valve Pit
- OCWA - Organization
- Ground Tank - Concrete
- Small Pump Station
- Facility / Building
- Tank - Standpipe
- Intake / Dam
- Treatment Plant
- Underground Reservoir



Countermeasure Assessment

VAS Assessment Mobile

Location: SITE030 Hinsdale PS, Fairmount Reservoir / Service

Vulnerability Assessment 1 - 16 of 23

| Counter Measure | Description | VAS Type |
|-----------------|------------------------------------|-----------------------|
| VAS-CPBAC | Backup key documents | Consequence Reduction |
| VAS-DACAR | Carbon monoxide detectors | Detection |
| VAS-DACAR | Card-key badge system | Detection |
| VAS-DACON | Continuous process monitoring | Detection |
| VAS-DAFIR | Fire detectors | Detection |
| VAS-DBBOL | Bollards | Delay |
| VAS-DBBUL | Bullet Resistant Windows | Delay |
| VAS-DBFIL | Films for glass shatter protection | Delay |
| VAS-DBPER | Perimeter fencing | Delay |
| VAS-DCFIX | Fixed cameras | Detection |
| VAS-DCMAN | Manual pan-tilt-zoom cameras | Detection |
| VAS-DEFEN | Fence-associated sensors | Detection |
| VAS-DEFRE | Freestanding sensors | Detection |

Enter Meter Readings

Meters 1 - 20 of 23

| Counter Measure | New Reading | New Reading Date | Notes |
|------------------------------------|-------------|------------------|-------|
| Backup key documents | | | |
| Backup power generation on-site | | | |
| Card-key badge system | | | |
| Continuous process monitoring | | | |
| Fire detectors | | | |
| Float Switch | | | |
| Bollards | | | |
| Bullet Resistant Windows | | | |
| Films for glass shatter protection | | | |
| Perimeter fencing | | | |
| Fixed cameras | | | |
| Manual pan-tilt-zoom cameras | | | |
| Fence-associated sensors | | | |
| Freestanding sensors | | | |
| Hardened windows | | | |
| Hardened gates | | | |
| Secured fill and vent pipes | | | |
| Secure manholes / hatches | | | |
| Landscaping maintenance | | | |
| Signage | | | |

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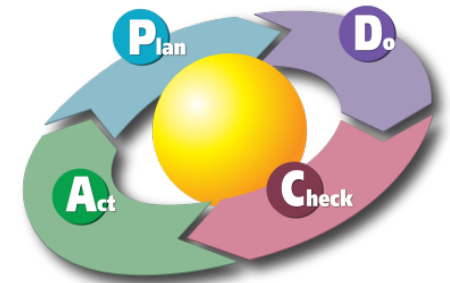
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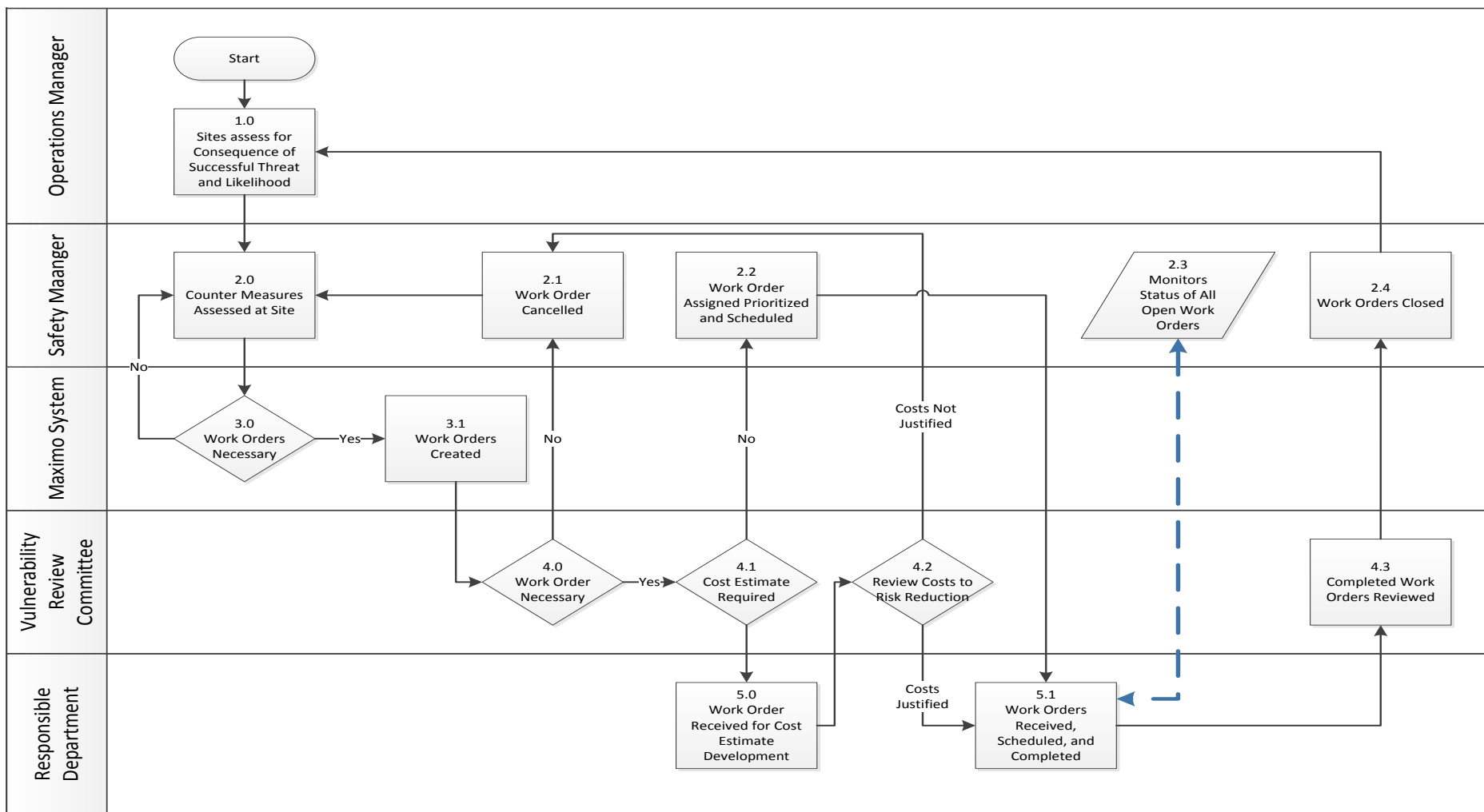
Countermeasure Assessment

**A measure or action taken to
counter or offset a threat**





OCWA VAS Business Process



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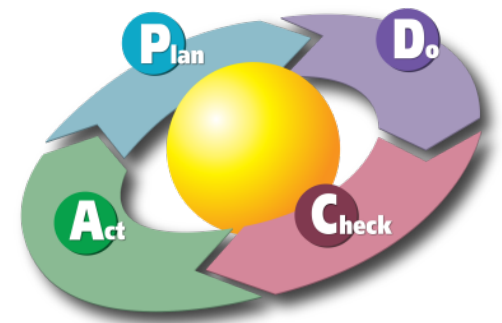
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3

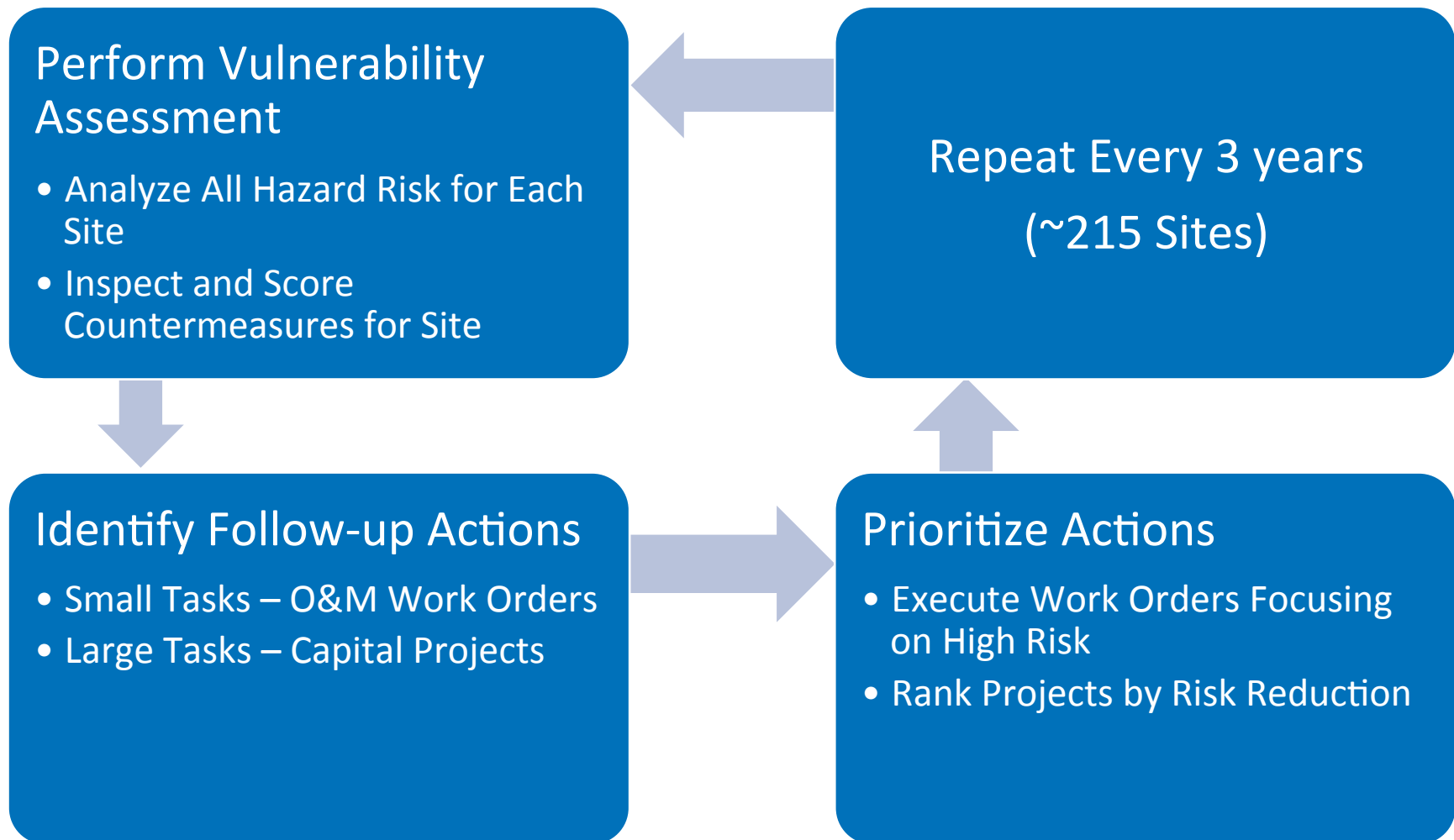
Improve and Implement Counter Measures (Work Orders) and Capital Planning Prioritization

Plan, Do, Check, Act





Prioritization of Resources





Track Progress of Site Assessments

Welcome,
IBM

Administration
Process Management Requester

Favorite Applications

Locations

- VAS Assessment Mobile
- Work Order Tracking

Sites Scheduled for Inspection

| Location | Town | Description |
|----------|------|---|
| SITE245 | TGRA | Granby Tank |
| SITE705 | TOSW | Rathburn Rd. |
| SITE295 | TLEN | Main Street (Canastota) Pressure Reducing Valve |
| SITE750 | TSAL | Buckley South Control Valve |
| SITE110 | TCIC | Pardee Road Control Valve |
| SITE575 | TONO | Howlett Hill Tank |
| SITE860 | TVAN | Winchell Road Tank |
| SITE345 | TMAN | Butternut South Control Valve |
| SITE329 | TMAN | Golden Heights Control Valve |
| SITE145 | TCLA | South Bay Road Control Valve |

1 - 10 of 153 | [Next Page](#) >>

VAS Work Orders

Chart Type: [BAR](#)

VAS Work Orders (By Status)

| Status | Count | Percent (%) |
|--------|-------|-------------|
| APPR | 4 | 22.22 |
| COMP | 2 | 11.11 |
| WAPPR | 12 | 66.67 |

[List View](#)

Sites In Need of Assessment

Last Run: 4/10/16 8:19 PM [Update](#)

| Status | Last Reading | Actual | Target | Variance |
|--------|--------------|--------|--------|----------|
| ↑ | 0 | 165 | 5 | 160 |

VAS Sites that need assessment

VAS Work Orders by Risk

| Work Order | Description | Risk Assessment | Status | Target Finish | Work Group | Location |
|------------|---------------------------------|-----------------|--------|-----------------|------------|----------|
| WO43713 | Perimeter fencing | 13.97 | WAPPR | 10/3/16 2:08 PM | 8501 | SITE445 |
| WO42503 | Manual pan-tilt-zoom cameras | 18.81 | APPR | 3/23/16 1:18 PM | 2002 | SITE030 |
| WO42505 | Landscaping maintenance | 18.81 | WAPPR | 10/3/16 2:16 PM | 8501 | SITE030 |
| WO42507 | Fixed cameras | 18.81 | APPR | 3/23/16 1:26 PM | 2002 | SITE030 |
| WO42509 | Hardened gates | 18.81 | WAPPR | 10/3/16 2:07 PM | 8501 | SITE030 |
| WO42511 | Carbon monoxide detectors | 18.81 | COMP | 10/3/16 2:06 PM | 8501 | SITE030 |
| WO43375 | Perimeter fencing | 24.07 | WAPPR | 10/3/16 2:06 PM | 8501 | SITE510 |
| WO43377 | Perimeter fencing | 10.4 | WAPPR | 10/3/16 2:05 PM | 8501 | SITE780 |
| WO43379 | Perimeter fencing | 23.66 | WAPPR | 10/3/16 2:05 PM | 8501 | SITE775 |
| WO43381 | Hardened Gates - Replace Door | 23.75 | APPR | 10/3/16 2:04 PM | 8501 | SITE225 |
| WO43383 | Signage - Westvale Pump Station | | COMP | 10/3/16 2:04 PM | 8501 | SITE235 |
| WO43385 | Landscaping maintenance | | WAPPR | 10/3/16 2:03 PM | 8501 | SITE235 |
| WO43387 | Hardened gates | 20.27 | WAPPR | 10/3/16 2:05 PM | 8501 | SITE240 |
| WO43389 | Perimeter fencing | 20.27 | WAPPR | 10/3/16 2:02 PM | 8501 | SITE240 |
| WO43391 | Landscaping maintenance | 16.49 | WAPPR | 10/3/16 1:59 PM | 8501 | SITE795 |
| WO45158 | Landscaping maintenance | 17.01 | WAPPR | 10/3/16 1:19 PM | 8501 | SITE285 |



Templates of Counter Measure Work

1. Identify generator requirements
 - a) Type of generator for the site (fuel)
 - b) RPM, frequency
 - c) Location, enclosures
 - d) Kilowatt rating, efficiency
 - e) Number of phases, power factor
 - f) Controls, related switchgear
 - g) Transfer switching and
 - h) Duty, starting conditions, etc.
2. Find location on site for generator

| | | | | | | |
|-----------|----------------------------|---|------|--------|-------------|--|
| VAS-DPSEC | Security awareness program | 0 | 0:00 | ACTIVE | MAINTENANCE | |
| VAS-DPSIG | Signage | 0 | 0:00 | ACTIVE | MAINTENANCE | |

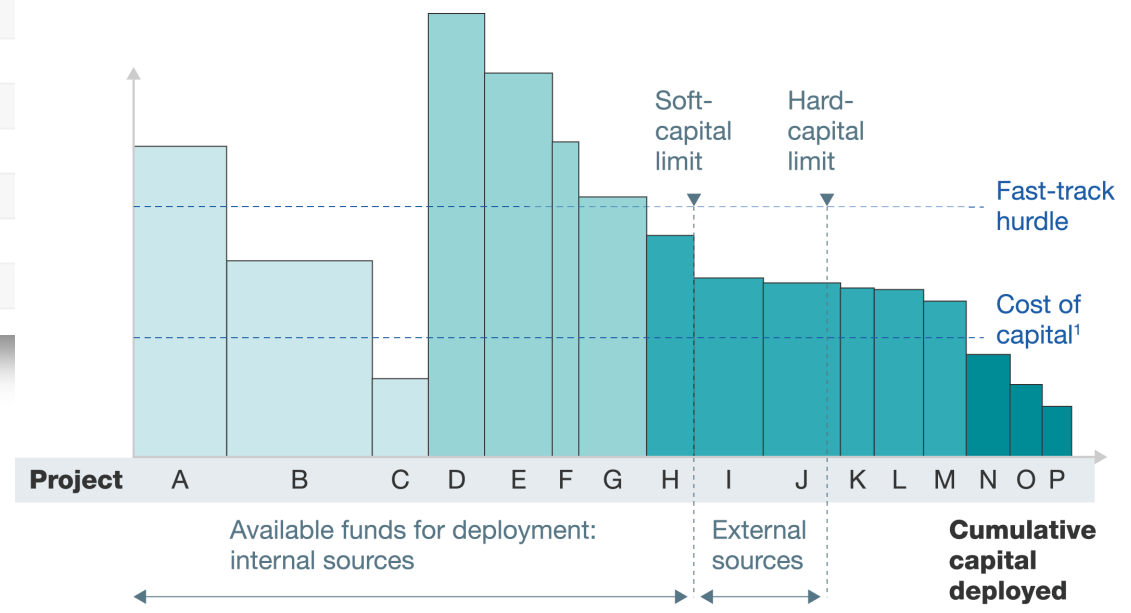


Detailed Tracking of Risk Reduction Costs Work Orders and Capital Projects

| Resource | Current Estimate | Approved Estimate | Actual | Exceeds Estimate by |
|----------------------|------------------|-------------------|---------|---------------------|
| Internal Labor Hours | 0.0000 | 0.0000 | 1.0000 | |
| External Labor Hours | 0.0000 | 0.0000 | 0.0000 | |
| Labor Hours | 0.0000 | 0.0000 | 1.0000 | |
| Internal Labor Cost | 0.0000 | 0.0000 | 51.1900 | |
| External Labor Cost | 0.0000 | 0.0000 | 0.0000 | |
| Labor Costs | 0.0000 | 0.0000 | 51.1900 | |
| Material Cost | 0.0000 | 0.0000 | 0.0000 | |
| Tool Costs | 0.0000 | 0.0000 | 0.0000 | |
| Service Cost | 0.0000 | 0.0000 | 0.0000 | |
| Total Cost | 0.0000 | 0.0000 | 51.1900 | |

Projects rank ordered, by risk-adjusted returns

■ Ongoing projects
■ Fast-track approval
■ Selectively approve
■ Decline approve



¹Weighted average cost of capital typically adjusted to eliminate double counting.



GIS Mapping Integration to Maximo

Formatted Address: 120 Topaz Trail, Camillus, NY 13031

Location: SITE025

Hidden Knolls Tank

Find Location

Map Satellite

An aerial satellite map showing a residential area. The map is mostly green, indicating dense trees. A winding road labeled "Topaz Trail" is visible. In the center-left, there is a white water tower. A blue pin marker is placed on the map near the water tower. The map interface includes a "Map" and "Satellite" toggle button in the top left corner of the map area.

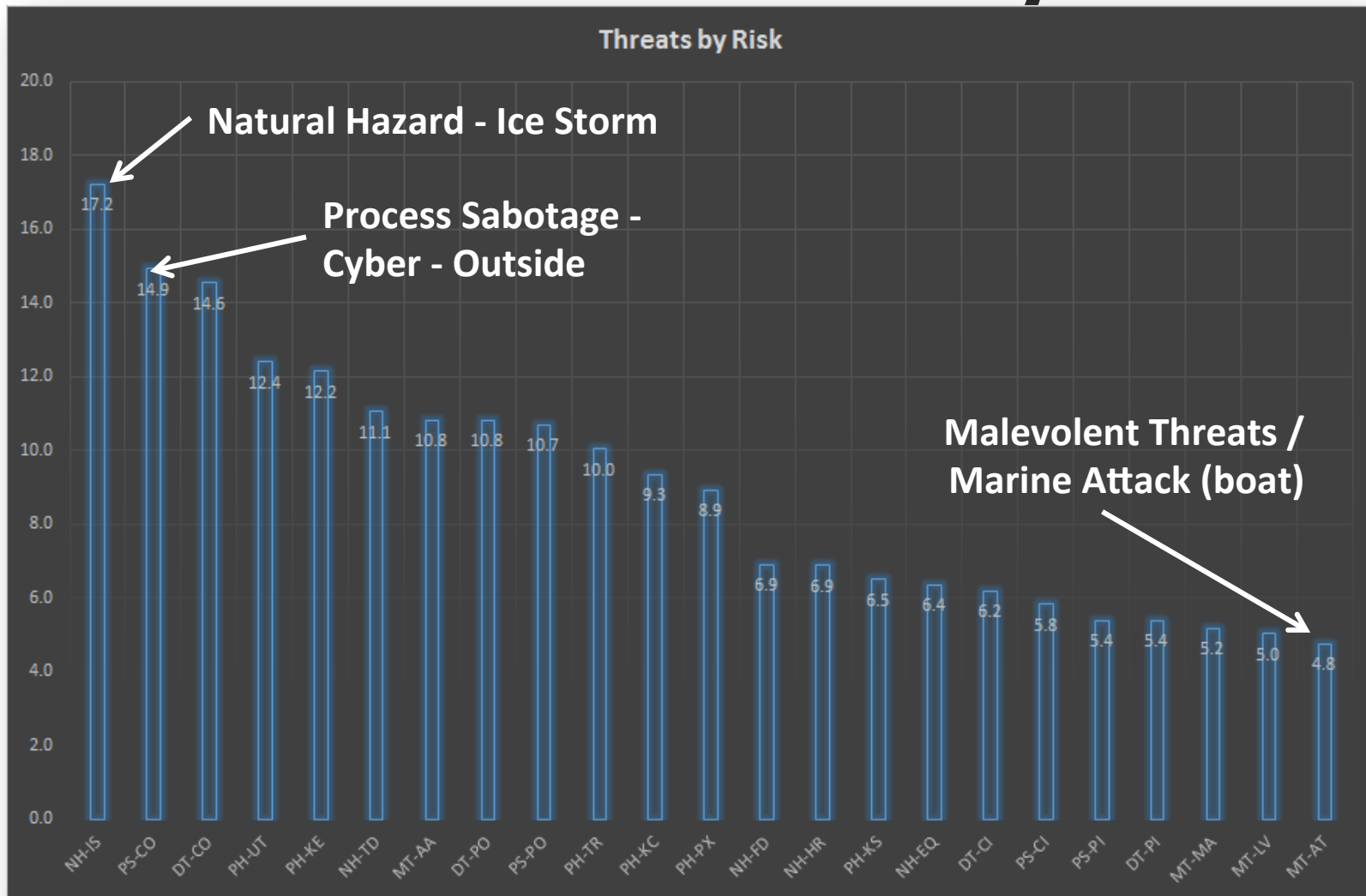


“Real-Time” Reports of Risks and Vulnerabilities

| Site ID | Site Description | Threat | Threat Description | Risk |
|---------|---|--------|--|-------|
| SITE510 | North Syracuse Tank | MT-AA | Malevolent Threats / Air Attack (plane / drone) | 24.07 |
| SITE510 | North Syracuse Tank | NH-IS | Natural Hazard Reference Threat Scenarios - Ice Storm (no power for 2 weeks) | 23.75 |
| SITE225 | Solvay Pump Station | NH-IS | Natural Hazard Reference Threat Scenarios - Ice Storm (no power for 2 weeks) | 23.75 |
| SITE775 | Park Street Pump Station and Control Valve | NH-IS | Natural Hazard Reference Threat Scenarios - Ice Storm (no power for 2 weeks) | 23.66 |
| SITE240 | Westvale and Solvay Tanks | NH-IS | Natural Hazard Reference Threat Scenarios - Ice Storm (no power for 2 weeks) | 20.27 |
| SITE775 | Park Street Pump Station and Control Valve | NH-FD | Natural Hazard Reference Threat Scenarios - Floods (1 week without facility) | 18.97 |
| SITE030 | Hinsdale PS, Fairmount Reservoir / Service Center | NH-IS | Natural Hazard Reference Threat Scenarios - Ice Storm (no power for 2 weeks) | 18.81 |
| SITE775 | Park Street Pump Station and Control Valve | PS-CO | Malevolent Threats / Process Sabotage - Cyber - Outside | 18.56 |
| SITE510 | North Syracuse Tank | PS-CO | Malevolent Threats / Process Sabotage - Cyber - Outside | 18.56 |
| SITE510 | North Syracuse Tank | DT-CO | Malevolent Threats / Diversion or Theft - Cyber - Outside | 18.56 |
| SITE775 | Park Street Pump Station and Control Valve | DT-CO | Malevolent Threats / Diversion or Theft - Cyber - Outside | 18.56 |
| SITE225 | Solvay Pump Station | DT-CO | Malevolent Threats / Diversion or Theft - Cyber - Outside | 18.56 |
| SITE225 | Solvay Pump Station | PS-CO | Malevolent Threats / Process Sabotage - Cyber - Outside | 18.56 |



Detail Risk and Threat Analysis





Risk Calculations Updated Every Day

- Identification of new vulnerabilities
- Each site assessed every 3-years
- Allows for ongoing evaluation of related capital needs
- Implementation of new countermeasures
- Flexibility to adopt and address critical needs in a more timely manner
- Re-assessment of the Likelihood – based on experience and changing situations

A screenshot of a software interface for risk management. The interface is divided into several sections. At the top, there are tabs for 'List View', 'Escalation', and 'Communication Log'. Below the tabs, there are various input fields and checkboxes for configuring an escalation rule. The 'Escalation' field is set to '1044' and 'Risk Scores Entered for Location'. The 'Condition' field contains a complex SQL query: 'siteid = 'OCWA'' AND (location LIKE '%SITE%' OR location = 'OCWA') AND location IN (SELECT location FROM vassite GROUP BY location HAVING COUNT(*) > 10)'. Other fields include 'Site', 'Organization', 'Active?' (checked), 'Schedule' (set to '1h,0,*****'), 'Create Successful Execution Entry?' (checked), and 'Last Run Time' (4/28/16 7:00 AM). Below the configuration fields, there is a 'Validation Results' section with a table of 'Escalation Points'. The table has columns for 'Escalation Point', 'Elapsed Time Attribute', 'Elapsed Time Interval', 'Interval Unit of Measure', 'Organization', 'Calendar', and 'Shift'. There is one row with the value '1'. Below the table, there are 'Actions' and 'Notifications' tabs. The 'Actions' section shows a table with columns for 'Action', 'Description', 'Type', and 'Sequence'. There is one action with ID '1019' and description 'Set vass1 for Locations with Risk Scores Entered SETVALUE', with a sequence of '10'. The interface includes various icons for filtering, sorting, and adding new rows.

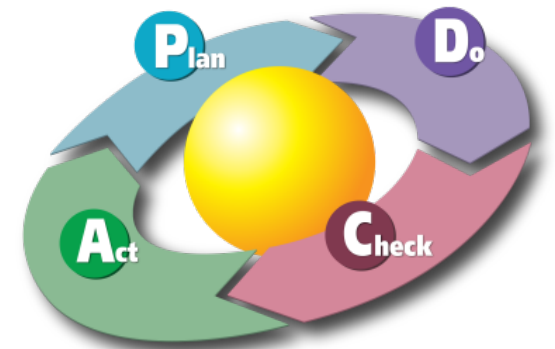
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Quantifying Risk





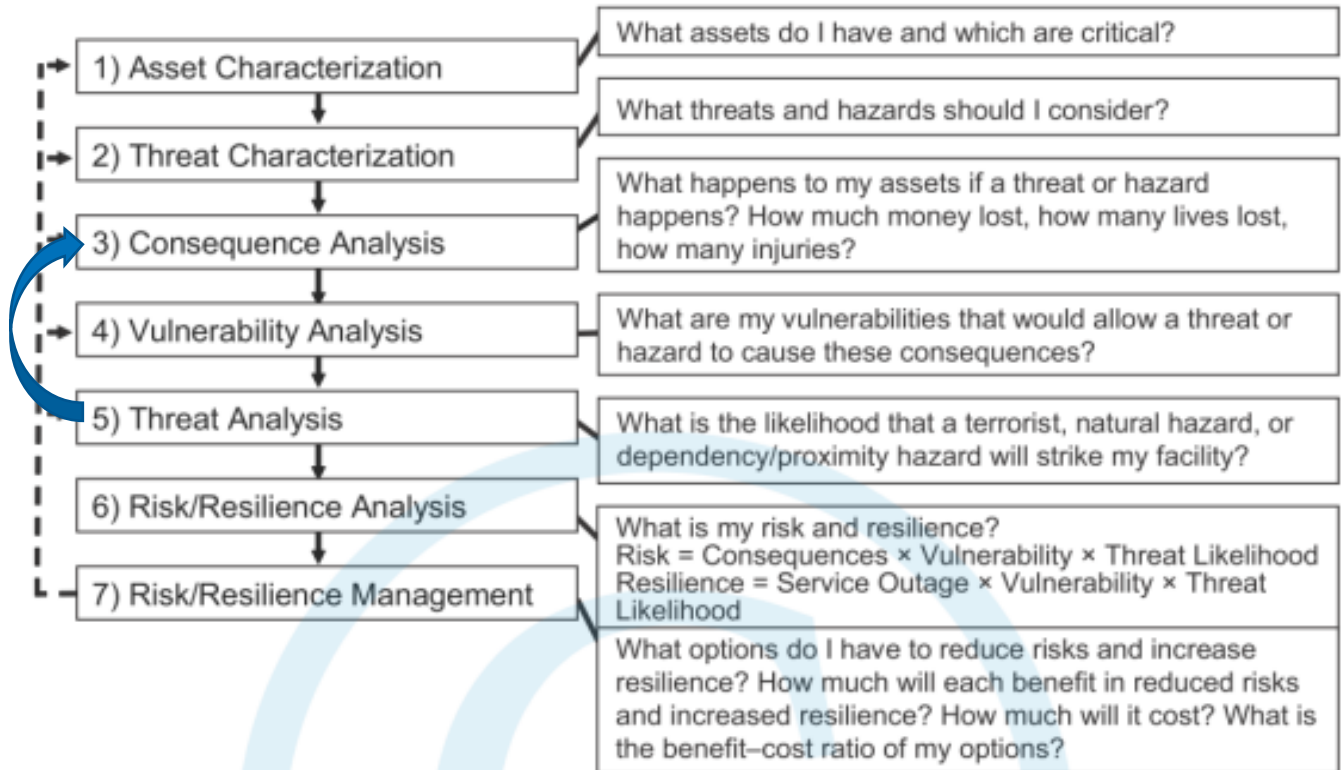
J100 Vulnerability Assessment Approach



Risk Analysis and Asset Protection

Risk and Management and Waste

Using the ASME RAMCAP Plus



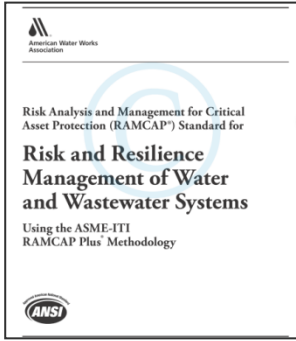


Risk Assessments Now Part of Design Reviews

$$R = C \times V \times T$$



- Consequence (C) is the result of an event occurrence, including immediate, short- and long-term, direct and indirect losses and effects.
- Vulnerability (V) is a function of countermeasure capabilities to withstand a threat.
- Threat Likelihood (T), also referred to as the probability of occurrence, is the probability of the event occurring.



Outside
Consultants



Health &
Safety



Engineering



Team Collaboration

Multi Discipline Assessment of the Risks



Operations



Information
Services



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Questions

**Continuous Improvements,
Not Just a Snapshot Program**



Risk – Organization of Threats

| Facility Description: MAXIMO ID: Facility Main Mission: | Consequence Analysis | | | | | | | 53% | 40% | 100% | Likelihood Success Occurrence | Natural Hazard Reference Threat Scenarios |
|--|----------------------|----------------|------------------------------|-------------------------|-----------------------|---------------------------|---|---|----------------------|---------|-------------------------------------|--|
| | 1% | 1% | 1% | 1% | 1% | 1% | 1% | | | | | |
| Otisco Dam / 5 Structures Onsite Including Chemical Treatment Threat Characterization | J100 | | | | | | | Primarily based on redundancy around site | Size of Service Area | (1 - 5) | Likelihood Success Occurrence | Dependency and Proximity Hazard Reference Threat |
| | Fatalities | Serious Injury | Financial Losses to the OCWA | Economic Loss to Region | Environmental Impacts | Loss of Public Confidence | Inhibiting National Defense or Government | | | | | |
| Natural Hazard Reference Threat Scenarios | | | | | | | | | | | | Hurricanes (2 weeks without power) |
| Hurricanes (2 weeks without power) | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 5 | 2.61 | 2 | Snow Storm (Blizzard) |
| Snow Storm (Blizzard) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 3 | Ice Storm (no power for 2 weeks) |
| Ice Storm (no power for 2 weeks) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 2 | Tornadoes (1 weeks without power) |
| Tornadoes (1 weeks without power) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 2 | Earthquakes (major damage to dam) |
| Earthquakes (major damage to dam) | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 0 | Floods (1 week without facility) |
| Floods (1 week without facility) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 1 | |
| Dependency and Proximity Hazard Reference Threat | | | | | | | | | 5 | | | Utilities (no pwr for 2 weeks) |
| Utilities (no pwr for 2 weeks) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 4 | Key Suppliers |
| Key Suppliers | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 3 | Key employees |
| Key employees | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 1 | Key Customers |
| Key Customers | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 3 | Transporation |
| Transporation | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 2 | Proximity |
| Proximity | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 2 | |
| Malevolent Threats / Contamination | 2 | 2 | 4 | 3 | 3 | 3 | 3 | 4 | 5 | 4.32 | 2 | Malevolent Threats / Contamination |
| Malevolent Threats / Process Sabotage | | | | | | | | | 5 | | | Malevolent Threats / Process Sabotage |
| Physical—Insider (shut the flow off, damage dam) | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1 | Physical—Insider (shut the flow off, damage dam) |
| Physical—Outsider | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 2 | Physical—Outsider |
| Cyber - Inside | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 1 | Cyber - Inside |
| Cyber - Outside | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 2 | Cyber - Outside |
| Malevolent Threats / Contamination | | | | | | | | | 5 | | | Malevolent Threats / Contamination |
| Malevolent Threats / Process Sabotage | | | | | | | | | 5 | | | Malevolent Threats / Process Sabotage |
| Physical—Insider | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 1 | Physical—Insider |
| Physical—Outsider | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 1 | Physical—Outsider |
| Cyber - Inside | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 2 | Cyber - Inside |
| Cyber - Outside | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 | 2.60 | 2 | Cyber - Outside |
| Malevolent Threats / Contamination | | | | | | | | | 5 | | | Malevolent Threats / Contamination |
| Malevolent Threats / Process Sabotage | | | | | | | | | 5 | | | Malevolent Threats / Process Sabotage |
| Physical—Insider | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1 | Physical—Insider |
| Physical—Outsider | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1 | Physical—Outsider |
| Cyber - Inside | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1 | Cyber - Inside |
| Cyber - Outside | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1 | Cyber - Outside |
| Malevolent Threats / Contamination | | | | | | | | | 5 | | | Malevolent Threats / Contamination |
| Malevolent Threats / Process Sabotage | | | | | | | | | 5 | | | Malevolent Threats / Process Sabotage |
| Physical—Insider | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1 | Physical—Insider |
| Physical—Outsider | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1 | Physical—Outsider |
| Cyber - Inside | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1 | Cyber - Inside |
| Cyber - Outside | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1 | Cyber - Outside |
| Malevolent Threats / Contamination | | | | | | | | | 5 | | | Malevolent Threats / Contamination |
| Malevolent Threats / Process Sabotage | | | | | | | | | 5 | | | Malevolent Threats / Process Sabotage |
| Physical—Insider | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1 | Physical—Insider |
| Physical—Outsider | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1 | Physical—Outsider |
| Cyber - Inside | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1 | Cyber - Inside |
| Cyber - Outside | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1 | Cyber - Outside |



Risk – Consequences of Occurrence

| OCWA Consequences of Failure | | Weighting |
|------------------------------|--|-----------|
| J100 | Fatalities | 1% |
| J100 | Serious Injury | 1% |
| J100 | Financial Losses to the OCWA | 1% |
| J100 | Economic Loss to Region | 1% |
| J100 | Environmental Impacts | 1% |
| J100 | Loss of Public Confidence | 1% |
| J100 | Inhibiting National Defense or Government | 1% |
| OCWA | Overall Impact to Service 1-Adequate supply of safe water 2-Adequate supply of safe water to meet emergency needs 3-Parts of system w/o water 4-Contaminated water available for fire fighting, sanitary purposes 5-No water available | 53% |
| OCWA | Size of Service Area 1 - < 2,500 customers 2 - 2,500 - 5,000 3 - 5,000 - 10,000 4 - 10,000 - 25,000 5 - > 25,000 | 40% |



Risk –Likelihood of Occurrence

Scale (0 - 5)

0 - Will Never Occur

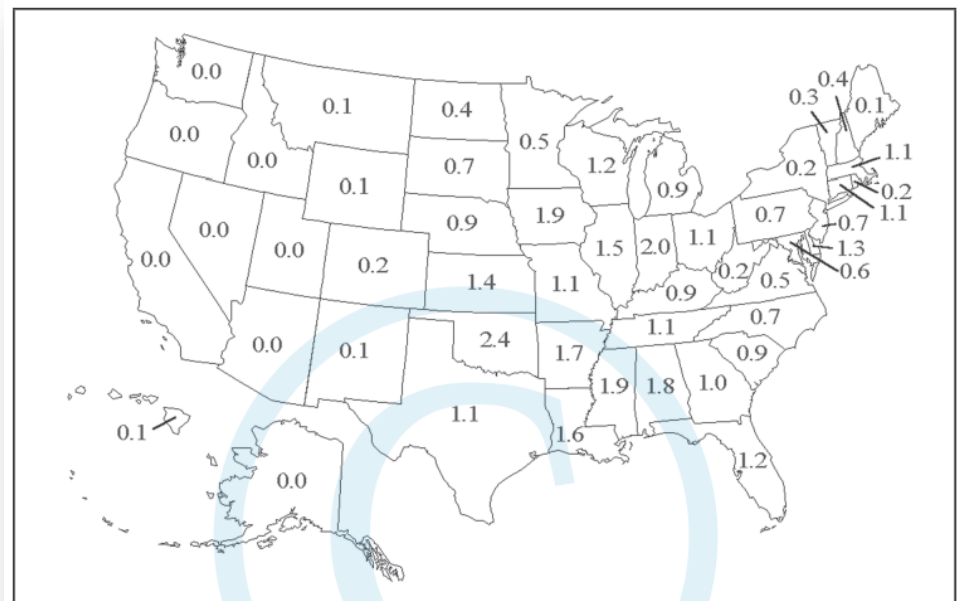
1 - every 100 years

2 - Every 25 Years

3 - Every 5 Years

4 - Every Year

5 - Multiple Occurrences Per Year



Source: <http://www.ncdc.noaa.gov/oa/climate/severeweather/tornadoes.html#maps>

Figure G-9 Average Annual Number of Strong-Violent Tornadoes (F2-F5) per 10,000 Square Miles by State, 1953-2004.



Organize and Confirm all Sites

| Location | Description | Last Countermeasure Assessment | Parent Location | Risk Scores Loaded | Last VAS Date |
|----------|---|--------------------------------|-----------------|--------------------|---------------|
| OCWA | Onondaga County Water Authority | | | N | |
| SITE005 | Belle Isle Pressure Reducing Valve | | | | |
| SITE010 | Breed Road Pressure Reducing Valve | | | | |
| SITE015 | Dunning Drive Pump Station Vault | | | | |
| SITE020 | Eight J (8J) Control Valve | | | | |
| SITE025 | Hidden Knolls Tank | | | | |
| SITE030 | Hinsdale PS, Fairmount Reservoir / Service Center | | | | |
| SITE040 | Howlett Hill Pump Station | | | | |
| SITE045 | Kasson Road Pump Station Vault | | | | |
| SITE050 | Kasson Road Control Valve | | | | |
| SITE055 | Maple Dr Pressure Reducing Valve | | | | |
| SITE060 | Munro Road Pressure Reducing Valve | | | | |
| SITE065 | Rolling Hills Pump Station | | | | |
| SITE070 | Scenic Meadows Pump Station | | | | |
| SITE075 | Sherwood Pump Station | | | | |
| SITE080 | Warners Tank | | | | |
| SITE085 | Warners Pump Station | | | | |
| SITE090 | West Hill Tank | | | | |
| SITE095 | Brewerton Tank | | | | |
| SITE100 | Cicero Airport Control Valve | | | | |
| SITE105 | McKinley Road Control Valve | | | | |
| SITE110 | Pardee Road Control Valve | | | | |
| SITE115 | Route 11 (Mud Mill Cv) | | | | |
| SITE120 | Bear Road Control Valve | | | | |
| SITE125 | Buckley North Control Valve | | | | |
| SITE130 | Caughdenoy Road Control Valve | | | | |
| SITE135 | Clay Tank | | | | |
| SITE140 | Route 57 Control Valve | | | | |

Drilldown

Select to show children. Select to hide children. Select to return location / asset.

Locations Assets

Location: OCWA Onondaga County Water Authority

Status: OPERATING Site: OCWA1

Asset in Location: Multiple top-level assets at this location.

System LOCATION OCWASITE

Show All Systems Show Path to Top View Work Details

- OCWA:Onondaga County Water Authority
 - CSYR:City of Syracuse
 - TCAM:Town of Camillus
 - SITE005:Belle Isle Pressure Reducing Valve
 - SITE010:Breed Road Pressure Reducing Valve
 - CVPIT_1073:Control Valve Pit, Breed Road
 - SITE012:Camillus Blow-Off Pit
 - CVPIT_1085:Control Valve Pit, Camillus Blow-Off
 - SITE015:Dunning Drive Pump Station Vault
 - PST_7809:Dunning Drive Pump Station**
 - BE_7810:Emergency Electric, Dunning Dr P.S.
 - BHVAC_7811:Building HVAC, Dunning Dr P.S.
 - COMM_7812:Communications, Dunning Drive PS
 - INST_7813:Inst, Dunning Dr P.S.
 - PPNG_7814:Piping, Dunning Drive P.S.
 - SITE017:Eastview Tank (Camillus)
 - SITE020:Eight J (8J) Control Valve
 - SITE025:Hidden Knolls Tank
 - SITE027:Hidden Knolls Pump Station Vault
 - SITE030:Hinsdale PS, Fairmount Reservoir / Service Center

Cancel



Risk Data Loaded into Maximo

Facility Description:
MAXIMO ID:
Facility Main Mission:

Office Dam / 5 Structures Onsite Including Chemical Treatment

Threat Characterization

| | Consequence Analysis | | | | | | | Likelihood of Successful Occurrence | | | |
|---|----------------------|----------------|------------------------------|-------------------------|-----------------------|---------------------------|---|---|----------------------|---------|-------------------------------------|
| | 1% | 2% | 3% | 5% | 10% | 25% | 50% | | | | |
| | J300 | | | | | | | CoF | | | |
| | Fatalities | Serious Injury | Financial Losses to the DOWA | Economic Loss to Region | Environmental Impacts | Loss of Public Confidence | Inhibiting National Defense or Government | Primarily based on redundancy around site | Size of Service Area | (3 - 5) | Likelihood of Successful Occurrence |
| Natural Hazard Reference Threat Scenarios | | | | | | | | | | | |
| Hurricanes (2 weeks without power) | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 1 | 5 | 2.61 | 3.0 |
| Snow Storms (30 days) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 3.0 |
| Ice Storm (no power for 2 weeks) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 3.0 |
| Tornadoes (1 week without power) | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 1 | 5 | 2.60 | 3.0 |
| Earthquakes (major damage to dam) | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 0.5 |
| Floods (1 week without facility) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 3.0 |
| Dependency and Proximity Hazard Reference Threat | | | | | | | | | | | |
| Utilities (no power for 2 weeks) | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 4.0 |
| Key Suppliers | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 3.0 |
| Key employees | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 1.0 |
| Key Customers | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 3.0 |
| Transportation | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 3.0 |
| Proximity | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 3.0 |
| Malicious Threats / Contamination | | | | | | | | | | | |
| Malicious Threats / Process Sabotage | | | | | | | | | | | |
| Physical—Insider (what the flow off, damage dam) | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1.0 |
| Physical—Outsider | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1.0 |
| Cyber - Inside | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 3.0 |
| Cyber - Outside | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 3.0 |
| Malicious Threats / Diversion or Theft | | | | | | | | | | | |
| Physical—Insider | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 3.0 |
| Physical—Outsider | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 3.0 |
| Cyber - Inside | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 3.0 |
| Cyber - Outside | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 5 | 2.60 | 3.0 |
| Malicious Threats / Marine Attack (boat) | | | | | | | | | | | |
| Physical—Insider | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1.0 |
| Malicious Threats / Air Attack (plane / drone) | | | | | | | | | | | |
| Physical—Insider | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1.0 |
| Malicious Threats / Land (vehicle) | | | | | | | | | | | |
| Physical—Insider | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1.0 |
| Malicious Threats / Assault Team | | | | | | | | | | | |
| Physical—Insider | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 3 | 5 | 3.86 | 1.0 |

175 Sites x 25 Threats =
4,375 Threat-Asset Pairs
Each Asset Pair – 15 Parameters

