



Wrestling with Storm Tides, Again: How to Host a Mock Storm Drill

Kate Roosa, E.I.T. and Frank Cavaleri, Area Manager

Agenda

- Background and Introduction
- Storm Drill Components
- Lessons Learned
- Best Practices
- Tools and Resources



Background: Hull Wastewater Treatment Plant



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Key Assets	Location	Elevation	Capacity
Front Door	Ground Level	+ 12.5	-
Activated Sludge Process	Ground Storage	- 6.0 to - 20.0	~7.8 MGD
Electrical Equipment	Basement	- 20.0	750 kW
Influent Pumps	Sub-Basement	- 40.0	~12 MGD
Effluent Pumps	Sub-Basement	- 40.0	~9 MGD

Introduction: Storm Experience



Event	Date	Precipitation (inches)	Storm Tide (feet)
Blizzard of 1978	February 1978	24 + (Snow)	15.0'
No Name "Perfect" Storm	October 1991	3.61 (Rain)	14.2'
Winter Storm Nemo	February 2013	24+ (Snow)	13.9'

Introduction

- Comprehensive Storm Event Planning
 - Emergency Response Committee
- High Flow Management Plan
- Last major event was 2013



Storm Drill: Steps to Success

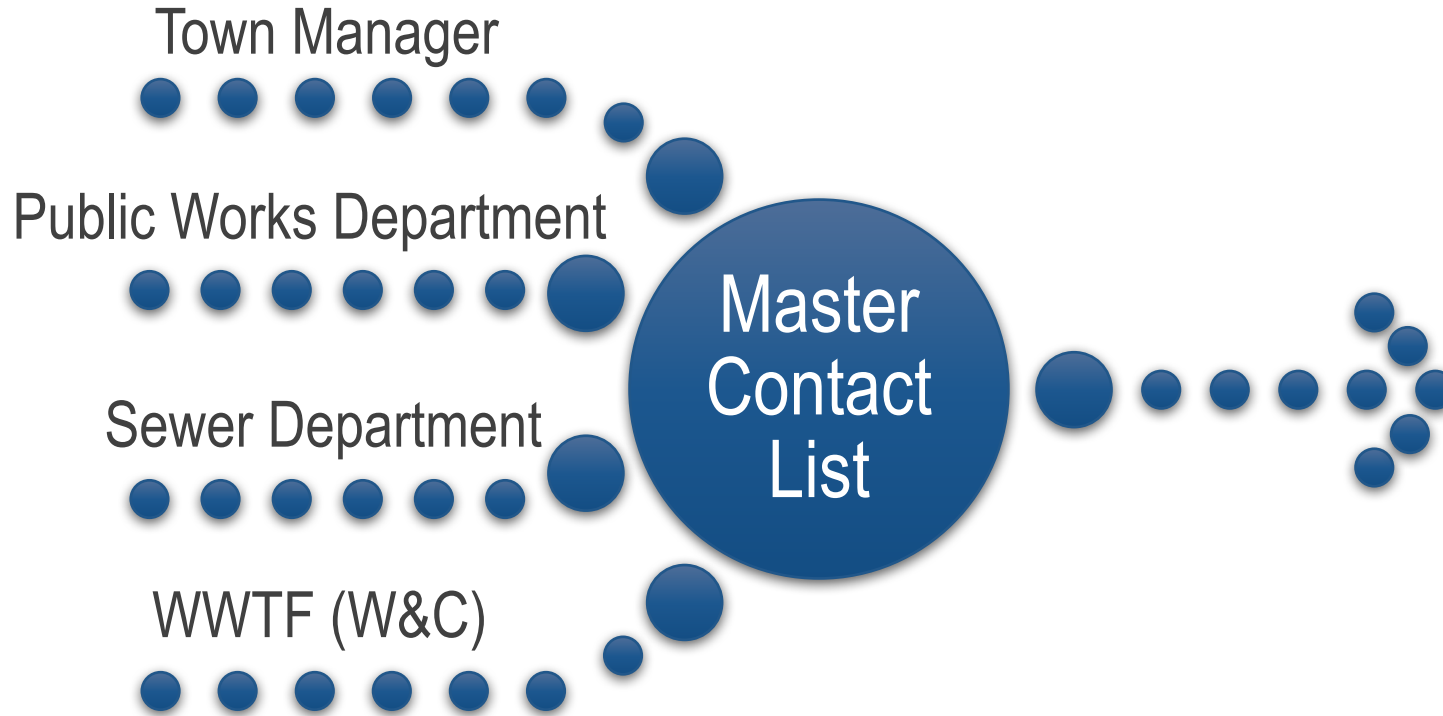
- Bring Together Key Stakeholders
- Forecast the Worst Case Scenario
- All Plans are Drafts until they're Tested

Scenario: Category 5 Hurricane

- Hurricane with tornadoes, severe storms and coastal and inland flooding



Bring Together Key Stakeholders

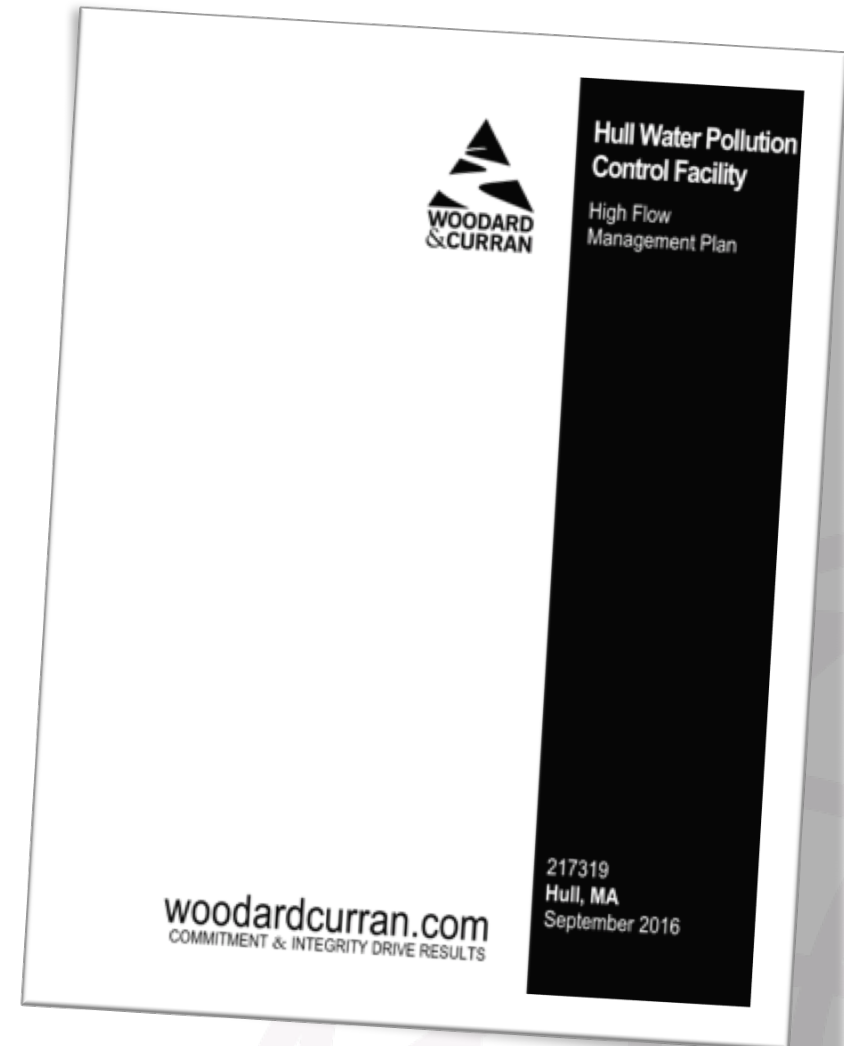


TOWN OF HULL WWTP EMERGENCY CONTACT LIST

CONTACT	DEPARTMENT	TITLE	OFFICE	CELL	HOME
MAIN OFFICE					
JOE STIGLIANI	DPW OFFICE	PHONE LINE	(781) 925 0900	N/A	(781) 925 0900
JIM DDW	DPW	DIRECTOR	(781) 740 8310		(781) 740 8310
CHRIS GARDNER	DPW	ASS'T DIRECTOR	(781) 740 8310	(781) 748 2518	
MARY ELLEN WHITE	DPW	FOREMAN	(781) 740 8310	(781) 206 1885	
ON CALL PERSON	DPW	OFFICE ADMIN	(781) 925 0711	(617) 733 0106	(781) 925 0711
JOYCE SULLIVAN	DPW		(781) 630 0110	(617) 872 5575	(781) 630 0110
BOARD OF HEALTH					
PETER LOMBARDO	BUILDING DEPARTMENT		(781) 925 2224		
ANNE HERBST	CONSERVATION		(781) 925 1330		
KURT BORNHEIM	HARBOR MASTER		(781) 925 8102		
DICK MILLER	HULL LIGHT		(781) 925 0316		
PAT CANNON	WIRING INSPECTOR		(781) 925 0051	(339) 236 1160	
EMERGENCY CONTACTS					
HULL POLICE	Town of Hull		(781) 925 1330	(339) 788 1104	
HULL FIRE	DISPATCH				
EMERGENCY MANAGEMENT	DISPATCH				
REPORTING AGENCIES					
MASS DEP	SOUTHEAST REGION		(781) 925 1212		
EPA	BOSTON	DAVE BURNS	(508) 946 2738		
MARINE FISHERIES		DAVID TURIN	(617) 918 1598		
TOWN ENGINEERS					
TIGHE & BOND		DEVON WINKLER	978-282-0308 X 169		
KLEINFELDER		MIKE SCHRADER	(508) 564 7285	(978) 761 6380	
KLEINFELDER		JOHN STRUZZIERI	(617) 498 4685	(617) 833 0374	(781) 925 3715
KLEINFELDER		MIKE CUNNINGHAM	(617) 497 7800	(617) 498 4773	
WASTEWATER TREATMENT					
OFFICE	WOODARD & CURRAN				
OFFICE	WWTP	CONTACT	Line #1	OFFICE	FAX
	WWTP		Line #2	(781) 238 2518	(781) 925 3054
				777777	N/A

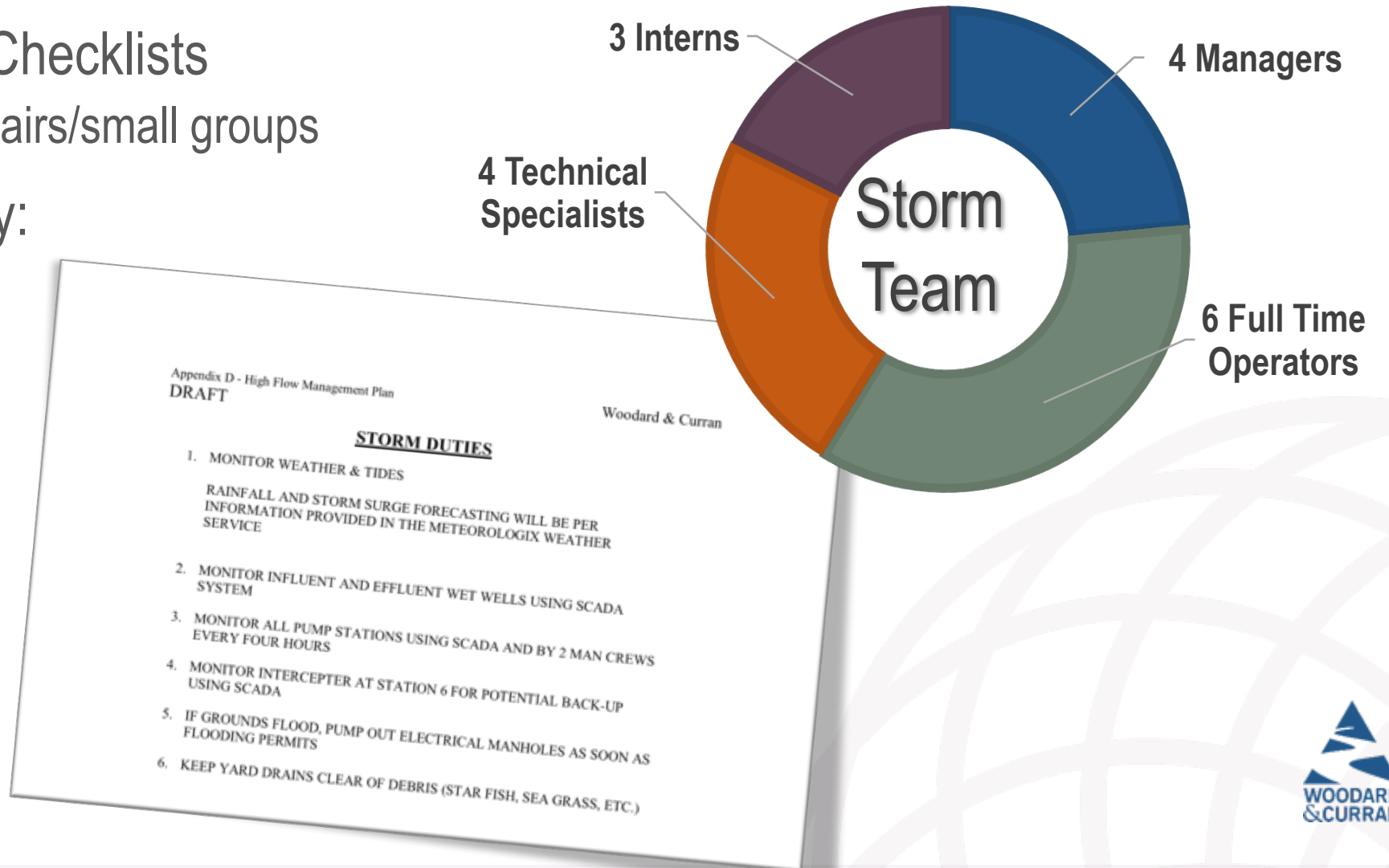
Forecast Worst Possible Event

- Level 1
 - Basic high flow event
 - @ 3.05 MGD sustained flow => switch to contact stabilization mode
- Level 2
 - Rainfall >3 inches per 24 hours and storm surge > 13 ft – Nor'easter
 - Flows greater than plant peak design flow
- **Level 3**
 - ***Catastrophic full or partial plant failure***

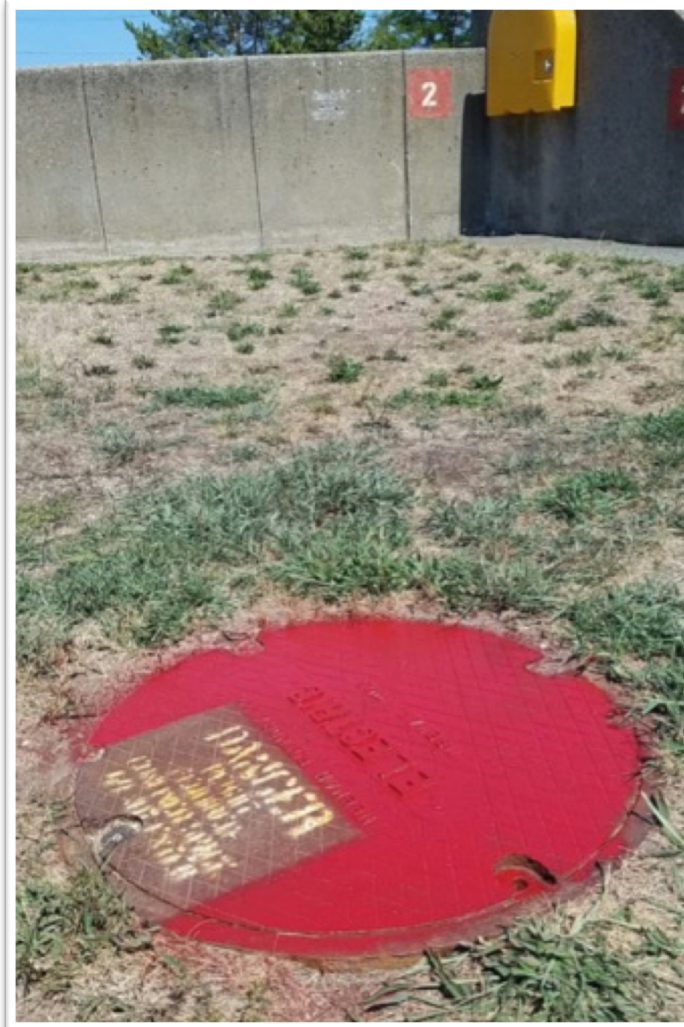


Put Plans to the Test!

- Run Through Checklists
 - Assigned in pairs/small groups
- Categorized by:
 - Pre-Storm
 - During Storm
 - Storm Level



Lessons Learned: Identifying Critical Field Elements



Lessons Learned: Securing Facilities



Lessons Learned: Bulk Chemical Storage Security



Best Practice: Quick Checklists

- Create quick, easy to follow checklists
- Take photos of process
- Maintain clean storage spaces
 - Time saved cleaning is time spent preparing!

The screenshot shows a document from Woodard & Curran for the Town of Hull Water Pollution Control Facility. The document is titled "Securing the Sodium Bisulfite Shed". It includes a table with the following information:

Standard Operating Procedures	Original – Created 08/29/16
Securing the Sodium Bisulfite shed in the event of an anticipated level 2 storm (expected flooding)	Revision #:
Town of Hull Water Pollution Control Facility	Revision Date:
	Pages: 4

The document also includes an objective section:

- OBJECTIVE
 - In the event of an anticipated Level (2) storm where flooding may be expected there needs to be standard operating procedures in place so that the Sodium Bisulfite Shed can be properly shut down and secured.

A photograph of a grey metal shed with a double door is shown. The shed is situated outdoors, and several blue barrels are visible in the foreground.

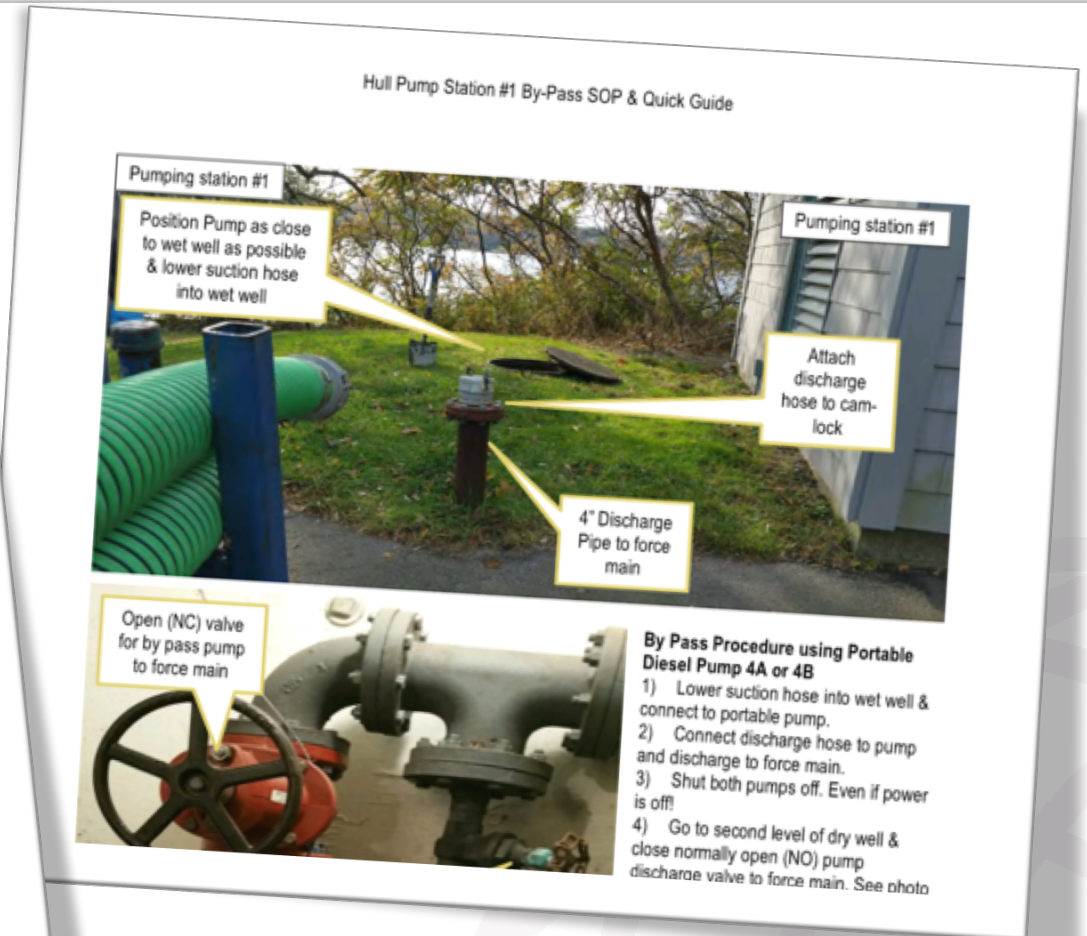
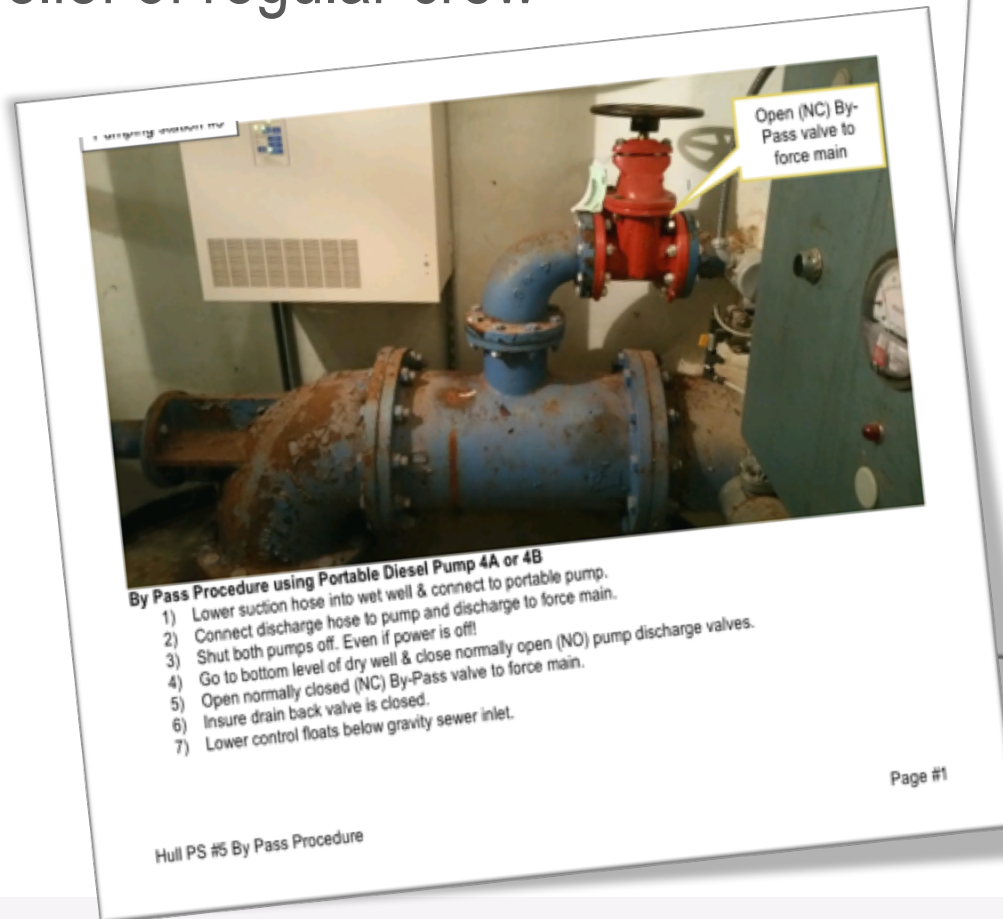
The document also includes a section titled "Sequence of Events":

- Create a storage area in the garage where everything can fit and be safely stored during the storm

A small photograph of a garage interior is shown below the text.

Best Practices: Easy to Follow Guides

- Frequent checking means relief of regular crew



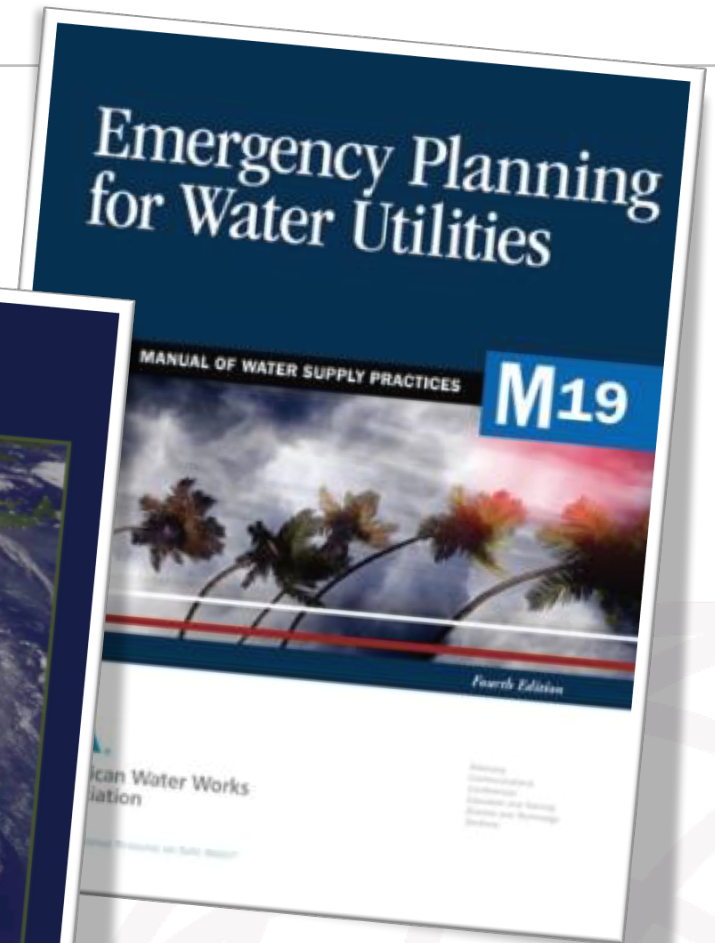
Conclusions

- Advanced planning is key
- Get your team involved in the process
- Practice, practice, practice!
- Small changes can make big impacts in an emergency event



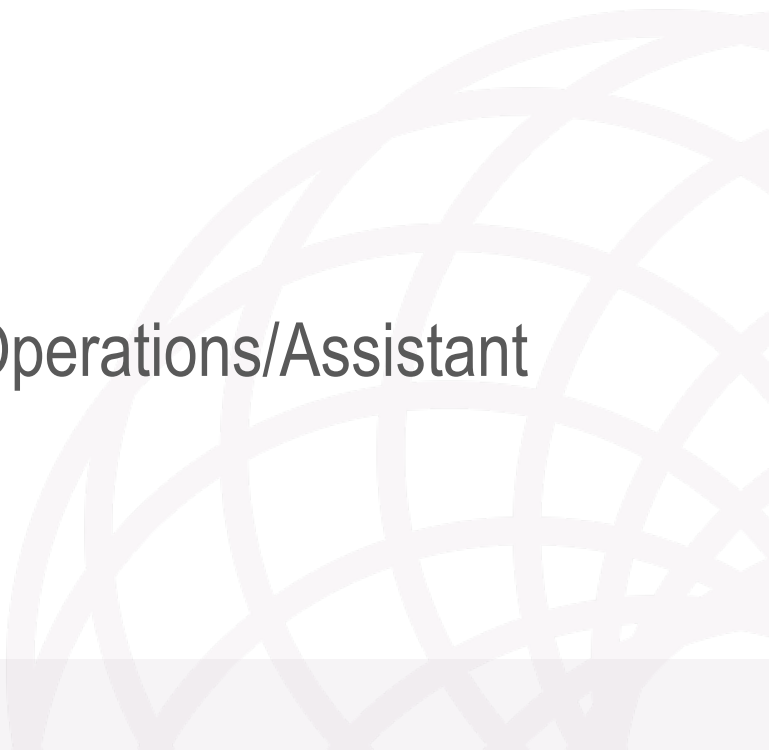
Tools & Resources

- AWWA M19
- NEIWPC
- Massachusetts WARN
- CodeRED





Acknowledgements

- Aram Varjabedian, Bill Boornazian and WWTF Team
 - Jim Gagliard and Jody St. George, Operations Experts
 - UConn Reclamation Plant Team
 - Phil Leminis, Town of Hull Manager
 - Jim Dow, Director of Public Works
 - John Struzziery, Director of Wastewater Operations/Assistant Director of Public Works
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Thank you!

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