



Emergency Preparedness:

How Ready for the Worst is Your Utility?

by Teri Liberator and Bill Elliott

No one likes to think about the possibility of a disastrous event occurring within one's own jurisdiction. But events such as earthquakes, floods, drought, volcanic eruptions, fires, hurricanes, war, major power outages, transmission facility failures, dam failures and other disasters occur daily. Our area is not immune; it is just that our number has not come up recently. As an example, research has revealed that in the past, Oregon has experienced sudden large earthquakes (30-900 times the magnitude of that in 1989 in San Francisco) of long duration known as *subduction zone* earthquakes. Evidence indicates that the interval of these subduction 'quakes is 300-500 years; radioactive dating indicates it has been about 350 years since Oregon's last one.

This is not meant to be a *gloom and doom* discussion to leave you shaking in your boots. It is to help focus on the importance of emergency preparedness planning.

Most of us probably have been spared the painful and terrifying experience of coping with disaster of this magnitude. But good emergency planning can help your utility prepare for any emergency from a main break to an earthquake. With ever shrinking funding and resources, planning often takes a back seat to more pressing operational problems. But lack of planning for disaster or planning in hindsight can lead to unnecessary injury, loss of life and property, more costly repairs, and a slow and uncoordinated response effort (which, at the very least, can result in embarrassment for your utility, even in a minor crisis).

This article was written to provide a framework with which to begin emergency response planning or to assist in updating a plan that may be on a shelf collecting dust. The self-evaluation and plan content checklists below are designed to help determine whether your emergency plan needs to be updated or expanded. They are designed to stimulate your thinking and not intended to be complete.

Teri Liberator is an engineer with the municipal utilities group of CH2M Hill, Seattle. Bill Elliott is a water utility engineer for the Portland Water Bureau involved in emergency and long-range planning.

Utility self-evaluation		Yes	No
1. Does your utility have an emergency response plan?		<input type="checkbox"/>	<input type="checkbox"/>
2. Has it been updated in the last year?		<input type="checkbox"/>	<input type="checkbox"/>
3. Have you used the plan?		<input type="checkbox"/>	<input type="checkbox"/>
4. Do you have periodic exercises of your plan?		<input type="checkbox"/>	<input type="checkbox"/>
5. Does your agency work with a larger emergency organization?		<input type="checkbox"/>	<input type="checkbox"/>
6. Do you have an emergency operating center?		<input type="checkbox"/>	<input type="checkbox"/>
7. Do you have a public relations program for your identified hazards situations?		<input type="checkbox"/>	<input type="checkbox"/>
8. Do you have cooperative agreements with your neighbors?		<input type="checkbox"/>	<input type="checkbox"/>
9. Do you have backup or standby power for critical facilities?		<input type="checkbox"/>	<input type="checkbox"/>
10. Do you have mutual aid agreements with: other water utilities; public works or county groups, private companies?		<input type="checkbox"/>	<input type="checkbox"/>
11. Do you have any idea how you would supply water should your source be disrupted?		<input type="checkbox"/>	<input type="checkbox"/>
12. How would you react to a sabotage or extortion threat?			
Plan content checklist			
Source of supply	<input type="checkbox"/> secure?	<input type="checkbox"/> vulnerable?	
Treatment	<input type="checkbox"/> power?	<input type="checkbox"/> people	<input type="checkbox"/> spare parts
	<input type="checkbox"/> chemicals	<input type="checkbox"/> chlorine	
Transmission	<input type="checkbox"/> long lines	<input type="checkbox"/> slides	<input type="checkbox"/> earthquakes
	<input type="checkbox"/> collapse	<input type="checkbox"/> bridges	
Power supply	<input type="checkbox"/> auxiliary	<input type="checkbox"/> two sources	
	<input type="checkbox"/> weather	<input type="checkbox"/> history of problems	
Pumping	<input type="checkbox"/> power	<input type="checkbox"/> spare parts	<input type="checkbox"/> control
	<input type="checkbox"/> telemetry	<input type="checkbox"/> response	
Storage	<input type="checkbox"/> safe	<input type="checkbox"/> earthquake	<input type="checkbox"/> control

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<i>Distribution</i>	<input type="checkbox"/> telemetry	<input type="checkbox"/> adequate
	<input type="checkbox"/> people	<input type="checkbox"/> main breaks
	<input type="checkbox"/> valving	<input type="checkbox"/> repair
		<input type="checkbox"/> parts
<i>Continued on page 2</i>		
Plan Content Checklist (Continued from page 1)		
<i>Personnel</i>	<input type="checkbox"/> skills types	<input type="checkbox"/> back-up
	<input type="checkbox"/> training	<input type="checkbox"/> mutual aid
<i>Materials and Supplies</i>	<input type="checkbox"/> off hours vendors	<input type="checkbox"/> phones
	<input type="checkbox"/> ham operators	<input type="checkbox"/> officials
	<input type="checkbox"/> base and portable	<input type="checkbox"/> batteries
	<input type="checkbox"/> radios	<input type="checkbox"/> television

- Emergency plans*
- management commitment
 - basic plan
 - call up
 - exercises
 - response
 - help
 - State
 - Federal

Once you've determined that you need to prepare a plan or revise an existing one, there are six basic steps:

Hazard Analysis

This is a list of potential disasters that could occur in your area, ranking the severity of each on your operation. An example list is below. Possible secondary effects should also be listed. For example, if the event is an earthquake, secondary disasters might be dam rupture, conduit failure, structural failure of buildings or storage tanks, disruption of transportation facilities to key sites or fires. It is the secondary disasters that you likely will be responding to directly.

Some of the hazards that could create a disastrous situation in Portland:

- a. Natural environmental hazards
 1. Drought or extended dry spell resulting in water/power shortage
 2. Earthquake
 3. Flood
 4. Ice storm
 5. Landslide
 6. Snow / blizzard
 7. Tornado or wind storm
 8. Volcanic eruption
- b. Accident emergencies
 1. Collapse of building structures, bridges or dams
 2. Explosion (industrial, gas line, sewer, chemical, etc.)
 3. Fire (multiple buildings, industrial, forest, grass)
 4. Release of toxic gas or hazardous materials through industrial or transportation accident
 5. Transportation accidents
 - Airplane crash
 - Train wreck
 - Motor vehicle (auto, bus, truck) wreck
 - Marine (ship, barge) collision
 6. Utilities transmission failures
 - High tension electric transmission lines

- Water mains
- Gas mains

- c. Medical emergencies
 1. Mass poisoning
 2. Extreme smog conditions
 3. Epidemic
 4. Pollution of water supply
- d. Deliberate human action
 1. Civil disturbance or riot
 2. Nuclear holocaust
 3. Terrorism or sabotage - bomb
- e. Peacetime nuclear emergencies
 1. Accidental missile launch
 2. Nuclear reactor accident
 3. Accident involving transportation of nuclear materials

Capability Assessment

Once you have identified possible disasters and related crises, you need to assess how well your utility is equipped to respond. In this step, inventory all equipment which might be used, assess its condition and list its location. Include warning and communications systems, construction equipment, vehicles, emergency supplies, back up systems, etc. Weaknesses and possible methods of improving them should be identified. Research of available resources outside your utility (other agencies, private organizations) should be conducted and included. Any unique or unusual needs should be addressed.

Emergency Operating Plans

When you have completed a list of needs (hazard assessment) and resources (capability assessment) you will be ready to begin structuring your implementation strategy for responding to emergency situations. The emergency operating plan(s) will include a communications network and responsible parties for making each contact, which may be different for each type of emergency.

Include a plan for communication with the public which explains the impact of the emergency on daily life (the need for conservation, temporary use of bottled water, trucking of water to the area by the utility, etc.) Consider various media options to communicate your message and try to make the delivery mode commensurate with the degree of hazard or risk. Television may be best if the risk and number of persons affected are high as in source contamination but a letter to customers may suffice if the situation affects only a few persons and the risk is relatively low, such as a local main break.

This portion of the plan should include current information regarding the availability of public assistance and appropriate contacts. Include mobilization procedures and chain of command (who will be responsible for

Operator Certification Notes

The Operator Certification Program has contracted with the American Boards of Certification (ABC) and utilized ABC exams for its October test. Of the 135 who took the exam, 85% passed. In exit interviews, examinees said they thought the tests were fair. Different exams will be provided each time (next test will be in May) and they will be updated continually to reflect changes

in technology and regulations.



In 1989, the Oregon Legislature excluded community water systems having 15 but fewer than 150 connections served by a groundwater source from Operator Certification requirements.

Operators of these systems however, are still required to obtain continuing

education units (CEUs). One CEU is to be reported by July 1, 1992, and two CEUs must be reported by July 1 every two years thereafter. We are considering a policy that would allow systems to pool credit for training where several users of the system might get training that collectively equals two CEUs.

Initial VOC Monitoring Period Ends

The deadline has passed for those public water systems required to do the initial monitoring for volatile organic chemicals (VOCs). Community and nontransient noncommunity systems with a population of 25 to 199 were to begin monitoring between Jan. 1 and Dec. 31, 1991. Of the 1,000 systems this regulation affects, 90% have complied. If your system has not submitted a sample for testing, please contact your lab immediately. Notices of violation for non-compliance with the Oregon drinking water regulations will be issued in early 1992 to those systems which have not completed the test.

Beginning in 1993, Phase II regulations require *all* community and nontransient noncommunity public water systems to test quarterly for VOCs. The rule allows systems to grandfather in results of tests for unregulated VOCs done under Phase I. If your system has not completed the test for unregulated contaminants, this would be an excellent way to save money later. When grandfathered data is used in the initial Phase II monitoring round, only one VOC test may be required instead of the four quarterly tests. Testing for unregulated VOCs now can be money well spent.

PIPELINE is published quarterly by the staff of the Oregon Health Division, Drinking Water Section. It is intended to provide useful information on technology, training, and regulatory and policy issues to those involved with the state's public water systems to improve the quality of drinking water in Oregon. **PIPELINE** may be copied or reproduced without permission provided credit is given.

Please send requests for article topics or manuscripts of your articles to John Gram, editor (503 / 229-6302).

This issues contributors include: Bill Elliott, Portland Water Bureau; Teri Liberator, CH2M Hill, Seattle; Mike Grimm, Ron Hall and Chris Hughes, all of Oregon Health Division.

Water Law Conference Offered

An educational conference on Oregon water law will be held at the Red Lion Inn - Columbia River, Portland, Feb. 20-21. Designed for lawyers, landowners, developers, government officials and water managers, the conference will examine such topics as Oregon water law's legal and institutional structure; water marketing and transfer; environmental concerns, including endangered species considerations; and groundwater legislation.

The conference is sponsored by CLE International of Seattle; additional information can be obtained from Elfi Rice at 206 / 567-4490.

RCAP Guidebooks Available

The Rural Community Assistance Program (RCAP) has published some excellent booklets for small water systems. They are:

- Small System Guide to the Safe Drinking Water Act;
- Small System Guide to Developing and Setting Water Rates;
- Small System Guide to Financial Management.

The booklets are available free of charge from RCAP by calling (703) 771-8636.

Plastic Pipe Recalled

The National Sanitation Foundation has recalled some PVC potable water pipe because it may not comply with the maximum permissible level of 2.0 ppm of residual vinyl chloride monomer in NSF standard 14:

Size	Manufacturer	Production dates
2", 3", 4"	TBA, Inc. Rt. 2, Box 1766 Alpine AL 35014	Oct. 25 - Dec. 4, 1990
All sizes	Hawk Plastics Corp. 14055 Plant Road Alpine AL 35014	Oct. 25 - Dec. 4, 1990

For further information, contact Jim Paschal, NSF-Plastics Program Manager at 313 / 769-8010.

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assuring the successful completion of each type of response activity), who directs the overall effort within your organization, levels of decisions and who needs to be involved in each. In the event a preferred option is unavailable during an emergency, be prepared with effective alternatives. Include after hours telephone numbers for suppliers of materials which may be needed.

The plan should also include a menu of alternative scenarios to fit various levels of disaster, such as how to provide service to one section of town if a mainline to that section breaks or how to furnish water should your main supply become contaminated. The more detail and thought that you put into the plan's preparation, the better equipped your utility will be to respond. Include flexibility in decision making and authority or the plan may inhibit quick response to a crisis.

Capability Maintenance

All emergency preparedness plans need regular updates and the capability you assessed must be maintained. This means a scheduled revision of the plan to ensure that personnel/position designations for response activities are current, the names and phone numbers for the communications network are accurate, equipment is serviced and the inventory and locations are verified and updated. Personnel need to be trained, including periodic rehearsal of emergency responses to fictitious disasters. This is the true test of the plan and revisions to improve it can be based on knowledge gained from trying it out.

Mitigation Efforts

Now that you have prepared for the worst, you need to expend more effort to ensure that it never happens to you. Of course, you only have so much control over natural disasters. What we suggest is that resources need to be directed to minimize the effects of hazards and the risk of loss and suffering. These efforts may involve capital expenditures over several years to reduce vulnerability.

An example of mitigation measures might be risk assessment of your major system components' ability to withstand earthquakes and then construction of recommended risk reduction improvements. Others are changes in construction methods for pipeline design and/or installation which reduce the risk of major main breaks; accelerating main replacement; installation of equipment for remote monitoring of system operations during a crisis; and installation of an alternate communications network (radio, cable) that can be used in the event of phone

system failure.

Operations During an Emergency

The true test of your planning efforts will be an emergency. As soon as operations return to normal following any crisis in which the plan is used, a debriefing session should be held to analyze the successes and shortcomings of response efforts. Use this to identify future mitigation efforts, revisions to emergency operations or new equipment that should be obtained to more successfully respond. List all capability shortfalls so they can be addressed effectively. Fine tune your communications network and decision-making assignments.

We hope this article provides a framework in which to develop or revise your emergency plan. Assistance with emergency preparedness planning is available through the state Emergency Management Division, Portland Office of Emergency Management, your county's emergency management agency, Federal Emergency Management Agency, Washington Environmental Training Center, Linn-Benton Community College and the American Water Works Association. Good luck and let's hope your emergency plan is a skillfully crafted tool that will never be tested.

Oregon's Emergency Response System

by Ronald Hall, R.S.

ORS 401 requires every county to designate an emergency response coordinator and to develop emergency response plans for foreseeable emergencies. Their efforts are coordinated at the state level by the Emergency Management Division (EMD, 378-2911). You can call them or your county commissioners to find the name of your county's emergency response coordinator. EMD has developed master plans for the specific types of foreseeable emergencies listed in the accompanying article. These are state plans and act as supplements to local plans. Water suppliers should coordinate their site specific plans with local fire and police and the county emergency planning coordinator.

Emergency planning is a local responsibility. State agencies have a backup role when the response capacity of local government is exceeded. Their resources can be tapped by calling the Oregon Emergency Response System (OERS) 1-800-452-0311. State agencies have provided EMD with a list of criteria to use to determine whether or not they should be called. Thus the OERS network allows a local responder to call *one* number to generate responses from the appropriate state agencies.

The most common type of calls received by the Health Division are related to spills into waterways. Anytime

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there is a spill into a waterway that serves as a downstream source of drinking water, Health Division staff attempt to notify the system to shut down the intake until any potential danger passes. We consider this a redundancy in the notification system, i.e., ideally, the system operators would have already been notified by the local emergency network. Let's consider a couple of real life situations.

An Oregon municipality has an intake on a river just downstream from a freeway bridge. One of the water department staff realized that if a vehicle carrying hazardous materials were to go off the bridge into the river, the materials could be in the intake within 15 minutes. Recognizing the danger this presented to 30,000 customers, the water department sponsored a series of meetings involving fire, law enforcement, highway, maintenance and dispatch personnel and others. The department's goal was to ensure it would be notified of any spill immediately so it could react to protect the safety of the water supply. This is an excellent example of a hazard analysis and proactive planning.

In another recent example, a fire at a farm chemical storage facility late at night on a weekend was put out by a local fire department. During the cleanup, residuals were washed into the river that ran by the back of the parking lot. No one was aware that the water intake for a city of 5,000 was just downstream. When someone noticed what was happening, the water system was shut down. The Division was called to determine whether or not the water was safe. Obviously, we had no way of making that determination. Had the system done a better job of planning for such a foreseeable emergency, it might have known that a larger nearby municipal system had a mobile van with on board laboratory capability that could run a check for contaminants.

While natural disasters occur, incidents associated with hazardous materials are far more frequent. Surface water systems are the most vulnerable to contamination and should have current and useful emergency response

plans in place. Making sure that your local emergency responders (usually police and fire) are aware of the vulnerable aspects of your system is especially important in assuring a speedy and appropriate response.

Hazardous materials response teams have recently been trained, equipped and deployed around the state under the general direction of the State Fire Marshall's office. These teams are highly trained and specially equipped to deal with hazardous materials emergencies. Water systems should be aware of which team services their area and have a general idea of its capabilities. Your local fire chief or the State Fire Marshall's Office (378-5210) can put you in touch with your regional team.

Mutual aid agreements are an extremely valuable planning tool. If you have equipment or resources that might be useful to a neighboring water supplier, the Division encourages you to develop an inventory and protocols for accessing them. Submit the list to your county's Office of Emergency Management which can serve as a clearinghouse for water system resources. An added benefit is the higher visibility of public water supply concerns in the emergency management arena.

The State Emergency Management Office for New York has developed an MS-DOS software package for emergency planning for public water supplies called "Resource." Health Division has a copy of the software; you can request a disk from OHD for \$10 which covers the disk, copying and mailing. The address is: Oregon Health Division (461), Box 231, Portland OR 97207.

TAG Workshops Planned

The Division's Technical Advisory Group (TAG) is beginning the development of Emergency Response workshops to be offered around the state in 1992. Notice will be provided in the **PIPELINE** once they are scheduled.

SWTR Implementation Progresses

Implementation of the Surface Water Treatment Rule (SWTR) is in full swing. Oregon Health Division anticipates three community public water supplies will apply for an exception to filtration which is based on a system's ability to meet all criteria in the rule to remain unfiltered. Requests for an exception were due by December 20. The remainder of the 54 community and 115

noncommunity unfiltered systems using surface water will receive an Administrative Order (AO) which includes a compliance schedule with deadlines by which filtration must be installed or the system must switch to an alternate source. These AOs should arrive by mid-January. OHD plans workshops during the first week of April for systems currently

operating filtration systems and those looking to install filtration to meet the SWTR deadlines. One of the main topics of the workshop will be how OHD will evaluate treatment plants' ability to meet SWTR requirements. Announcements of workshop times and locations were mailed in December. For more information about the workshops or SWTR implementation, call Mike Grimm at 229-6307.

Training Calendar

Small Water System Training courses

Drinking Water Section, OHD
 Contact Claudia Stiff, 229-6307
Date County / other location
 Feb Coos/Curry
 Mar Jackson/Josephine
 April Multnomah/Clackamas/
 Washington
 May Wasco/Sherman/Hood River
 June Deschutes/Crook/Jefferson

July Douglas/Lane
 Aug Lincoln
 Sept Pendleton/Klamath Falls
 Oct Polk/Yamhill
 Nov Tillamook/Clatsop/Columbia

Phase II Workshops

1/21 10am-4pm Blue Mountain
 Community College,
 Pendleton

1/22 1-5pm Beaverton
 Tualatin Valley Water
 District offices
 1/27 1-5pm Public Works building,
 Bend
 1/29 9am-1pm Medford
 1/29 10am-1pm Eugene Water and
 Electric Board offices

Health Division Will Move to New State Office Building

Health Division and several other state agencies will move to the new State Office Building nearing completion near Lloyd Center in Portland. The new address will be 800 NE Oregon St., Portland 97232. The moving dates are tentatively Feb. 14-17. New office and telephone numbers will be listed in the next *PIPELINE*.

Staff Notes

Mike Grimm was promoted to Regional Supervising Engineer replacing **John Straughan** who left to join the Department of Environmental Quality's Pendleton office.

Claudia Stiff took over as office specialist in the Field Services unit after **Jo Ann Collins** resigned.

Robin Peterson transferred from the Office of Epidemiology and Health Statistics, replacing Stiff as Office Assistant in the Monitoring and Compliance unit.

Pam Judd replaced **Vicki King**, office specialist in Monitoring and Compliance unit, who resigned to have a baby (a girl, **Jordan Marie**, 6 lbs. 4 oz., born Dec. 10). Judd previously worked in the Office of Epidemiology and Health Statistics.

Drinking Water Section Thanks:

Bill Keser of The Dalles for his efforts as a member of the Technical Advisory Group;

Ron Cross, city of La Grande, and **Hal Haight**, Gleneden Beach Water District for their work with the Operator Certification program's advisory committee.

David E. Leland, Manager 503 / 229-6302