

Homeland Security Exercise and Evaluation Program

Region 6

Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

August 2008



PREFACE

The purpose of publishing an After Action Report (AAR) and Improvement Plan (IP) is to aid exercise planners evaluating the effectiveness of an exercise, document major accomplishments, and areas for improvement. Specifically, this AAR/IP of the Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise (Sound Shake '08) was produced in collaboration with the City of Seattle, the City of Bellevue, Snohomish County, King County, and the State of Washington.

This AAR/IP is tangible evidence of the public safety partnership in response to a catastrophic incident. Exercises are the culmination of training toward a collective level of preparedness. Documentation including After Action Reports provide a key mechanism for continuously improving collective readiness.

ADMINISTRATIVE HANDLING INSTRUCTIONS

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3. Exercise Director Point of Contact:
Grant Tietje
City of Seattle, Office of Emergency Management
105 5th Avenue South, Seattle, WA 98104
206-684-7722
Grant.Tietje@Seattle.Gov
4. Exercise Plans Section Chief
Heather Kelly
King County, Office of Emergency Management
3511 NE 2nd Street, Renton, WA 98056
206-205-4034
Heather.kelly@metrokc.gov
5. Exercise Evaluator Team
Bob Takemura
MLC & Associates, Inc.
253-857-3124
Bob.takemura@mlcandassociates.com
www.mlcandassociates.com

TABLE OF CONTENTS

<i>Subject</i>	<i>Page</i>
PREFACE	I
ADMINISTRATIVE HANDLING INSTRUCTIONS	II
EXECUTIVE SUMMARY	1
PURPOSE.....	1
BACKGROUND	2
SCOPE OF PLAY.....	2
<i>Assumptions</i>	2
<i>Artificialities</i>	3
OBJECTIVES	3
EXERCISE OVERVIEW	5
GENERAL INFORMATION	5
<i>Scenario Tools</i>	6
EXERCISE PLANNING TEAM	6
EXERCISE ROLES AND PARTICIPANTS	7
<i>Roles</i>	7
<i>Participating Organizations</i>	8
MESSAGE FLOW	10
EXERCISE SYNOPSIS	11
MISSION OUTCOMES BY OBJECTIVE	13

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

<i>Communications</i>	14
<i>Emergency Management Interface</i>	15
<i>Impact Reporting and Analysis</i>	15
<i>Public Information Dissemination</i>	16
<i>Resource Allocation</i>	16
EXERCISE EVALUATOR RATINGS	17
<i>Overall Evaluation</i>	17
PARTICIPANT FEEDBACK RATINGS	20
CRITICAL TASK PERFORMANCE	22
OVERALL RESULTS	27
POSITIVE OUTCOMES	27
LESSONS LEARNED	28
<i>Communications</i>	28
<i>Training</i>	31
<i>Planning</i>	32
<i>Operations</i>	33
<i>WebEOC</i>	36
ACTION ITEMS (IMPROVEMENT PLAN)	38
<i>Communications</i>	38
<i>Training</i>	41
<i>Planning</i>	42
<i>Operations</i>	43
<i>WebEOC</i>	45
CONCLUSION	47

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

APPENDICES.....	48
APPENDIX 1 – LIST OF PRIMARY EXERCISE PARTICIPANTS AND ROLES.....	48
APPENDIX 2 – SOUND SHAKE 2008 NEWS RELEASE AND TALKING POINTS	51
APPENDIX 3 – REGIONAL IMPACT MASTER SCENARIO EVENTS LIST (MSEL)	53
APPENDIX 4 – RPIN MESSAGES	57
APPENDIX 5 –EXERCISE EVALUATION FORM.....	59
APPENDIX 6 – HAZUS MAP SAMPLES.....	61
APPENDIX 7 –EVALUATIONS BY LOCATION.....	65
<i>King County ECC, Policy Room, and KC Government JIC.....</i>	<i>66</i>
<i>Snohomish County EOC.....</i>	<i>68</i>
<i>City of Bellevue EOC</i>	<i>69</i>
<i>City of Seattle EOC.....</i>	<i>70</i>
<i>State of Washington EOC.....</i>	<i>71</i>
INDEX.....	74

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

Figures

Figure 1: Exercise Controller Organization 10

Figure 2: Sound Shake '08 Catastrophic Earthquake Functional Exercise Average Evaluation Ratings by Category 18

Figure 3: Participant Feedback Rating - People 20

Figure 4: Participant Feedback Rating - Participation..... 20

Figure 5: Participant Feedback Rating - Technology..... 21

Figure 6: Participant Feedback Rating – Realism 21

Figure 7: Participant Feedback Rating - Structure and Organization..... 21

Figure 8: HAZUS Utility Damage Projection 62

Figure 9: HAZUS Building Inspection Need Projection..... 63

Figure 10: HAZUS Hospital Availability Projection 64

Figure 11: KC ECC, Policy Room, and KC JIC Evaluator Ratings 67

Figure 12: Snohomish County Evaluator Rating 68

Figure 13: City of Bellevue Evaluator Rating..... 69

Figure 14: City of Seattle Evaluator Rating 70

Figure 15: Washington State Evaluator Rating 71

EXECUTIVE SUMMARY

Purpose

The Department of Homeland Security's (DHS) Urban Areas Security Initiative (UASI) supports local contingency planning efforts in order to mitigate the impact of terrorist attacks. The Seattle UASI and Regional Partners Sound Shake '08 Catastrophic Earthquake Exercise Series supports this initiative by improving the overall response capabilities needed after any disastrous incident (i.e., terrorist act or natural disaster). Specifically, the purpose of Sound Shake '08 was to provide the Seattle UASI Region (including the City of Seattle, City of Bellevue, Snohomish County, King County, the State of Washington, other participating counties and cities and participating business partners) with the opportunity to implement and test regional catastrophic incident planning efforts. The exercise evaluated and provided a platform for additional training on coordination, interoperability, the use of contingency plans, technology (e.g., WebEOC), communication (800 MHz radios, RACES, and satellite telephones), decision-making, and response immediately following a catastrophic earthquake.

The exercise was conducted on March 5, 2008 from 0750 until approximately 1600 when the Exercise Director announced the end of the exercise (ENDEX). Hot wash evaluations were conducted by each participating UASI partner following the exercise. An open forum Regional hot wash was conducted on March 7, 2008 at the Washington State Criminal Justice Training Center.

This After Action Report/Improvement Plan (AAR/IP) provides a summary of the Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise. In addition, this AAR/IP documents major accomplishments and opportunities for improvement.

Background

The Seattle UASI and Regional Partners recognize their responsibility to protect the public from the impacts of disasters, and to prepare for, respond to, recover from, and mitigate against the hazards associated with a catastrophic regional incident. This includes the necessity for a properly integrated response. With this responsibility in mind, the Seattle UASI and Regional Partners developed Sound Shake '08 to test the policies, plans, procedures, equipment, and training implemented to respond to a regional incident.

Sound Shake '08 was an exercise series consisting of seminars, workshops, trainings, and tabletop exercises building up to the March 5, 2008 Functional Exercise. The Functional Exercise included the City of Seattle, the City of Bellevue, Snohomish County, King County, and the State of Washington as well as other participating jurisdictions and regional partners.

Scope of Play

The scope of play for the Sound Shake '08 Functional Exercise required the activation of Emergency Operations Centers at each participating UASI partner in response to a catastrophic Seattle Fault earthquake. These actions included all aspects of emergency management to support local, regional, State, and Federal responders. Emergency management activities for the Sound Shake '08 Functional Exercise were fed through local and master exercise control simulation cells (Sim Cells).

Assumptions

The following general assumptions applied to the Sound Shake '08 Functional Exercise:

- Emergency personnel who respond to incident scenarios were to operate in accordance with existing plans, procedures, and practices during this exercise.
- The goals and objectives of the exercise were to be consistent with functional area operations and technical plans and procedures, whenever possible, as long as safety, cost effectiveness, and prudence are not compromised.

Artificialities

The following artificialities detracted from realism; however, exercise planners and participants accepted these artificialities in order to facilitate accomplishment of the exercise objectives. Surrogates sometimes played in place of some key decision makers. The surrogates, in most instances, were junior to the principals they represented. Thus, the surrogates' actions during the exercise may not have depicted the same actions that might be taken by their respective principals. The Sound Shake '08 Functional Exercise was played in real time. Some events, however, were accelerated to meet exercise objectives. Examples included recovery of infrastructure systems such as telecommunications, the Internet, and electrical power. Additionally private sector issues were injected by participating business partners and through the use of simulation scripts.

Objectives

The following Sound Shake '08 exercise objectives were selected by the exercise planning team and vetted by the Emergency Management Director of each participating UASI partner:

1. Communications

Evaluate the ability of regional communication capabilities to facilitate interoperable communication links throughout the region during response to a catastrophic earthquake.

- 800 MHz system capacity challenge
- WebEOC interoperability
- Test satellite based communication systems
- Verify accuracy of communication contact numbers
- Establish radio patches per the Tactical Interoperable Communications Plan (TICP)

2. Emergency Management Interface

Evaluate the ability of multiple EOC/ECC's to coordinate information, planning and response efforts during a catastrophic earthquake.

- Challenge reporting systems by injected failures
- Evaluate the ability to achieve and maintain accurate timely situational awareness

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

- Test redundant systems for information transfer
- Evaluate the ability to meet establishing deadlines for briefings, media releases, documentation, as directed by plans

3. Public Information Dissemination

Evaluate the ability of the Joint Information System (JIS) to rapidly and effectively disseminate public information and warnings in support of real time operations to the community.

- Test ability to reach diverse/special needs populations
- Evaluate the ability to partner with media to support information dissemination
- Effectively gather and produce consistent regional messaging

4. Impact Reporting and Analysis

Test existing and regional plans for damage reporting and analysis and evaluate the ability to coordinate and disseminate information to key stakeholders.

- Test plans for information gathering ability
- Test the ability to analyze information and integrate information into operational plans
- Coordinate a regional impact assessment

5. Resource Allocation

Evaluate the ability of emergency management to prioritize and allocate resources utilizing current capabilities following a catastrophic earthquake.

- Test the ability of emergency management to regionally prioritize and allocate resources
- Test the ability of emergency management at a local level to prioritize and allocate resources
- Evaluate the ability to identify and procure resources from outside of the impacted area

EXERCISE OVERVIEW

General Information

The primary scenario for this exercise was a 6.7 magnitude earthquake on the Seattle Fault at 0754 on March 5, 2008. The full Seattle Fault Scenario document can be referenced at <http://seattlescenario.eeri.org>. Variables were used for the development of the scenario and the overall structuring of the Sound Shake '08 Functional Exercise. The following variables were selected by exercise planners to be included in the exercise scenario:

- The potential for multiple cascading incidents
- The potential for the presence of hazardous materials (HazMat) incidents
- The potential for mass casualties and injuries

Exercise Name	Sound Shake '08 Functional Exercise
Type of Exercise	Functional Exercise
Exercise Date	March 5, 2008
Sponsor	Dept of Homeland Security and WA State Seattle UASI
Program	DHS funding through WA State / Seattle UASI
Recipient	City of Seattle
Mission	Protect and Respond to a Catastrophic Earthquake
Classification	By Invite Only (IO)
Capabilities	Leadership decision communication, Teleconferencing, Video conferencing, WebEOC documentation and status reporting, Emergency Notification System, the Emergency Coordination Center (ECC) /Emergency Operations Center (EOC) operational procedures using Incident Command System, multi-jurisdictions including coordination, communication, and interoperability plans.
Scenario	Catastrophic Earthquake – Seattle Fault Scenario 6.7 Magnitude Earthquake
Location	Geographical areas of the City of Bellevue, City of Seattle, King County, and Snohomish County. In addition, the Washington State EOC provided participation and support.

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

Scenario Tools

Scenario tools were used to initiate and stimulate the exercise play and inject scenario events. These included a Master Scenario Events List (MSEL) that outlined benchmarks or actions anticipated during the exercise. Part of the MSEL included scripted messages, known as injects, for introduction into exercise play.

The MSEL was developed to ensure continuous play during stated exercise hours. If a sufficient level of exercise intensity could not be maintained as a result of actual play or injects, controllers were allowed to stimulate additional player responses to achieve exercise objectives in coordination with the Exercise Director and Senior Controller.

<i>Exercise Planning Team</i>	
City of Seattle Emergency Management	Grant Tietje, Exercise Director
King County Office of Emergency Management	Heather Kelly, Plans Section Chief
City of Bellevue Emergency Management	Vernon Owens
Snohomish County Emergency Management	Carrie Akerstrom
State of Washington Emergency Management Division	Lit Dudley, Jerry Jenson, and Stephen Simerly
First Aid Approach	Dave Tait, Exercise Design Support
MLC & Associates, Inc. (Consultants)	Bob Takemura

Exercise Roles and Participants

Roles

The following roles were defined for the exercise:

Players	Players were agency personnel who had an active role in responding to such an emergency by performing their regular roles and responsibilities during exercise play. Players initiated actions that controlled and responded to the simulated emergency.
Controllers	Controllers were exercise participants who planned and managed exercise play; setup and operated the exercise incident site; and acted in the roles of response individuals and agencies not actually playing in the exercise. Controllers provided key data to players and prompted or initiated certain player actions to ensure exercise continuity. <i>Controllers are the only participants who provided information or direction to the players.</i> All controllers were accountable to the senior controllers.
Evaluators	Evaluators were chosen from various agencies, regional partners, and independent third parties to evaluate and comment on designated functional areas of the exercise. Evaluators are chosen based on their expertise in the functional area(s) they reviewed during the exercise. Evaluators had a passive role in the exercise and only noted the actions of players; they did not interfere with the flow of the exercise.
Observers	Observers viewed all or selected portions of exercise play. Observers did not participate in exercise play or in exercise control functions. Observers were designated by each partner respective to their EOC, if desired.

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

Participating Organizations

Federal	
US Coast Guard – Sector Seattle	IBRD Project
US Dept of Health and Human Services	DHS - FEMA
Environmental Protection Agency (EPA)	
International Observers	
Canadian Consulate – Seattle	Provincial Emergency Management British Columbia
Canadian National Exercise Division	Capital Regional District
Emergency Management City of Vancouver, BC	Emergency Management City of Richmond, BC
State of Washington	
Elected Officials	Governor Gregoire’s Executive Cabinet
University of Washington	Emergency Management Division
Regional	
Puget Sound Energy	Community Transit
Boeing	Port of Seattle
American Red Cross	Region 6 Health Care Coalition
PNSN – Pacific NW Seismology Network	KIRO News Radio
NOAA – Seattle Weather	BELO (King 5)
City of Seattle	
All City Departments	Washington Mutual
Seattle Steam	Safeco Insurance
Seattle City Light	Pemco Insurance
Amgen, Inc.	Seattle Community Colleges
PCCS, Inc.	Seattle University
City of Bellevue	
All City Departments	Symetra Financial
T-Mobile	Unigard Insurance
Bentall Capital, (US Inc.)	

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

King County	
All King County Government Divisions	King County Separately Elected Offices
City of Woodinville	City of Renton
City of Kent	City of Des Moines
City of Auburn	City of Normandy Park
City of Shoreline	City of Burien
City of Redmond	City of SeaTac
City of Kirkland	Vashon Be Prepared
City of Covington	City of Issaquah
City of Mercer Island	KC FD #27
KC FD #13	KC FD #44
King County Library System	Eastside Fire and Rescue
Northshore Utility District	City of Bothell
Woodinville Fire and Life Safety	Sammamish Plateau Water and Sewer
Snoqualmie Indian Tribe	
Snohomish County	
Snohomish County Emergency Management	City of Arlington
City of Monroe	Valley General Hospital
City of Goldbar	Disability Resource Center
Sultan School District #311	Marysville Police Dept.
Snohomish County Government Departments	Volunteers of America North Sound
HAM Radio Groups	
Participating EOC Radio Teams	KC FD #40 Radio Team
ESFR Radio Team	U of W Radio Team
Vashon Island Radio Team	Medical Services Team
Boeing Radio Team	WaMU Radio Team
PSE – Amateur Radio Team	City of Renton Radio Team
Others	
City of Tacoma Fire – Emergency Management	City of Tacoma Police
Washington State HLS Region 3	

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

Message Flow

Messages were provided via telephone, cellular telephones, 800 MHz radio, amateur radio, satellite telephone, ViPR teleconference calls, and/or E-mail. Initial messages were generated by message Sim Cells at each participating location. Secondary messages flows were generated by the participants during the exercise. In addition, an Exercise Master Control Cell functioned with overall coordination responsibilities and reported directly to the Exercise Director.

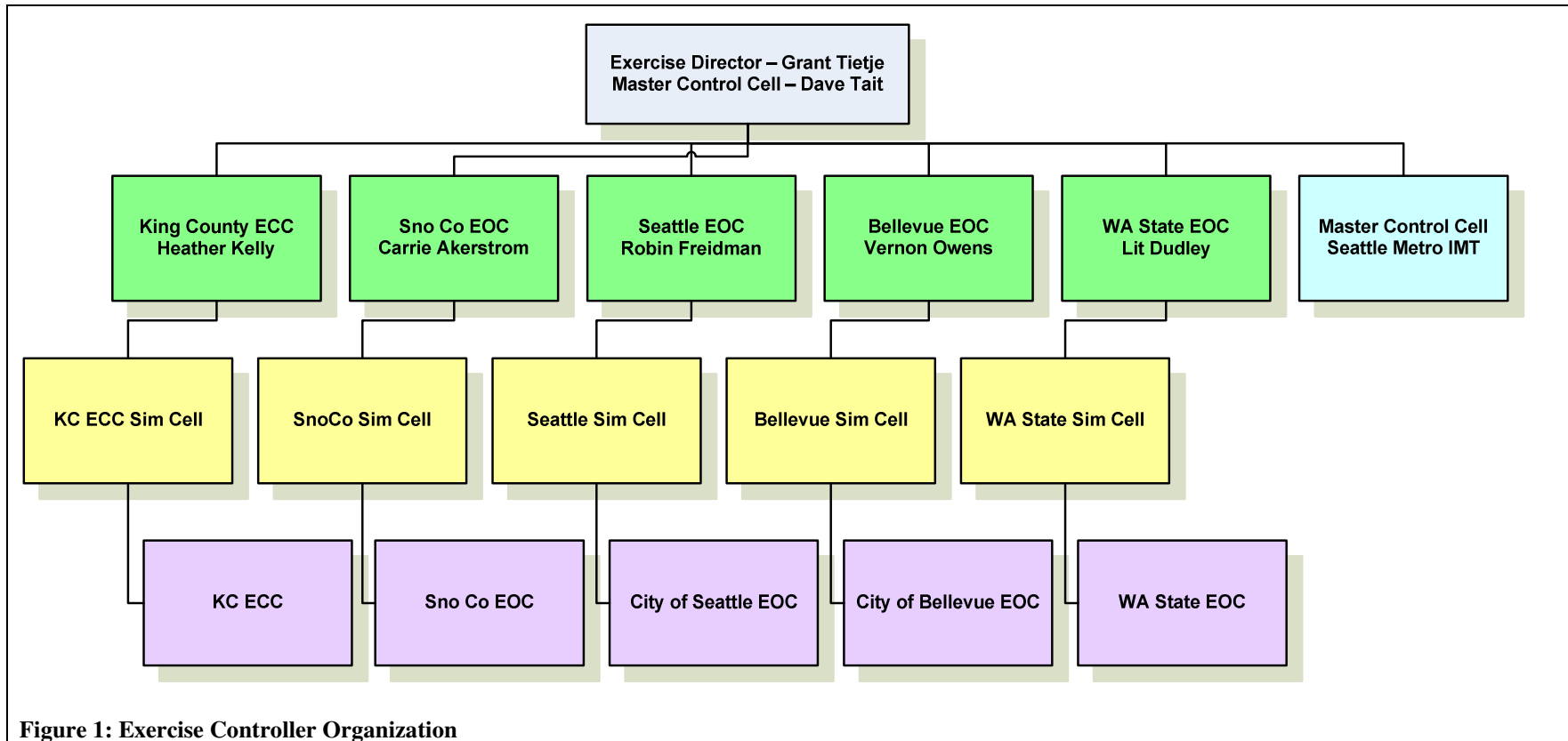


Figure 1: Exercise Controller Organization

Exercise Synopsis

The primary scenario for this exercise is a 6.7 magnitude earthquake on the Seattle Fault at 0754 on March 5, 2008. The full Seattle Fault Scenario document can be referenced at <http://seattlescenario.eeri.org>. Primary impacts included major damage to regional transportation systems, loss of critical infrastructure systems (power, phone, water, fuel) major damage to facilities causing injuries and fatalities. The following summary appears in the Scenario for a Magnitude 6.7 Earthquake on the Seattle Fault¹, which formed the basis for Sound Shake '08.

A major earthquake on the Seattle Fault will have a significant impact on the communities of the Central Puget Sound region. The magnitude 6.7 scenario earthquake and its aftermath will disrupt for weeks and months individuals, families, businesses and governments throughout the region. The disruption will be much, much greater than the February 2001 magnitude 6.8 Nisqually earthquake. Collapsed buildings or falling debris will kill or injure thousands of people, and trap hundreds of others. Hospitals closest to the fault may be unable to provide care to the injured because of damage to their facilities. Damage to the transportation system will impede emergency responders, prevent many commuters from returning home, and impede traffic and commerce for months. Shelter space for people made homeless because of the quake will be limited in the immediate area because of damage to schools and community centers. Water for drinking and firefighting will be scarce because of pipeline breaks. Power and natural gas service will be out, and telephone and radio communications will be difficult for days. Untreated wastewater will pollute soils and waterways near sewer line breaks. Losses will be similar in magnitude to those of the 1994 M6.7 Northridge earthquake in California, at \$40 billion, the nation's most costly natural disaster to date.

¹ Earthquake Engineering Research Institute and the Washington Military Department Emergency Management Division, *Scenario for a Magnitude 6.7 Earthquake on the Seattle Fault*, June 2005

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

Scenario earthquake losses included:

<i>Loss Category</i>	<i>Estimated Losses</i>
<i>Property Damage and Economic Loss</i>	<i>About \$33 billion</i>
<i>Deaths</i>	<i>More than 1,600</i>
<i>Injuries</i>	<i>More than 24,000</i>
<i>Buildings Destroyed</i>	<i>About 9,700</i>
<i>Buildings Severely Damaged and Unsafe to Occupy</i>	<i>More than 29,000</i>
<i>Buildings Moderately Damaged Whose Use is Restricted</i>	<i>About 154,500</i>
<i>Fires</i>	<i>About 130, causing nearly a half billion dollars in property damage</i>

The economic impact of the scenario earthquake on the region and the State of Washington primarily depends upon how quickly the heavily damaged transportation system is placed back into service.

Scripted events included:

- The initial loss of normal communications and utilities
- Critical facility damage
- Critical infrastructure damage
- Public housing issues including the need for temporary shelter

Full details of events are provided in the Appendices– Master Scenario Events Log (MSEL)

Mission Outcomes by Objective

The exercise allowed city, county and state leaders the opportunity to process through the impacts and decisions that will occur immediately following a catastrophic regional earthquake. The Sound Shake '08 exercise objectives were selected by the exercise planning team and vetted by the Emergency Management Director of each participating UASI partner. Five major categories of evaluation were defined:

Communications	Evaluate the ability of regional communication capabilities to facilitate interoperable communication links though out the region during response to a catastrophic earthquake.
Emergency Management Interface	Evaluate the ability of multiple EOC/ECC's to coordinate information, planning and response efforts during a catastrophic earthquake.
Impact Reporting and Analysis	Test existing and regional plans for damage reporting and analysis and evaluate the ability to coordinate and disseminate information to key stakeholders.
Public Information Dissemination	Evaluate the ability of the Joint Information System to rapidly and effectively disseminate public information and warnings in support of real time operations to the community.
Resource Allocation	Evaluate the ability for emergency management to prioritize and allocate resources utilizing current capabilities following a catastrophic earthquake.

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

The tables below provide a summary of the accomplishments met for each category. In general, accomplishments describe positive outcomes of the exercise although (where applicable) notes regarding improvement areas are provided. Detailed analyses of specific issues are provided in the *Critical Task Performance* section and areas for improvement are documented in the *Lessons Learned* section of this report.

Communications

Communications Area of Evaluation	Accomplishments
Verify accuracy of communication contact numbers	Key contact numbers were verified in individual operations plans at all levels, (cities, counties, and state).
800 MHz system capacity challenge	The 800 MHz system functioned well and was used extensively throughout the exercise.
Test satellite based communication systems	Some satellite telephone capabilities were tested, with mixed results.
Establish radio patches per TICP ²	Not accomplished. See <i>Critical Task Performance and Lessons Learned</i> sections for details.
WebEOC interoperability	WebEOC was used as a communications tool and information repository by individual groups however interoperability remains an issue. See <i>Critical Task Performance and Lessons Learned</i> sections for details.

In addition, the incorporation of various communities into the exercise provided a basis for testing communication and coordination between multiple jurisdictions. This was especially important for smaller cities.

² Tactical Interoperable Communications Plan (TICP) per Homeland Security Presidential Directive-5, *Management of Domestic Incidents* and the DHS *National Incident Management System (NIMS)*.

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

Emergency Management Interface

Emergency Management Interface Area of Evaluation	Accomplishments
Evaluate the ability to meet established deadlines for briefings, media releases, documentation, as directed by plans	Press releases were issued by County, State, and local Public Information Officers (PIO's). Furthermore, simulated media briefings were conducted.
Challenge report systems by injected failures	The exercise began with the loss of local utilities and standard communications. This forced the use of emergency reporting systems such as WebEOC and RPIN.
Test redundant systems for information transfer	WebEOC was a major source of information for the exercise. Other methods implemented during the exercise included the 800 MHz radio, Radio Amateur Civil Emergency Service (RACES) including E-mail over radio, satellite telephones, the ViPR video conferencing system, and the Regional Public Information Network (RPIN).
Evaluate the ability to achieve and maintain accurate timely situational awareness	Local situational awareness was partially met however regional situational awareness was not fully achieved.

Impact Reporting and Analysis

Impact Reporting Area of Evaluation	Accomplishments
Coordinate a regional impact assessment	Local impact assessments occurred and some coordination of the regional impact of the incident took place between the cities, counties, and state. Communications occurred at several levels mainly through E-mails, conference calls, and telephone conversations. However, a complete regional impact assessment was not fully coordinated.
Test ability to analyze information and integrate information into operational plans	Information analysis was performed locally and was used to inform local leadership so that operational plans could be formulated (though issues remain regarding intra EOC/ECC coordination as well as coordination between the different EOC/ECC's at the city, county, and state levels).
Test plans for information gathering ability	Local information gathering occurred via planned routes, mainly through the 800 MHz radio system and RACES during the initial stages of the exercise and later via telephone calls, conference calls, E-mails, and WebEOC.

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

Public Information Dissemination

Public Information Dissemination Area of Evaluation	Accomplishments
Evaluate the ability to partner with media to support information dissemination	Two simulated news conferences occurred with actual media partners from local news stations.
Test ability to reach diverse/special needs populations	Consideration of local diverse/special needs populations did occur at the individual city, county, and state level. However, a coordinated response did not occur and additional planning is needed to pre-establish checklists for all diverse/special needs population considerations.
Effectively gather and produce consistent regional messaging	The ability to produce consistent regional messaging was less than satisfactory and additional work in this area is needed. See <i>Critical Task Performance and Lessons Learned</i> sections for details.

Resource Allocation

Resource Allocation Area of Evaluation	Accomplishments
Test the ability of emergency management at a local level to prioritize and allocate resources	The “cold start” at the beginning of the exercise was a challenge. Minimal resources were available and this caused problems for local emergency management. While initially slow, the allocation of resources eventually improved.
Test the ability of emergency management to regionally prioritize and allocate resources	Although the allocation of resources was addressed at the local level, regional coordination of resources can be improved. See <i>Critical Task Performance and Lessons Learned</i> sections for details. One area that did work well was the coordination of air support for search and rescue assistance.
Evaluate the ability to identify and procure resources from outside of the impacted area	Although some attempts to procure resources from outside the impacted area did occur, general performance in this area needs improvement. One reason may be that the exercise was limited to a finite set of players and an actual catastrophic incident would generate more calls for outside assistance. See <i>Critical Task Performance and Lessons Learned</i> sections for details.

Exercise Evaluator Ratings

Overall Evaluation

The following table provides a summary of the major exercise evaluation objectives by category for all participating jurisdictions.

Category	Objective
Communications	Evaluate the ability of regional communication capabilities to facilitate interoperable communication links though out the region during response to a catastrophic earthquake.
Emergency Management interface	Evaluate the ability of multiple EOC/ECC's to coordinate information, planning and response efforts during a catastrophic earthquake.
Public information dissemination	Evaluate the ability of the Joint Information System to rapidly and effectively disseminate public information and warnings in support of real time operations to the community.
Impact Reporting and Analysis	Evaluate the ability to report and analyze information.
Resource Allocation	Evaluate the ability for emergency management to prioritize and allocate resources utilizing current capabilities following a catastrophic earthquake.
Overall	Evaluate overall exercise effectiveness.

Positive statements regarding the effectiveness of each category were rated by the Exercise Evaluators according to a 1 to 5 scale: A 1 indicates non-effective and a 5 indicates completely effective.

A copy of the Exercise Evaluation Form statements/questions by category is provided in the Appendices of this AAR/IP.

Rating	Description
1	Strongly Disagree
2	Disagree
3	Somewhat Agree
4	Agree
5	Strongly Agree

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

The Exercise Evaluators rated overall performance as partially effective, i.e., the Evaluators “somewhat agreed” with the positive outcome statements/questions contained in the Exercise Evaluation Form. Detailed analyses of specific issues are provided in the *Critical Task Performance* section of this report.

Category	Rating
Communications	3.19
Emergency Management Interface	2.58
Impact Reporting and Analysis	2.50
Public information Dissemination	2.48
Resource Allocation	2.67
Overall	2.55

In general, all categories measured require development. However it is important to recognize that the major success of the exercise was that key areas for improvement were identified. Implementation of the action items documented in this AAR/IP will ensure that the Region will be better prepared to meet the challenges anticipated during and after a catastrophic incident.

Specific issues included:

- A lack of coordination and communication between the cities, counties, and state. Silos remain between cities and the counties as well as between the counties and the state.
- A need for better coordination and communication within EOC's/ECC's.
- A need for better understanding of roles and responsibilities.
- A need to inform all EOC/ECC members of which agencies/jurisdictions were present, what tasks they were assigned, and

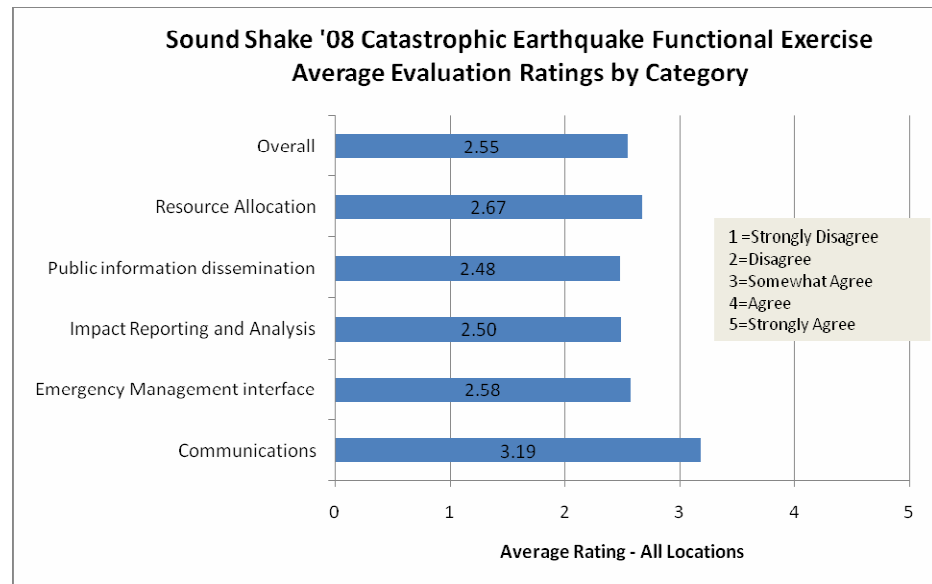


Figure 2: Sound Shake '08 Catastrophic Earthquake Functional Exercise Average Evaluation Ratings by Category

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

where they were located.

- WebEOC has not been fully utilized as a collaboration mechanism particularly between groups. Since separate instances of WebEOC have been implemented, there is no effective way to share data between the various city, county, and state EOC's.
- Training on WebEOC remains an issue despite the fact the scheduled training sessions are provided.
- WebEOC needs further improvement and customization.
- Instant Messaging capabilities are needed within WebEOC and/or ECC/EOC's to aid communications.
- In general there was a lack of forward thinking in terms of planning for the days and weeks following the incident as well as utilization of regional partners.
- The Joint Information System (JIS) was never implemented during the exercise. Instead individual jurisdictions managed PIO responsibilities separately with limited coordination.
- HAZUS damage projection maps were generated by the Washington State EOC but the maps were sent via E-mail and the last few characters of the file name were truncated. Consequently, there were problems with opening the files. This problem was identified and corrected later in the day.

Participant Feedback Ratings

The following figures provide participant evaluation ratings for five key questions:

Participant Feedback Question	Number of Responses	Average Rating
The participants included the right people in terms of level and mix of disciplines.	160	4.06
Participation in the exercise was appropriate for someone in my position.	167	4.31
The technology available in the EOC (such as WebEOC, ViPR, AV Systems) during the exercise enhanced operations	162	3.39
The exercise scenario was played out in a realistic manner.	164	3.86
The exercise was well structured and organized.	165	3.91

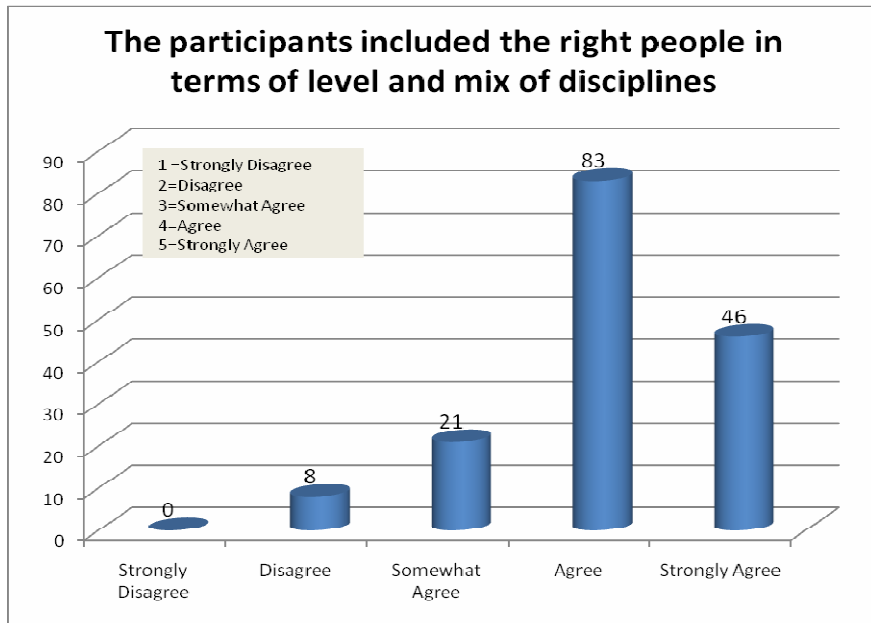


Figure 3: Participant Feedback Rating - People

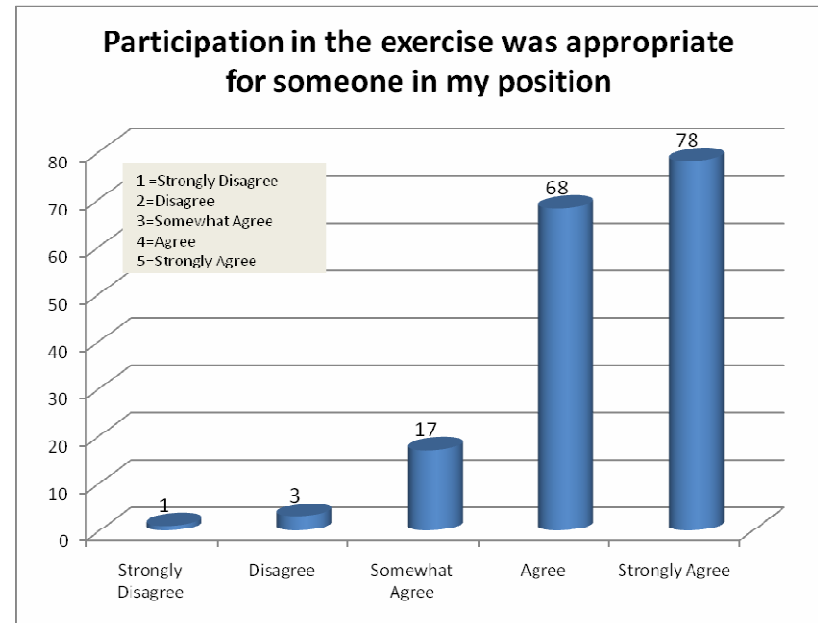


Figure 4: Participant Feedback Rating - Participation

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

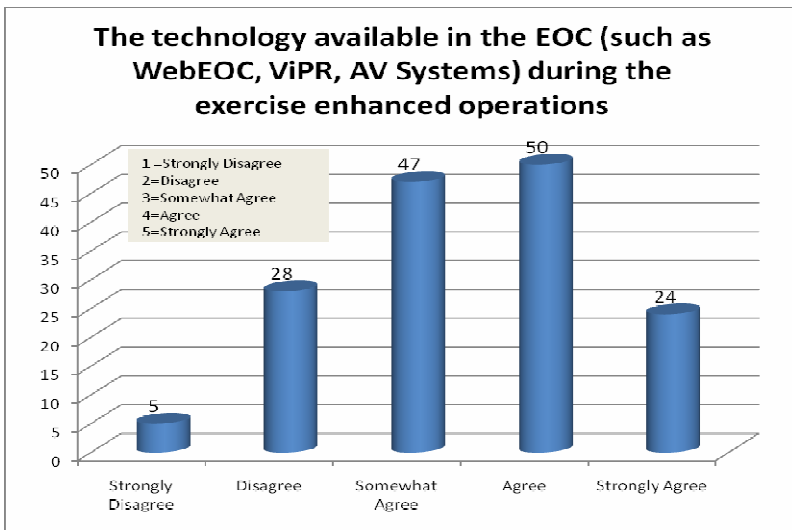


Figure 5: Participant Feedback Rating - Technology

In general participants felt that the correct people participated and the correct disciplines were represented in the exercise. Also most felt that the exercise was realistic and generally well structured.

The one area that was an issue was technology, where a number of participants felt that improvements were needed. In fact, although some participants rated technology highly (either a 4 or 5) nearly all felt that technology tools (particularly WebEOC) need improvement.

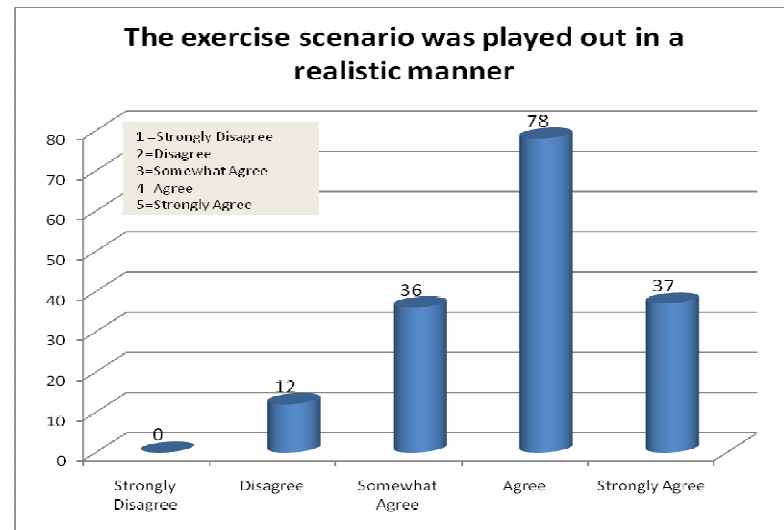


Figure 6: Participant Feedback Rating – Realism

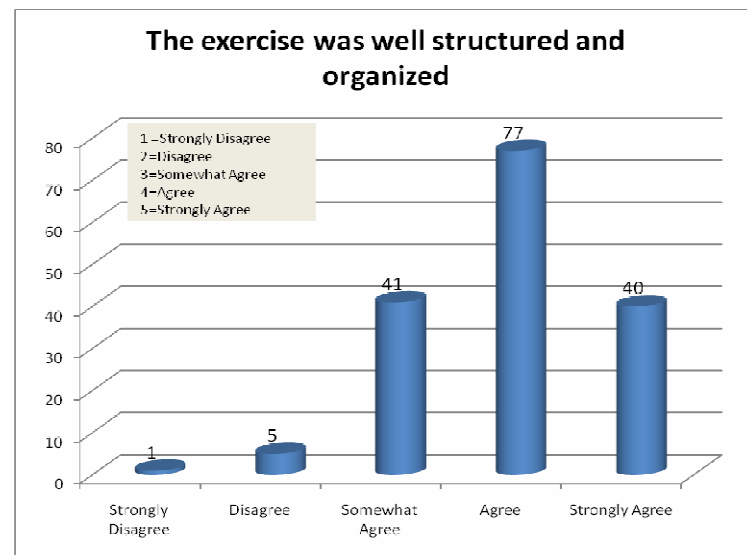


Figure 7: Participant Feedback Rating - Structure and Organization

Critical Task Performance

The major issues presented in the exercise focused on the interaction between the local jurisdictions, Counties, the State of Washington, and critical partners. A summary of major pre-determined tasks is provided below. In addition, the Regional Master Scenario Events Log (Regional MSEL - see Appendices) outlines specific actions and anticipated outcomes.

Task	Communication
Issue	Communication and coordination with local jurisdictions was a major objective of the exercise and established the framework for cooperation throughout the simulation.
Reference	Regional MSEL 08:00: All Sim Cells Phones out (landline and cell).
Summary of Issue	The 800 MHz radio system, RACES, and satellite telephones (where applicable) are key tools for maintaining communications in a regional incident. The 800 MHz radio system is a primary resource during an incident such as a catastrophic earthquake. RACES and satellite telephones are also critical. In particular the amateur radio (RACES) network provides a solid group of trained volunteers that are an invaluable resource in an emergency.
Consequences	An inability to communicate and coordinate with local jurisdictions can lead to duplication of effort, conflicting efforts, and the issuance of contradictory information to the public leading to confusion, a decrease in public trust, and negative media coverage.
Analysis	A Tactical Interoperable Communications Plan was not implemented. While the State provided general overall support, each City and County focused on their individual issues. Although some cross communication did occur, a formal TICP was never instituted.
Recommendations	Additional and continued practice is required to ensure fully coordinated responses.
Actions	It is recommended that additional coordination exercises be conducted and similar coordination activities be implemented whenever practical during actual incidents. Also, consider developing regional templates of initial communication channels, based on likely scenarios such as earthquake. This will speed the establishment of communication links during a disaster. Furthermore, review the practical implications of "home rule" and how mutual regional and state-wide communication can be improved.

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

Task	Emergency Management Interface
Issue	The ability to use available tools to share information and coordinate responses was a key objective of the exercise.
Reference	Regional Impact MSEL 07:54: All Sim Cells Earthquake / Phones out (landline and cell).
Summary of Issue	The use of WebEOC along with redundant communications methods during a catastrophic incident provides a basis for coordination between the cities, county, and state.
Consequences	An inability to use tools such as WebEOC to coordinate activities between local jurisdictions leads to the same problems as a lack of communication, i.e., duplication of effort, conflicting efforts, and the issuance of contradictory information to the public leading to confusion, a decrease in public trust, and negative media coverage.
Analysis	While WebEOC does provide a resource for posting and transferring information, improvements are needed in WebEOC in terms of customizing information boards, initial log-in problems, features (such as Instant Messaging), providing high availability, and training. In addition, WebEOC has not been implemented in all jurisdictions (particularly smaller cities) and a strategy is needed to ensure that all cities are provided with some common means of sharing information and coordinating actions. Finally, WebEOC has been implemented as standalone system and the various installations do not communicate with each other so there is no common platform for all locations.
Recommendations	Develop a regional WebEOC user group to establish guidelines for common design elements. Once determined, coordinate improvements across all installations of WebEOC and manage changes as a formal project with weekly or monthly progress updates. Investigate options for developing a high availability solution that provides remote failover capabilities for WebEOC. Also conduct sessions with all stakeholders to develop coordination plans, particularly with those locales that have not implemented WebEOC.
Actions	Appoint a WebEOC user group with a steering committee responsible for managing improvements and reporting progress to all stakeholders. Also create an exercise where the EOC/ECC Representatives and Emergency Managers from each stakeholder agency along with the WebEOC coordinator (if applicable) practice in the same location at the same time so that each group can understand and appreciate how the other works.

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

Task	Impact Reporting and Analysis
Issue	The generation of regional impact assessment and analysis ensures that local leaders can develop strategic plans for addressing “big” picture issues.
Reference	Regional Impact MSEL: All Sim Cells All Incidents
Summary of Issue	Assessing the regional impact of the incident relies on a combination of technology tools (for incident reporting by field representatives and key stakeholders) as well as coordination across all jurisdictions.
Consequences	A lack of regional situational awareness can slow response to areas in need as well as impair the ability to prioritize response and recovery efforts. Additionally, the formation and implementation of organized plans of action are essential to prevent wasted effort and conflicting goals for response and recovery.
Analysis	Local response plans were developed with some regional plans generated at the county and state levels however formal organized Incident Action Plans (IAP) were not apparent and coordination between the cities, counties, and state was lacking.
Recommendations	Implement regional coordination forums with stakeholders across all jurisdictions. Participants would be expected to develop guidelines and processes for coordinating regional impact reports and analyses. Based on the group’s work, conduct regional training sessions with small scale table-top exercises involving multiple jurisdictions to promote coordination.
Actions	Conduct regional coordination forums through the Regional Catastrophic Planning Grant as well as regional training that include small scale exercises involving multiple jurisdictions.

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

Task	Public Information Dissemination
Issue	Unified messaging is a fundamental goal for public information dissemination.
Reference	MSEL 10:30, 11:30, 12:30, 13:30, 14:00: State EOC / Other ad hoc media requests to King County Requests for briefings by the news media.
Summary of Issue	Communication to the public (all impacted populations including special needs areas) regarding events, actions taken, situation status, and instructions must be provided as soon as practical following a catastrophic incident. The key is providing accurate and timely reports that are consistent across all jurisdictions - this forms the basis for the goal of unified messaging via a Joint Information System (JIS). Lastly, working with news media partners is a key requirement for ensuring that information flows out to the local citizenry.
Consequences	Lack of coordination between the PIO's/JIC can result in conflicting reports and instructions from multiple jurisdictions. This will quickly erode public trust and could possibly make situations worse.
Analysis	Although the various PIO's performed well individually, coordination between jurisdictions was only partially achieved.
Recommendations	Review any existing JIS/JIC/PIO checklists to ensure regular communications with partners and the public, and that all diverse/special needs populations are addressed. Also include specific regional coordination points. For example establish a defined time for regional PIO/JIC updates and conduct conference calls, ViPR sessions, or chats to ensure inter-jurisdictional communication. An example would be to have PIO/JIC updates at 0:15 minutes after the top of the hour. An alternative would be a regional PIO/JIC bulletin board that is segmented by geographic area for posting and reviewing updates.
Actions	Review current JIS/JIC/PIO plans and (if needed) create additional checklists to ensure that all populations are addressed. Furthermore, determine how multiple levels of technology (including chat rooms) can be used to more fully coordinate activities. Establish scheduled times for JIC/PIO inter-jurisdictional information sharing sessions. Continue to work with local news media to promote relationships and ensure that the protocols and infrastructure needed to quickly communicate are in place. Also conduct a separate JIC/PIO exercise with representatives from each jurisdiction in the same location at the same time so that each can understand how the other operates.

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

Task	Resource Allocation
Issue	A major goal of regional planning is the ability to share available resources between areas of little or no impact with jurisdictions in need.
Reference	Regional MSEL: All Sim Cells All Incidents
Summary of Issue	Optimizing the utilization of resources regionally is essential after a catastrophic incident when the local area impacted can be expected to be overwhelmed and simultaneously short of resources. Resources may include personnel, equipment, supplies, or other capabilities.
Consequences	The inability to allocate resources effectively has immediate consequences in terms of response and recovery. Major issues include: undue public hardship, potential loss of life, a lengthening of recovery times, and negative media coverage. A lack of proper resource allocation can have severe consequences locally, regionally, and statewide. A clear example was the response to Hurricane Katrina where needed resources were available but not dispatched or allocated to areas in need.
Analysis	While resources were allocated locally at the city, county, and state level, coordination and distribution of resources between jurisdictions was not achieved.
Recommendations	Each jurisdiction must proactively assess their resource needs and reach out to other jurisdictions with defined lists of resource needs as well as resource availability. In addition, while some jurisdictions looked beyond the State of Washington for resources, a fully coordinated effort is needed to ensure that such mutual aid is organized to optimize capabilities throughout the region.
Actions	Each city, county, and the state need to continue to develop and train on mutual aid requests. One process that should be considered is for each city to report resource needs/availability up to the counties which would then be responsible for coordination with the state. The Regional Catastrophic Preparedness Grant should direct funding towards addressing regional logistical coordination. Overall there is a need for a teaming exercise that is not disaster related as a means for developing teamwork and communication at a personal level across the various groups.

Overall Results

The following sections provide summaries of the feedback received from the Exercise Evaluators, Players, Observers, and Controllers.

Positive Outcomes

- Sound Shake '08 was an ambitious event and the ability to conduct a regional exercise with the scope, complexity, and number of participants involved proved to be successful. A number of valuable lessons learned have been documented and areas of improvement identified that will better prepare the public and private sector to respond to a catastrophic disaster.
- The 800 MHz radio system worked and the participating cities, counties, and the state were able to use the system to communicate.
- The Amateur Radio system (voice and mail over radio) and operators functioned very well.
- Distribution of bulletins via E-mailed worked well.
- The Players were generally able to respond well within their respective groups and exhibited a high degree of teamwork and capabilities.
- In general, the PIO's at each location managed their responsibilities well during the exercise, however communication and coordination in terms of a Regional Joint Information System (JIS) and Regional Joint Information Center (JIC) operations needs improvement.
- New players were incorporated into the exercise and gained experience in handling issues in a simulated environment.
- Use of WebEOC (where utilized) provided a standard means for communicating status and issues. The exercise also provided additional opportunities for training.
- The Players, Observers, Controllers, and Evaluators all believed that the exercise was valuable and that more should be conducted.

Lessons Learned

The following lessons learned were observed during the exercise and generally apply to all sites. Each observation is listed by the following major categories:

- Communications
- Training
- Planning
- Operations
- WebEOC³

Communications

- At the beginning of the exercise, amateur radio and satellite telephone calls were generated however, not all calls were initially answered. A lack of personnel on-site at the early stage of the exercise (due to the cold start) contributed to this problem. Additional priority needs to be placed on training to allow additional staff to assist in communications especially at the onset of an incident. Priority must be placed on incoming communications.
- Communications between various EOC's/ECC's needs improvement. County to City and County to State communications were not frequent so information sharing and coordination was lacking. For example: The local EOC's did not communicate effectively with the State EOC. Direct communications between the primary impacted City or County and the State is essential as soon as practical after an incident. One issue that complicates communications is that Washington is a "home rule" state. Cities can bypass the County and communicate directly to the State. This can hamper situational awareness at the county level and can also lead to communication of stale information between the county and state as well as create a lack of communication between the cities and county. Procedure updates and training is essential and additional multi-jurisdictional exercises are needed, particularly with smaller cities.

³Listed separately as a category due to the criticality of this system and the number of responses related to WebEOC.

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

- Communication between groups within EOC's and ECC's was sometimes lacking. In some cases not all participants knew who was present from all the agencies/jurisdictions that were being represented. In other cases, participants did not know how to contact other groups.
- Generally, the PIO's communicated well within their EOC or ECC groups but did not always communicate with other EOC/ECC PIO representatives and coordination between the various jurisdictions and the state was not apparent. In addition, there is a need to validate facts and instructions to the citizenry with all knowledgeable groups prior to release.
- A Regional Joint Information System (JIS) was not implemented. Information was handled from the local PIO perspective. In order to be successful, multiple levels of communication across jurisdictions are needed so that unified messaging can be achieved. During the exercise, coordinated communications between multiple jurisdictions was not always apparent. How soon the JIS can be implemented in a catastrophic scenario should be defined so that expectations are realistic.
- ECC/EOC's need to actively seek updates and input from regional partners rather than passively waiting for information. Active polling of all jurisdictions is needed to verify contact at the onset of the disaster. This will ensure that all locations are accounted for and areas are not overlooked if they are not able to contact their respective County EOC or ECC or the State.
- Terminology needs to be consistent and accurate. Phrases such as "Shelter in Place" and "Stay in Place" were used but mean different actions. In addition, there are differences in the terminology utilized by the public and private sectors.
- WebEOC is not set-up for individual information centers to see what press releases/information are being sent out and which rumors have been addressed. In some agencies the Pier System is used. This can result in misinformation, stale data, and double-entry.
- Media Clips reported errors like Shelter in Place instead of Stay in Place. Also, media reports stated that SeaTac Airport was open despite injects having it closed due to damage. Inaccurate reporting should be anticipated. The PIO needs to assign staff to monitor news media for inaccurate messaging.
- PIO's need to understand what types of alternate communication are available and utilize different approaches based on the situation and not rely solely on media briefings and press releases. For example, some information can be sent via amateur radio, 800 MHz radio, E-mail, satellite telephone, or through an out of area partner.
- During the first 12 hours of a disaster there is a need to issue safety messages in multiple languages instead of focusing on other non-priority issues. A focus needs to be placed on what can be done - not what can't be accomplished or issues outside the

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

responsibility of the PIO.

- PIO's need to understand all positions in the EOC/ECC and know which areas are represented by whom to assist in confirming information.
- Updated contact lists including radio frequencies, E-mail addresses, satellite and land line phone numbers, liaison information along with consistent position titles are needed. With regards to position titles, various terminologies were used during the exercise. For example one group may call with a message for "Electrical" whereas other jurisdictions may refer to the responsible group as "PSE" or "Utilities".
- Some E-mails sent by players were never answered and may have not been reviewed at all since there was no response to return receipt requests.
- RPin.org was an excellent resource for getting information out to the public, though it requires a robust Internet connection. A one page summary table may be beneficial since much of the data gets repeated from message to message. Edits could then be made to the summary table which is updated for every message. This would alleviate the need to review all messages to gain a complete understanding of the situation.
- The frequency of updates to the public should be increased. Establish a cycle of posting information at certain times and make it a priority to get information out quickly (such as hospital status). The key here is to ensure that accurate and timely information is provided in a coordinated manner. In addition, it is important to provide the news media with initial information as soon as they arrive on what we know and top messages at that time so that public safety messages get out quickly.
- Sorting through the number of incoming messages for critical information that was needed for Press Releases was a challenge and can lead to delays.
- Winlink (E-mail over packet amateur radio) worked superbly (where the capability existed) especially to remote populations.
- Satellite phones did not always work for all jurisdictions. The major satellite providers should be evaluated to ensure that the most reliable network is used throughout the region and the state.
- Some Satellite telephones have international numbers and could not be dialed from local ECC/EOC's.
- There is a need to triage messages coming into all EOC's and ECC's. The volume of messages requires a sorting process to ensure that critical messages are given priority attention.
- Jurisdictions do not share the same E-mail systems. Consequently there is no single shared address book containing all key

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

contacts at each level of response, i.e., cities, counties, and state. In fact, while Microsoft Exchange is generally a common platform, some locations may use Lotus GroupWise instead.

- Consider revising the JIC plan to have an official disseminator of information to media and other communications channels. Perhaps move this function from the information team to the media team.
- The exercise included a 9-1-1 system outage which required the public to dial 10-digit phone numbers to get emergency assistance in the affected area. During the exercise, information disseminated to the public was not effectively coordinated. If a 9-1-1 outage were to occur, it is critical that public dissemination of information be fully coordinated and communicated between the JIC/PIO's and the emergency response agencies.
- Media monitoring needs improvement (radio and TV stations). In a real life scenario, there will be a flood of local and national media requests demanding information and immediate interviews.
- Some of the newer operational and planning staff didn't seem to appreciate the critical role of public information in emergency response. Others provided information that wasn't appropriate for release.
- The amateur radios were overwhelmed and additional staffing may be needed during an actual regional catastrophic incident.

Training

- WebEOC training was frequently cited as an ongoing need (see WebEOC Lessons Learned section for details).
- Training on the use of communication resources is required to ensure that all personnel, regardless of jurisdiction or department are fully capable of utilizing the system in an emergency.
- Participants within the ECC/EOC's sometimes did not know who performed what function or who to contact for resources or needs.
- The need for additional National Incident Management System (NIMS) training was cited by some players after the exercise. Roles and responsibilities were sometimes not clear. In addition coordination between Emergency Support Functions (ESF) was an issue.
- Media response training is an ongoing effort and all public officials that may be called upon to conduct press briefings or interviews need to be trained. In some cases public officials did not always look into the camera or talk into the microphone or speak from the podium. In addition, summarizing the question to ensure that the audience is clear on what the speaker is

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

answering would be beneficial particularly if viewers miss the entire question or to make clear the context of the response.

- Training needs to include practicing moving messages back and forth between EOC's and ECC's to ensure that dissimilar forms can be understood. Training also needs to include those responsible for inter-jurisdictional communications to ensure that reports are understood. The effort should be made to standardize forms and verbiage.
- Additional training is needed on how to route resource requests and how to prioritize resource requests in local ECC/EOC's.
- Training sessions at all EOC's/ECC's in the use of Pacific Northwest Seismic Network (PNSN) and U.S. Geological Survey (USGS) products are needed. Training needs to include learning how to use ShakeMap⁴, CISN⁵ display, CIIM⁶, and ShakeCast⁷.

For example with ShakeMap:

- No one except the Washington State Emergency Management Division (EMD) knew how to use Shape files, what their potential was, or how to register them.
- The ability to zoom in on a smaller area of a ShakeMap would make it more useful. An alternative would be to train local users to use the Shape files so the relevant portions could be overlaid on their own local GIS maps.
- Although all jurisdictions have access to GIS professionals, most don't have HAZUS installed and few have any HAZUS training. Training needs to be ongoing and regular exercises conducted to ensure that knowledge is retained. Also if HAZUS is to be used as a tool, its implementation and use needs to be standardized across all locations.

Planning

- Disaster plans and Standard Operating Procedures were generally not used by the participants. In most cases there is a high degree of dependence on individual knowledge. This can become a critical issue if key personnel are not available during a catastrophic disaster.
- Some jurisdictions manage incidents in strict accordance to NIMS and tasks are segmented according to ESF. However in some

⁴ ShakeMap (<http://earthquake.usgs.gov/shakemap>)—rapidly, automatically generated shaking and intensity maps—combines instrumental measurements of shaking with information about local geology and earthquake location and magnitude to estimate shaking variations throughout a geographic area.

⁵ California Integrated Seismic Network <http://www.cisn.org/eqinfo.html> - part of the Advanced National Seismic System (ANSS)

⁶ Community Internet Intensity Map (CIIM) <http://pubs.usgs.gov/fs/fs030-01/>

⁷ An application for automating ShakeMap delivery to critical users and for facilitating notification of shaking levels at user-selected facilities.

<http://earthquake.usgs.gov/resources/software/shakecast/>

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

cases it is apparent that one ECC/EOC representative cannot manage all of the duties required under a particular ESF. In addition, the difference in organizational structure of ECC/EOC's created confusion when attempts to communicate and coordinate across ECC/EOC's.

- The division of responsibilities and priorities of each ESF or POD was not always clear. Players need to focus on the particular tasks to which they have been assigned.
- The use of mapping technology needs to be formalized and processes implemented to take advantage of GIS mapping. Most locations cited the need for better utilization of these tools for use in damage assessment as well as understanding the overall impact of the incident on the region – particularly the status of local transportation routes.
- As a generalization, the planning that does occur within cities, counties, and the state may cite the need for cross-jurisdictional/agency coordination, however the practical plans, infrastructure, and training required to actually implement a unified approach to regional catastrophic incidents needs to be further developed.

Operations

- Communications staffing needs to be a priority particularly in the early stages of an incident. During the beginning part of the exercise, Communications personnel were overwhelmed and it was difficult to manage the 800 MHz radio, amateur radio system, and satellite telephones.
- Joint coordination between the various participating cities, counties, and state was never fully achieved. Each location tended to work individually. While some attempts were made in coordinating activities through conference calls, ViPR calls, and other means a complete integrated picture never materialized resulting in a lack of regional situational awareness that was shared across all sites.
- Coordination of operations with partners needs improvement. Regional partners are dependent on information about the disaster, e.g., the status of local infrastructure. Conversely, the public sector can use the resources made available by regional partners to provide additional aid to the population, e.g., food, water, transportation, and shelter.
- Decision-making on temporary shelters was slow. In addition each jurisdiction responsible for managing temporary shelters needs to coordinate their activities with one another as well as with key partners such as the American Red Cross. Furthermore, checklists are needed to ensure that all aspects of temporary sheltering are considered. Examples include provisions for:

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

- Food and water
 - Hygiene and sanitation facilities
 - Rubbish and debris removal
 - Hearing impaired and other special needs
 - Transportation
 - Heating and/or cooling
 - Security
 - Foreign language translators
 - Animal sheltering
- Communication of shelter locations to each ECC/EOC needs to provide details in terms of capacity and current status. During the exercise, there were references to “safe refuge” areas but no details. Standardizing what shelter information will be reported between ECC/EOC is one option.
 - The use of public and private facilities as shelter locations needs to be pre-planned and coordinated. In an extreme catastrophic situation, once the Governor has requested Federal aid, Federal responders could also have plans to setup shelter operations at a location that is already in use or planned for use. Consequently it is imperative that such decisions are coordinated at all levels of government.
 - Responsibilities within each location were not always clear. Several participants in multiple locations stated that they were unsure of where to obtain needed information or resources. The development of a standard “key” for each incident with each position and their roles (POD or ESF) as well as phone numbers could help with this. While documentation already exists, a one page handout or large board would be useful as a reminder. In fact, the “modernization” of most ECC/EOC’s with electronic status boards needs to be combined with physical charts that are posted on the walls. While electronic tools are helpful, players often lose focus on the overall picture. Note: it is imperative that physical status or information boards be updated and kept in sync with WebEOC. The date and time of updates needs to be included on each board.
 - The need for shift planning and anticipating future needs was lacking. There is a need to look beyond Day 1 and project out resource requirements and staffing to manage a 24 hour / 7 days a week long term incident.
 - Maps were frequently cited as a need. In addition, not all jurisdictions have the technology or personnel skills to implement GIS tools.
 - HAZUS damage projection maps were not fully utilized due to a technical problem in the E-mail message from the State. One proposed solution was to create an FTP site to post maps that can be shared across jurisdictions/agencies.
 - Maps were used extensively at some ECC/EOC’s but only minimally at others. Greater use of mapping capabilities would provide

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

a means for improving overall situational awareness particularly at the policy level and for enabling responders to focus on likely damage sites (for the main event as well as subsequent aftershocks).

- Community Internet Intensity Map (CIIM) data needs to be incorporated into Pacific Northwest ShakeMaps. Furthermore, the high-resolution map could be a valuable tool and its development should be encouraged as a future direction for the national ShakeMap effort.
- The scale of ShakeMaps needs to be considered. A focus on local jurisdictions that includes overlays of key structures and infrastructure would make them more valuable and encourage their use.
- There was little to no awareness at all of CISN (California Integrated Seismic Network – part of the Advanced National Seismic System) Display which provided local seismic data.
- In general the use of pre-designed forms was limited. The lack of form use to document issues may be due (in part) to the accelerated pace of the exercise (compared to an actual incident) however if forms are to be used as a tool, additional training is needed to ensure that forms are used effectively.
- There is a need for updated contact lists. Not all locations had up to date information or distributed contact lists to all players. Contact lists need to include all agencies and jurisdictions.
- It would be useful to pre-plan shelter locations and staging areas as well as local base of operations. Similarly, jail and court locations need to be pre-developed as well as alternate strategies for continuing operations.
- Acronyms are sometimes agency specific and can lead to miscommunication between groups. A standard list for the region should be made available at all locations based on NIMS – possibly through WebEOC.
- Clear definition of ESF roles is needed. The creation of a regional "ESF Quick Guide" would be beneficial including quick tabs for ESF functions as a reference. Also gather appropriate local/state/national plans for specific ESF's, i.e., tri-county mass casualty plan and state fire mobilization plan.

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

- In general, there is a need for command and general staff positions to delegate more so that they can focus on larger issues and on communication and coordination with leaders.
- Regularly scheduled situational briefings between command and general staff positions are needed. Following a scheduled process will help ensure that information is shared across groups and provide leadership with a common picture of the situation.

WebEOC

NOTE – Seattle EOC chose by design not to utilize WebEOC for this exercise.

- WebEOC training at the local level continues to be a challenge. This is a recurring issue even though training classes are routinely conducted. The majority of players cited the need for additional training in the feedback responses.
- The WebEOC interface was frequently mentioned as needing improvement. Also many participants cited the need for additional boards in WebEOC.
- The system requires a high availability solution to ensure that access is available if local servers are down or normal Internet access is unavailable.
- There is a need for continual monitoring of WebEOC for updates. It is often difficult to monitor the system while managing individual activities and priorities. Similarly, updating information in WebEOC is sometimes delayed causing the potential for obsolete data. This is especially important at the policy level where key information needs to be periodically discussed to ensure a common understanding of the current situation, i.e., to obtain situational awareness. While WebEOC can be valuable, operational briefs still need to be scheduled and conducted.
- WebEOC is not used by all jurisdictions and some jurisdictions only use it on a limited basis.
- WebEOC implementation is scattered and the various instances of the system do not communicate with each other.
- Items posted to the Significant Event screen show time approved, not when reported. This lead to confusion and questions regarding the quality of information and if outdated or erroneous information was being posted. Also, every person posting to WebEOC should have a department/group affiliation shown.
- Log-in problems with WebEOC continues to be an issue.
- During the exercise, several participants stated that the WebEOC position log was not working.

Homeland Security Exercise and Evaluation Program

Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

- The capability of radio operators to key data directly into WebEOC should be considered. This could speed up response and reduce the need for double entry (physical forms and WebEOC).

Action Items (Improvement Plan)

Communications

Improvement Category	Communications Action Items
Staffing	<ul style="list-style-type: none"> • Assess anticipated ECC/ECO communication workload during a disaster and evaluate training additional staff to assist in communications especially incoming calls at the onset of an incident. Responsibilities would be limited to only answering, triaging, and routing calls. The benefit would be to help ensure that calls are answered in a timely manner.
Coordination	<ul style="list-style-type: none"> • Conduct more multi-jurisdictional exercises in conjunction with smaller cities. • Establish and agree upon protocols for coordination during a catastrophic incident. This requires the involvement of all stakeholders (cities, counties, and the state) and a multi-jurisdictional task force made up of all emergency management offices statewide. Key topics include: <ul style="list-style-type: none"> ○ “Home rule” issues ○ Intergroup communications within EOC’s and ECC’s ○ Future planning training and exercises to ensure that intra-group coordination and communication is improved ○ Protocols on how and when to contact other groups. This action item applies to <u>all</u> areas within the EOC’s and ECC’s ○ Responsibilities for tracking the status of all jurisdictions (i.e., cities to contact their home counties or cities to contact the state directly)

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

Improvement Category	Communications Action Items
Technology	<ul style="list-style-type: none"> • Review the current use of technology in managing press releases and information. Since WebEOC implementation is distributed across multiple jurisdictions and does not provide a common repository for press releases and related information, there is a need to ensure that “unified messaging” is achieved. • Train and exercise the PIO’s understanding of all alternate communication technologies available to them. Incorporate these technologies into plans for information distribution. • Develop a one page summary table in RPIN to provide a current “dashboard” summary of status. • Update contact lists including radio frequencies, E-mail addresses, satellite and land line phone numbers, liaison information and ensure that position titles are consistent. • Incorporate the use of Winlink (E-mail over packet amateur radio) in future plans and exercises. • Evaluate the major satellite providers and ensure that the most reliable network is used throughout the region and the state. Ensure that satellite telephones do not have international numbers or update systems to ensure that international numbers can be dialed from local ECC/EOC’s. • Develop a single shared electronic address book containing all key contacts at each level of response, i.e., cities, counties, and state. One option is to develop an address book and upload it monthly to each EOC/ECC. For example a spreadsheet could be used that is uploadable to various systems. • Develop a system to ensure that all incoming E-mails are reviewed and acknowledged. This may require larger communications teams at each ECC/EOC.
Terminology	<ul style="list-style-type: none"> • Develop a standard list of terms. This list must be made part of normal daily operations so that all groups responsible for managing an incident are fully familiar with same terminology. • Establish standard ICS position titles. Examples of existing variance include “Electrical” versus “PSE” versus “Utilities”.

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

Improvement Category	Communications Action Items
Continuous Improvement	<ul style="list-style-type: none">• Include regional lessons learned issues from other drills into future exercises.• Develop a means for PIO's to ascertain key information for Press Releases. Better logging of key events on an EOC/ECC dashboard is one option. Another option is to dedicate a PIO resource to continuously poll each POD or group to obtain quick status reports on a continuous basis.• Develop a process to triage messages coming into all EOC's and ECC's.
Media Partners	<ul style="list-style-type: none">• Develop processes for issuing multiple language safety messages within the first 12 hours of an incident.• Increase the frequency of updates to the public. Establish a cycle for posting information at pre-determined times.• Develop rapid information sharing plans to get information out quickly to the news media.

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

Training

Improvement Category	Training Action Items
Technology	<ul style="list-style-type: none"> • Train all personnel on the use of alternate communication equipment. • Train all EOC's/ECC's in the use of PNSN and USGS products. Train to include ShakeMap, CISN display, CIIM, and ShakeCast.
Plans and Procedures	<ul style="list-style-type: none"> • Conduct additional National Incident Management System (NIMS) training and ensure that coordination processes between Emergency Support Functions (ESF) are understood. • Conduct continuous training to ensure that all ECC/EOC personnel understand all functions and who to contact for resources or needs. • Include training and practice on moving messages back and forth between EOC's and ECC's to ensure that dissimilar forms can be understood and work on standardizing forms and verbiage. • Conduct training on how to route resource requests and how to prioritize resource requests in local ECC/EOC's. • Include in training the importance of scientific details and their meaning so that critical details or descriptions are understood.
Media Response	<ul style="list-style-type: none"> • Conduct additional media response training to ensure that public officials responsible for conducting news briefings understand and practice how to speak "on camera".

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

Planning

Improvement Category	Planning Action Items
Reliance on Individual Knowledge	<ul style="list-style-type: none"> • Ensure that Disaster Plans and Standard Operating Procedures are up to date and used. • Work on reducing the current reliance on the same individuals for knowledge in the event that key personnel are not available during a catastrophic disaster.
Procedures	<ul style="list-style-type: none"> • Work on developing standard procedures that will account for the fact that some jurisdictions manage incidents in strict accordance to NIMS while others do not. • Ensure that resources are sufficient to allow for each ESF representative to manage their assigned duties and not be overwhelmed. This could involve cross-training between ESF areas. • Ensure that staff understand the division of responsibilities and priorities of each ESF or POD. This may require additional clarity in plans as well as incorporation of additional materials such as responsibility matrices in training.
Plans	<ul style="list-style-type: none"> • Develop a unified approach to managing incidents'. Develop the practical plans, infrastructure, and training required to actually implement a unified approach to regional catastrophic incidents.
Technology	<ul style="list-style-type: none"> • Formalize and implement processes to take advantage of GIS mapping tools during an incident.

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

Operations

Improvement Category	Operations Action Items
Staffing	<ul style="list-style-type: none"> • Ensure that Communications staffing is the priority (particularly in the early stages of an incident). • Develop processes to staff all communications areas including: 800 MHz radio, amateur radio system, and satellite telephones.
Coordination	<ul style="list-style-type: none"> • Continue to work on joint coordination between the cities, counties, and state. Ongoing working groups are needed to ensure that coordination details can be developed, documented, trained, and exercised. • Improve coordination of operations with Regional partners. Include information needs and how to coordinate the availability of resources and how Regional partners can contribute to the response operation. • Ensure coordination of shelter needs with other jurisdictions and key Regional partners such as the American Red Cross. Develop checklists for all aspects of temporary sheltering. • Develop procedures on how each ECC/EOC documents and communicates details in terms of capacity and current status.
Planning	<ul style="list-style-type: none"> • Pre-plan and coordinate the use of public and private facilities as shelter locations and staging areas as well as potential local base of operations sites. • Clarify responsibilities within each location and ensure that all ECC/EOC personnel understand where to obtain needed information or resources. • Develop a standard “key” for incidents with each position and their roles (POD or ESF) as well as phone numbers. While documentation already exists, a one page handout or large board would be useful as a reminder. • Combine electronic status boards with physical charts posted on EOC/ECC walls. It is imperative that physical status or information boards be updated and kept in sync with WebEOC. The date and time of update needs to be included on each board.

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

Improvement Category	Operations Action Items
	<ul style="list-style-type: none"> • Plans and training are needed for looking beyond Day 1. The ability to project resource requirements and positioning is required to manage a 24 hour / 7 days a week long term incident. • Update contact lists. Not all locations had up to date information or distributed contact lists to all players. Contact lists need to include all agencies and jurisdictions.
Execution	<ul style="list-style-type: none"> • Improve the use of pre-designed forms during exercises and actual incidents. Conduct additional training to ensure that there is a common understanding of the importance of utilizing forms. • Develop a standard list of acronyms based on NIMS – possibly through WebEOC. • Create a regional "ESF Quick Guide" with tabs for ESF functions as a reference. • Gather appropriate local/state/national plans for specific ESF's, i.e., tri-county mass casualty plan and state fire mobilization plan so that these can be utilized during an incident. • Ensure that command and general staff practice and understand the need to delegate so that they can focus on larger issues and on communication and coordination with other leaders. • Schedule situational briefings between command and general staff positions on a recurring basis. Following a scheduled process will help ensure that information is shared across groups and provide leadership with a common picture of the situation.
Technology	<ul style="list-style-type: none"> • Improve the use of maps at all EOC/ECC locations. • Review current staffing and skills for using GIS tools. • Make better use of HAZUS damage projection maps. Create a FTP site to post maps that can be shared across jurisdictions/agencies. • Incorporate Community Internet Intensity Map (CIIM) data into Pacific Northwest ShakeMaps. • Further develop high-resolution maps as a future direction for the national ShakeMap effort. • Generate ShakeMaps at a scale suitable for local jurisdictions. Include overlays of key structures and infrastructure. • Conduct additional technical and user training on all GIS tool and their use including the CISN Display.

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

WebEOC

Improvement Category	WebEOC Action Items
Training	<ul style="list-style-type: none"> • Conduct additional WebEOC training after determining the root cause of the deficiencies cited by the exercise participants. Key questions include: <ul style="list-style-type: none"> ○ Are we training the right people? ○ Is the training process sufficient? ○ Are the training materials comprehensive enough? ○ Does training include actual hands-on experience? ○ Are needed personnel allowed to attend training?
Technology	<ul style="list-style-type: none"> • Currently the various implementations of WebEOC are vulnerable to downtime if the primary system goes down or connectivity is lost. Since WebEOC is such a key tool, the system requires a high availability solution to ensure that access is available if local systems go down.
Configuration and Customization	<ul style="list-style-type: none"> • A Regional WebEOC Steering Committee should meet on a regular basis to coordinate standardization across all WebEOC implementations. Input is needed from all levels of organizations. Further, in order to ensure that recommendations are implemented, a project team should be formed to manage the change process and be responsible for reporting progress to the Steering committee. Where possible, standardization should allow for the sharing of techniques across jurisdictions. Key areas for review include: <ul style="list-style-type: none"> ○ WebEOC interface among major cities, counties and state ○ Additional boards ○ Modify the Significant Events screen to show time reported (as well as time approved). In addition, every person posting to WebEOC should have a department/group affiliation shown. ○ Common Log-in problems with WebEOC ○ Placement of WebEOC icon on the desktop to ease access

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

Improvement Category	WebEOC Action Items
	<ul style="list-style-type: none"> ○ Investigate complaints that the WebEOC position log was not working ○ Use WebEOC to track the location of personnel, i.e., WebEOC users could be given a prompt to log into their physical location) which would automatically provide a log of personnel at each site ○ A screen to enter local area damage ○ The capability of radio operators to key data directly into WebEOC
Implementation and Use	<ul style="list-style-type: none"> ● Assign a team in each EOC/ECC location to continuously monitor WebEOC for updates. ● Considered assigning a team to work with each group in the EOC/ECC and input updates. Team members could be assigned (one to each group) so that data entry is standardized and redundant information is not entered. Both the incoming message monitoring function and the data entry function could be manned by volunteers ● Conduct regularly scheduled operational briefs to supplement WebEOC at each EOC/ECC. ● If WebEOC is to be used as a common tool, address the fact that WebEOC is not used by all jurisdictions and some only on a limited basis. ● The fact that WebEOC implementation is scattered and the various instances of the system do not communicate with each other needs to be evaluated and a solution found (system or work around).

CONCLUSION

Overall, the exercise was a success. The exercise involved multiple jurisdictions, regional partners, numerous volunteers (approximately 500 total participants). A major goal of all exercises is to identify strengths and areas for improvement. Consequently this exercise allowed each jurisdiction to clearly understand their current state of preparedness and provides a roadmap for future development, training, and exercises. Implementing the action items listed in this After Action Report and Improvement Plan will further prepare the region to handle any catastrophic incident.

In addition, the exercise provided a challenging experience to the participants. The need to work further on communication and coordination between multiple jurisdictions across the geographic area was clearly demonstrated. Also, operations that did work well were further reinforced and highlighted by the exercise. Finally, this event further confirmed the level of commitment that the region has in ensuring that it is capable of effectively managing a catastrophic disaster.

APPENDICES

Appendix 1 – List of Primary Exercise Participants and Roles

ROLE	NAME	ORGANIZATION
Master Control Cell		
Exercise Director	Tietje, Grant	City of Seattle
Deputy Exercise Director	Tait, Dave	Sound Shake '08
Master Control Cell Seattle POC	Griffin, Cliff	IMT-IC -Woodinville Fire
Master Control Cell -State and Bellevue	Edwards, William	IMT -SPD
Master Control Cell –Snohomish County and King County	Adler, Mark	IMT -Burien FD
City of Bellevue EOC		
Lead Controller	Owens, Vernon	City of Bellevue EM
Controller	Gough, Chris	SPD
Controller	Nickels, Sharon	EPA
Evaluator	Evans, Martha	PIO/IT-Bellevue
Evaluator	Nissley, Jerry	Parks and Sheltering-Bellevue
Evaluator	Kessack, Ron	Transportation-Bellevue
Evaluator	Boyd, Tad	MLC & Associates, Inc.
Sim Cell Chief	Chen, Jeff	Medina PD
King County ECC		
Lead Controller	Kelly, Heather	KC OEM
Controller	Hubbard, Walt	KC DOT
Controller	Grisham, Martin	Tukwila
Controller	Strouse, Mike	KC DES
Controller	Quick, Jaime	Consultant
Evaluator	Whalen, Doug	United Way

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

ROLE	NAME	ORGANIZATION
Evaluator	Gleaves, Kathy	Alaska Airlines
Evaluator	Brown, Carl	IBRD
Evaluator	Seel, Dennis	MLC & Associates, Inc.
Evaluator	Khoong, Wai Kin	MLC & Associates, Inc.
Evaluator	Takemura, Bob	MLC & Associates, Inc.
Evaluator	Baz, Shawn	Amgen
Sim Cell	Vitali, Stephanie	KC DOT
Sim Cell	Parker, Sharyn	KC DOT
Sim Cell	Howard, Kathryn	KC OEM
Sim Cell	Nolet, Kevin	ESFR
City of Seattle EOC		
Lead Controller	Friedman, Robin	SPU
Controller	Flores, Chris	Tukwila Fire
Controller	Verhaar, Pete	SPD
Controller	McDonagh, Paul	SPD
Controller	Rubenstein, Peter	EPA
Controller	Jarolimek, Elenka	Seattle EMD
Controller	Morris, Dedra	Independent
Evaluator	Madden, Ryan	IBRD
Evaluator	Brown, Paul	MLC & Associates, Inc.
Evaluator	Meisner, Cheryl	Amgen Inc.
Evaluator	Havner, Jay	SFD
Sim Cell	Fletcher, Paul	SFD
Sim Cell	Besaw, Robert	
Sim Cell	Wheelock, Dana	Seattle Light
Sim Cell	Schneidler, Dave	SDOT
Sim Cell	Ryan, Andy	SPIO

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

ROLE	NAME	ORGANIZATION
Sim Cell	Sheppard, Mark	ACS (HAM Radio)
Health Sim Cell PH EOC	Mann, Danica	
Lead Controller PH EOC	Bonne, Diane	
Snohomish County EOC		
Lead Controller	Akerstrom, Carrie	Snohomish County EMD
Controller	Jackson, Lisa	Jackson International, Inc.
Controller	Mace, Tony	Paine Field Fire
Evaluator	Reagan, Bryan	Premera Blue Cross
Evaluator	DiBenedetto, Jonathan	MLC & Associates, Inc.
Evaluator	Perillo, George	Snohomish Police Dept
Sim Cell Lead	Doherty, Tammy	Snohomish County DEM
Sim Cell	Mack, Denise	Snohomish County DEM
City of Tacoma		
Lead Controller	Weber, Ute	
Region 3		
Lead Controller	Chapin, Jesse	
WA State EOC		
Lead Controller	Dudley, Lit	WA State EM
Controller	Jenson, Jerry	WA State EM
Controller	Simerly, Steve	WA State EM
Evaluator	Loza, Norma	MLC & Associates, Inc.
Evaluator	Carrido, Mary	MLC & Associates, Inc.
Evaluator	Smith, Andy	EPA
Sim Cell	Christensen, Stefani	WA State EM
Sim Cell	Garrand, Rosanne	WA State EM

Appendix 2 – Sound Shake 2008 News Release and Talking Points



King County

**Department of Executive Services
Office of Emergency Management**

NEWS RELEASE

Date: March 3, 2008

Contact: King County – Heather Kelly 206-423-2933
City of Seattle – Cornell Amaya, 206-368-1170
City of Bellevue – Vernon Owens, 425-452-6033
Snohomish County - Carrie Akerstrom, 425-388-5064
State of Washington – Rob Harper, 800-562-6108

Emergency management officials prepare for catastrophic earthquake *Wide coalition tests plans for Seattle Fault quake*

King County, WA – Earthquakes are the Puget Sound region's biggest threat and local emergency management officials are preparing now for the next big one. On Wednesday, March 5th over 50 local public and private sector agencies are testing emergency plans and communications by participating in a catastrophic earthquake exercise dubbed "Sound Shake '08".

"This scenario is our region's Hurricane Katrina," said King County Executive Ron Sims. "We must continue to test our emergency plans and systems with exercises such as Sound Shake. This will be an opportunity for us to continually improve our readiness."

Headed by the City of Seattle, King and Snohomish Counties, the City of Bellevue and the State of Washington, Sound Shake '08 will simulate the effects of a 6.7 magnitude earthquake along the Seattle Fault. Based on the [Seattle Fault Earthquake Scenario](#), a study written by the Earthquake Engineering Research Institute, the exercise will mock-up serious impacts to the region's transportation and communications systems. Additionally the scenario plan includes extended power outages, utility disruptions, and impacts to the health care system.

The involvement of numerous levels of government along with private companies is also seen as a key piece to the exercise.

"The effects of a large scale earthquake won't stop at a city or county line, or only impact the public sector," said Seattle Mayor Greg Nickels. "Sound Shake gives us an excellent opportunity to put our region's collaborative emergency planning to a test. We know that we must be able to communicate and respond together as a region."

While local officials conduct exercises such as Sound Shake to improve government readiness, residents of the Puget Sound region are encouraged to become personally prepared for earthquakes or other emergencies. Officials recommend three simple steps to improve personal and family preparedness: Make an emergency family communications plan, build an emergency supply kit and get involved in your community's preparedness. To find more information visit www.3days3ways.org.

Note to media: To schedule interviews with local officials prior to or day of the exercise, please use the above contact information.



King County
Department of Executive Services
Office of Emergency Management

Sound Shake 2008 Talking Points

- Wednesday, March 5th over 50 local public and private sector agencies are testing emergency plans and communications by participating in a catastrophic earthquake exercise dubbed “Sound Shake ‘08”.
- Exercises such as Sound Shake are opportunities for local emergency management officials to test plans, identify gaps, and make improvements.
- There will inevitably be lessons learned from this exercise.
- Sound Shake was collaboratively planned by the cities of Seattle and Bellevue, King and Snohomish Counties and the State of Washington.
- Sound Shake will simulate the effects of a 6.7 magnitude earthquake along the Seattle Fault.
- The Seattle Fault runs East-West from Harbor Island in Seattle to the base of the Cascade Mountains, crossing under Lake Washington near I-90. Many of the region’s critical utility and energy supply lines crisscross the Seattle Fault.
- All the simulated damage and impacts due to the earthquake are based on the Seattle Fault Earthquake Scenario, a study written by the Earthquake Engineering Research Institute.
- The exercise will include serious impacts to the region’s transportation and communications systems.
 - Major damage to the freeways and highways from Lynnwood to Federal Way.
 - Air traffic impacted with damage to local airports.
 - Stoppages to rail traffic from Bellingham to Portland.
 - Outages in telephones, cell phones and internet are planned.
- The scenario plan also includes extended power outages, utility disruptions, and impacts to the health care system.
- Residents of the Puget Sound region are also encouraged to become personally prepared for earthquakes or other emergencies. Officials recommend three simple steps to improve personal and family preparedness: Make an emergency family communications plan, build an emergency supply kit and get involved in your community’s preparedness.

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

Appendix 3 – Regional Impact Master Scenario Events List (MSEL)

Sound Shake '08 Functional Catastrophic Earthquake Exercise

March 5, 2008

REGIONAL IMPACT MASTER SCENARIO EVENTS LIST

Event #	Optional	Event Time	Event Description	Responsible Controller	Recipient Player(s)	Expected Outcome of Player Action
Pre 1		0720	Team Check in	Master Control call out		
		0730	C/E/S Check in	Site Specific		
Pre 2		0745	Final Team Check in	Master Control call out		
			STARTEX			
M1		0754	Magnitude 6.7 Earthquake on the Seattle Fault	All Sim Cells - Script	ALL	Initial safety precautions Call out of EOC personnel
		Site Specific	Power out regionally	All Sim Cells – controllers – can turn off lights to imitate, or just state the impact to start play	ALL	Establish backup power, document on generator power, calculate length
		Site Specific	Phones out (landline and cell)	All Sim Cells – controllers, can turn phones off or state the impact	ALL	Establish backup/alternate communications
M2	SHAKE MAP	0815	First Shake Map delivered via email	UW lab	ALL	

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

Sound Shake '08 Functional Catastrophic Earthquake Exercise

March 5, 2008

REGIONAL IMPACT MASTER SCENARIO EVENTS LIST

Event #	Optional	Event Time	Event Description	Responsible Controller	Recipient Player(s)	Expected Outcome of Player Action
M3	AUDIO Quake 1	0815	520 Bridge damaged and beyond use	Audio inject	ALL	Identify impacts, resource needs
M4	AUDIO Quake 2	0815	Alaska Way Viaduct collapsed	Audio inject	ALL	Identify impacts, resource needs
M5	AUDIO Quake 3	0830	East Channel Bridge down, unusable	Audio inject	All	Relay to State who forwards to other counties. Establish impacts to region.
M6	AUDIO Earthquake Everett	0830	US 2 Hewitt Trestle cracking/unstable	Audio Inject	All	ID impacts, resources
M7		0830	Ferry traffic stopped in Puget Sound	KC Sim Cell as KCSO Guardian One	KC ECC	Notification to State, Seattle EOC
M8		0845	Airport Damage - SeaTac unusable but Boeing Field unusable	King County Sim Cell via 800 MHz	King ECC	Notify State who will forward to other counties, notify Bellevue and Seattle EOC, ID Impact to region, resource suppliers, citizens
M9		0840	Expected disruptions to all utilities throughout the region based on HAZUS Report	State email with note to confirm via sat phone	King, Seattle, Bellevue, Snohomish	Establish impacts to region. Notify citizens
M10	AUDIO Quake 4	0850	I-5 at Puyallup River Bridge damaged	Audio Inject	All	ID impacts, resources
M11	VIDEO Clip 1	0855	Media Reports of EQ -	Video Inject	All	Initiate impact analysis
M12		0850	After shock 4.3	UW Lab	ALL	FYI
M13		0857	Updated Shake Map delivered via email	UW Lab	ALL	
M14		0900	Natural Gas out in King, Seattle and Bellevue	PSE HAM Radio Operator	King, Seattle, Bellevue,	Relay to State who forwards to other counties. Establish impacts to region. Notify citizens

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

Sound Shake '08 Functional Catastrophic Earthquake Exercise

March 5, 2008

REGIONAL IMPACT MASTER SCENARIO EVENTS LIST

Event #	Optional	Event Time	Event Description	Responsible Controller	Recipient Player(s)	Expected Outcome of Player Action
M15	AUDIO Earthquake Trains	0900	Reports of trains not moving per Burlington Northern	Audio Inject	ALL	
M16		0900	Rupture of liquid fuel line in Bellevue and Seattle	Seattle and Bellevue Sim Cells via HAM Radio	King	Relay information to State who forwards to other county EOCs. Establish impacts to region. Notify citizens
M17		0900	Water out in King, Seattle, and Bellevue	Seattle Sim Cell via HAM Radio	King, and Bellevue	Relay to State who forwards to other counties. Establish impacts to region. Notify citizens
M18		0900	Port Damage (Seattle-seawall failure, damage, Everett-minor damage) State DOT to add more	-Seattle Sim -Snohomish Sim -State Sim	-Seattle EOC -Snohomish EOC -State EOC	Relay information to State who forwards to other EOC's or direct contact with EOC for information sharing/WebEOC. Coordinate impacts, resources
M19		0910	Coleman and Fauntleroy Ferry terminals inoperable	Seattle Sim and State Sim	Seattle EOC and State EOC	Notification to Sno Co EOC for surge ID what to do with boats in the harbor, reroute north, ID long term impacts
M20	VIDEO Clip 2	0930	Impacts, phones down, misinformation about SeaTac damage	Video Inject	ALL	PIO initiate verification of report,
M21	AUDIO Drill Flooding	0940	Report of Seawall impacts, toss in the word Tsunami	Audio Inject	ALL	Planning, and address at least at PIO level the risk of Tsunami
M22	AUDIO Valley Emerg	0950	Collapse of 148 th Ave. interchange on I-90	Audio Inject	All	ID impacts, resources
M23	AUDIO Valley Emerg	0950	Food warehouses destroyed in Renton, Kent and Auburn.	Audio Inject	ALL	ID Regional impacts and coordination efforts.

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

Sound Shake '08 Functional Catastrophic Earthquake Exercise

March 5, 2008

REGIONAL IMPACT MASTER SCENARIO EVENTS LIST

Event #	Optional	Event Time	Event Description	Responsible Controller	Recipient Player(s)	Expected Outcome of Player Action
M24	AUDIO Valley Emerg	0950	167 Damaged from liquefaction	Audio inject	All	Establish impacts to region. Notify citizens, consider impacts to businesses/food supply
M25	VIDEO Clip 3	1000	Video Clip, 2 hours in, still reporting wrong info on SeaTac, fires in Seattle	Video Inject	ALL	PIO response
M26		1030	Phone service reestablished - 911 calls overloading the system	Local Sim Cell – inject	All	Public information messaging, identify alternate communication resources
M27	AUDIO Quake 5	1030	Smoke in Seattle, Schools impacted	Audio Inject	All	More impacts
M28		1048	Aftershock 4.7	UW Lab	ALL	FYI
M29		1030 – 1600	Phone calls flow in with damage reports, local injects, media requests, citizen needs, etc.	Local Sim cells	ALL	Respond based on plans and sharing of information
M30	VISUAL PPT	1200	VISUAL Power Point of damage photos	ALL	ALL	Continuous play of pictures to reinforce impacts
M31		1405	After shock 5.7	ALL - Script	ALL	Play stops, drop, cover and hold and reestablish play
M32		1413	5.7 Aftershock Shake Map delivered via email	UW Lab	ALL	
M33		1410 – 1600	Local play continues	Local Controllers		
M34		1520	After shock 4.6	UW Lab	ALL	FYI
M35		1600 – 1630	END EX Announced	ALL	ALL	Stop play

Appendix 4 – RPIN Messages

The exercise included a test of the Regional Public Information Network (RPIN). RPIN provides a quick and easily updatable E-mail message that can be used to distribute information to regional partners. A sample E-mail message is provided below.

From: info@RPIN.ORG
Sent:
To: RPIN-TEST@LISTS.RPIN.ORG
Subject: EXERCISE MESSAGE:

The Regional Public Information Network (RPIN) is a regional partnership hosted by King County. Content is solely the responsibility of contributing agencies. For questions about news releases, contact the issuing agency.

```
##### SOUND SHAKE EXERCISE ----- NOT A REAL EARTHQUAKE #####

.. EARTHQUAKE REPORT FROM ..
Pacific Northwest Seismograph Network
University of Washington
Seattle WA

A MAJOR EARTHQUAKE OCCURRED AT 7:54 AM PST March 5, 2008
THE MAGNITUDE 6.7 EVENT IS LOCATED 5.0 km S of Seattle, WA (1st & Yesler)
THE HYPOCENTRAL DEPTH IS 6.3 MILES

This earthquake has been reviewed by: amyw

PRINCIPAL EARTHQUAKE PARAMETERS
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Magnitude : 6.7
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Appendix 5 –Exercise Evaluation Form

Category	Objective
Communications	<p>Evaluate the ability of regional communication capabilities to facilitate interoperable communication links though out the region during response to a catastrophic earthquake.</p> <ul style="list-style-type: none"> • Communicated to Other EOC reps or Regional Partners on Regional Impact Issues • Communicated to Primary Partners through the 800 MHz System • Communicated to Primary Partners through WebEOC • Communicated to Primary Partners through Satellite Systems • Communicated to Primary Partners through Other Resources • The Region Demonstrated the Ability to Communicate Information Effectively Without the Use of Primary Systems (Phones)
Emergency Management interface	<p>Evaluate the ability of multiple EOC/ECC's to coordinate information, planning and response efforts during a catastrophic earthquake.</p> <ul style="list-style-type: none"> • EOC's were able to overcome infrastructure failures to active within the first 30 minutes post incident. • EOC's were able to transfer information between sites by use of redundant systems. • EOC's were able to obtain, share, and coordinate reports of impacts to create situational awareness regionally. • EOC's were able to produce media releases with a coordinated message.
Public information dissemination	<p>Evaluate the ability of the Joint Information System to rapidly and effectively disseminate public information and warnings in support of real time operations to the community.</p> <ul style="list-style-type: none"> • A JIS was established within 2 hours of the incident. • The JIS effectively coordinated messaging from local JIC's to create a single message to the public. • The JIS was able to produce messaging for dissemination to diverse/special needs populations regionally. • The JIS was able to produce messaging for dissemination to diverse/special needs populations locally. • The JIS partnered with media for support for information dissemination. • The JIS established a plan for use of alternate communication methods to reach the public. <p>The JIS was able to produce meaningful messaging and updated the information as necessary. The JIS was able to verify information and messaging to create a coordinated distribution of information.</p>

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

Category	Objective
Impact Reporting and Analysis	<p>Evaluate the ability to report and analyze information.</p> <ul style="list-style-type: none"> • Information gathering plans were utilized to quickly assess regional impacts. • Information gathered in the field or from key stakeholders was effectively communicated through the participating primary EOC's. • The EOC's utilized the information provided to establish an Incident Action Plan (IAP). • There was coordination of information to establish or initiate a regional impact assessment. • Regional impact assessment information reached the leadership level of participants in a clear and coordinated process.
Resource Allocation	<p>Evaluate the ability for emergency management to prioritize and allocate resources utilizing current capabilities following a catastrophic earthquake.</p> <ul style="list-style-type: none"> • Resource requests were prioritize to facilitate allocation decisions at the following levels: Locally. • Resource requests were prioritize to facilitate allocation decisions at the following levels: Regionally. • Resource requests were prioritize to facilitate allocation decisions at the following levels: State-wide. • Areas without major impact made resources available for allocation through a central point of coordination. • Resource requests were made to partners outside the impacted area within 4 hours of the incident. • Resource allocation decisions were made in a collaborative effort locally. • Resource allocation decisions were made in a collaborative effort regionally. • Resource allocation decisions were made in a collaborative effort state-wide.
Overall	<p>Evaluate overall exercise effectiveness.</p> <ul style="list-style-type: none"> • The coordination between partners was effective in facilitating response to the incident. • Partners initiated advanced planning and communicated needs to the appropriate EOC. • Situation Reports were shared between partner EOC's. • High level situational awareness was established by end of exercise play. • The participants demonstrated the ability to initiate a regional response to a widespread disaster.

Appendix 6 – HAZUS Map Samples

As part of the exercise, HAZUS maps were generated by the Pacific Northwest Seismic Network (PNSN) and U.S. Geological Survey (USGS) to project likely areas and types of damage caused by the earthquake. HAZUS is an abbreviation for Hazards United States and is a software package that estimates the losses generated by natural hazards. HAZUS (<http://www.hazus.org>) distributed by the Federal Emergency Management Agency (FEMA).

Several HAZUS map examples are provided on the following pages. The maps were generated by PNSN and the USGS and were distributed by the Washington State EOC to local cities and counties. This type of mapping technology can be extremely useful during a catastrophic disaster to aid jurisdictions in focusing their resources in areas where assistance is needed.

In order to make HAZUS more useful, serious consideration should be made towards taking the time to provide good data to allow for better HAZUS mapping. This can be more valuable than any exercise and more importantly be utilized before incidents (for mitigation purposes), during incidents (to estimate damage and anticipate where there is a need for different types of assistance), and after incidents (to provide justification for the prioritization of emergency funding expenditures). In addition, it is important to note that other mapping systems used can also benefit from increasing the quality of data. Exchanging information and interfacing different mapping and modeling systems will provide the foundation for future improvements.

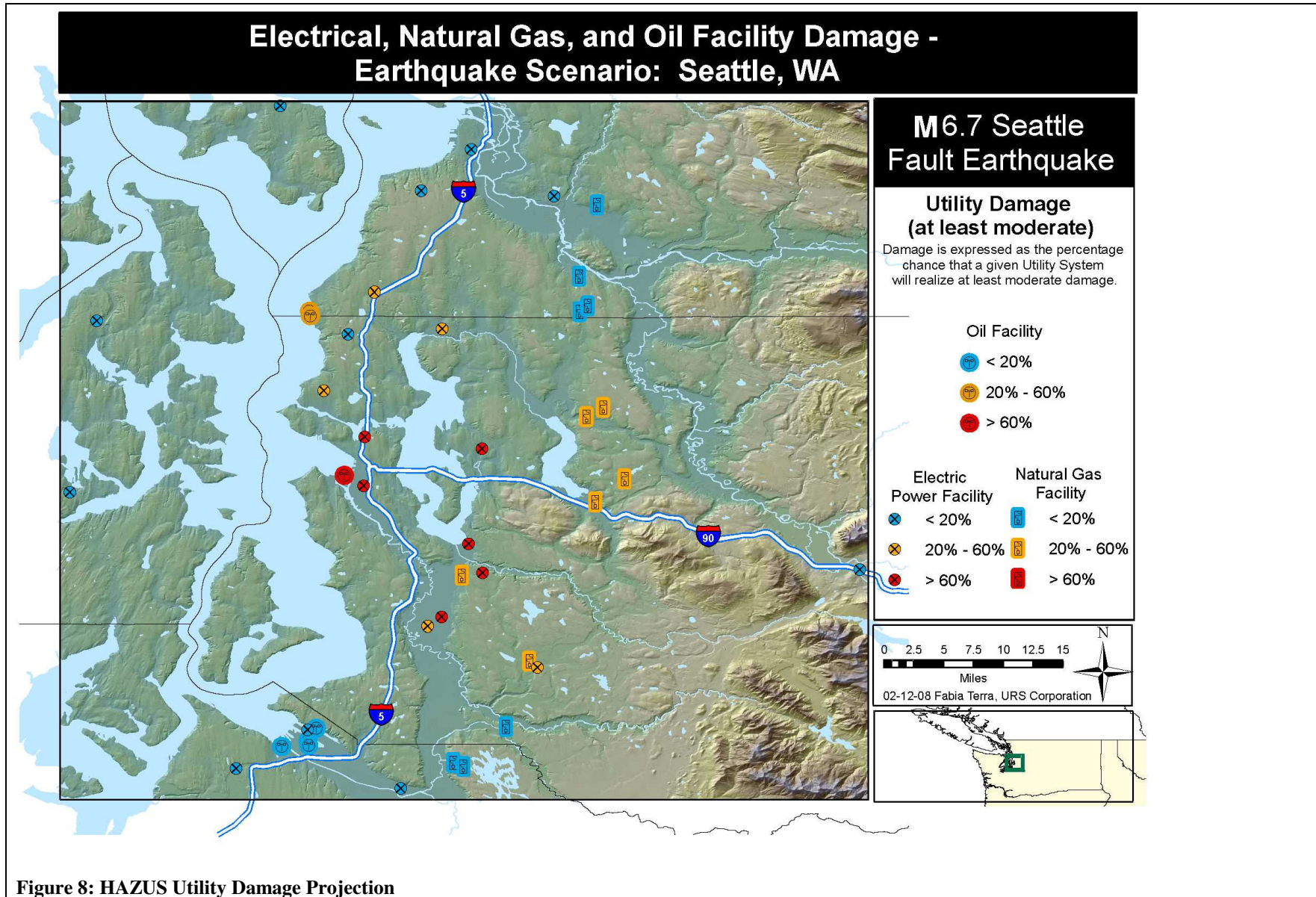


Figure 8: HAZUS Utility Damage Projection

Estimated Building Inspection Needs - Earthquake Scenario: Seattle, WA

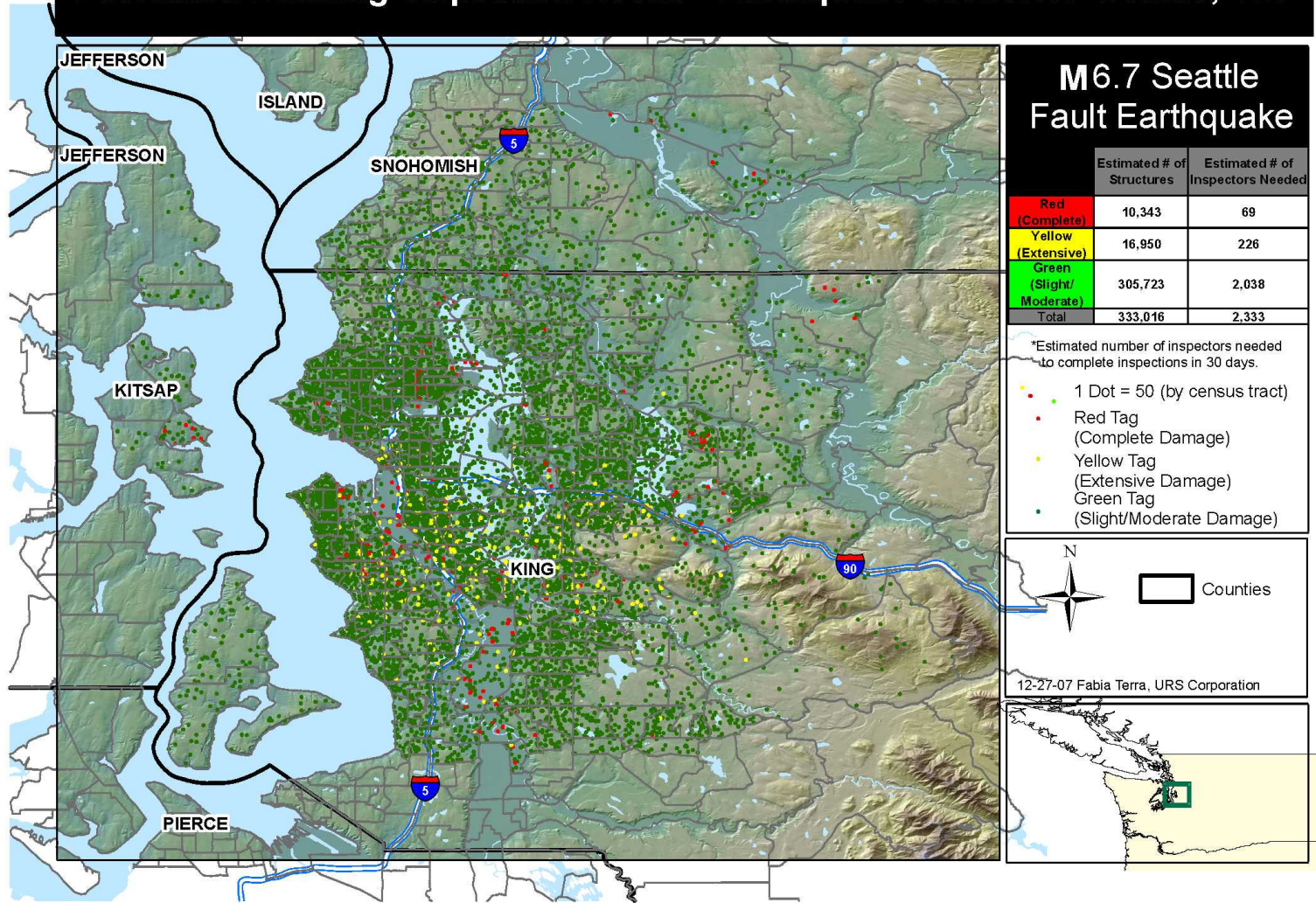


Figure 9: HAZUS Building Inspection Need Projection

Distribution of Elderly, Impaired Hospitals (Day 1), & Hospital Bed Availability - Earthquake Scenario: Seattle, WA

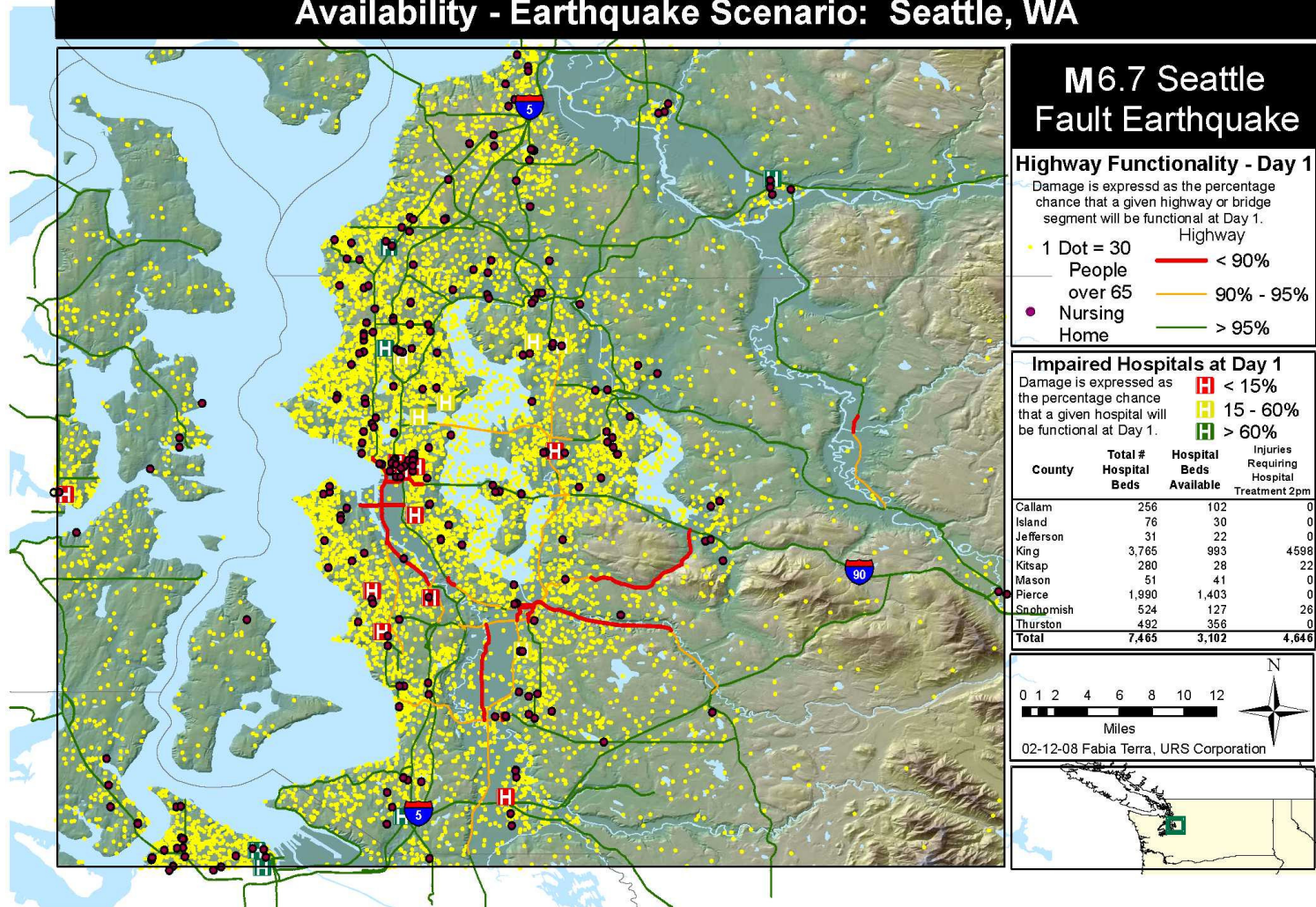


Figure 10: HAZUS Hospital Availability Projection

Appendix 7 –Evaluations by Location

The following tables and figures provide individual evaluation ratings for each of the following locations:

- King County ECC – including Policy Room, KC Government JIC, and ECC
- Snohomish County EOC
- City of Bellevue EOC
- City of Seattle EOC
- State of Washington EOC

King County ECC, Policy Room, and KC Government JIC

The King County Emergency Coordination Center (ECC) includes the Policy Room, KC Government JIC and County ECC. The ECC is comprised of the Points of Distribution (PODs) that manage key operations such as Planning, Communications, Logistics, and Finance. Note: the Regional JIC was not activated for this exercise by design since a Regional JIC would not likely be operational for the first few hours of an incident.

The following evaluation has been divided into three major sections. The Policy Room, the KC JIC, and the other functional components of the ECC (PODs). The table at the right provides a summary of the key categories evaluated.

King County ECC	ECC	Policy Room	JIC	Average
Communications	3.67	1.67	4.40	3.25
Emergency Management Interface	2.96	-	3.25	3.10
Impact Reporting and Analysis	3.02	1.80	4.00	2.94
Public Information Dissemination	3.81	-	2.13	2.97
Resource Allocation	2.63	2.00	3.00	2.54
Overall	2.53	2.00	3.00	2.51

While specific areas within the KC ECC performed satisfactorily, there remain gaps in performance as the overall score indicates. Consequently more work is needed to ensure operational effectiveness following a major catastrophic incident.

In particular the Policy Room needs additional operational planning, training, and exercises. Focus needs to be placed on strategic planning and coordination with other jurisdictions. Complete situational awareness cannot be achieved without a full understanding of the facts, issues, and the resources available as well as coordination with all involved groups. Likewise, while the KC Government JIC performed generally well, coordination with other city, county, and the state PIO's requires improvement.

Communication and coordination between King County and the City of Seattle continues to be a challenge. Technologically each jurisdiction has its own separate installation of WebEOC and culturally there is a distinct difference between how each organization

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

operates. Continued exercises, discussions, and dialog are needed to fill the gap and ensure that both entities work in unison particularly after a catastrophic incident.

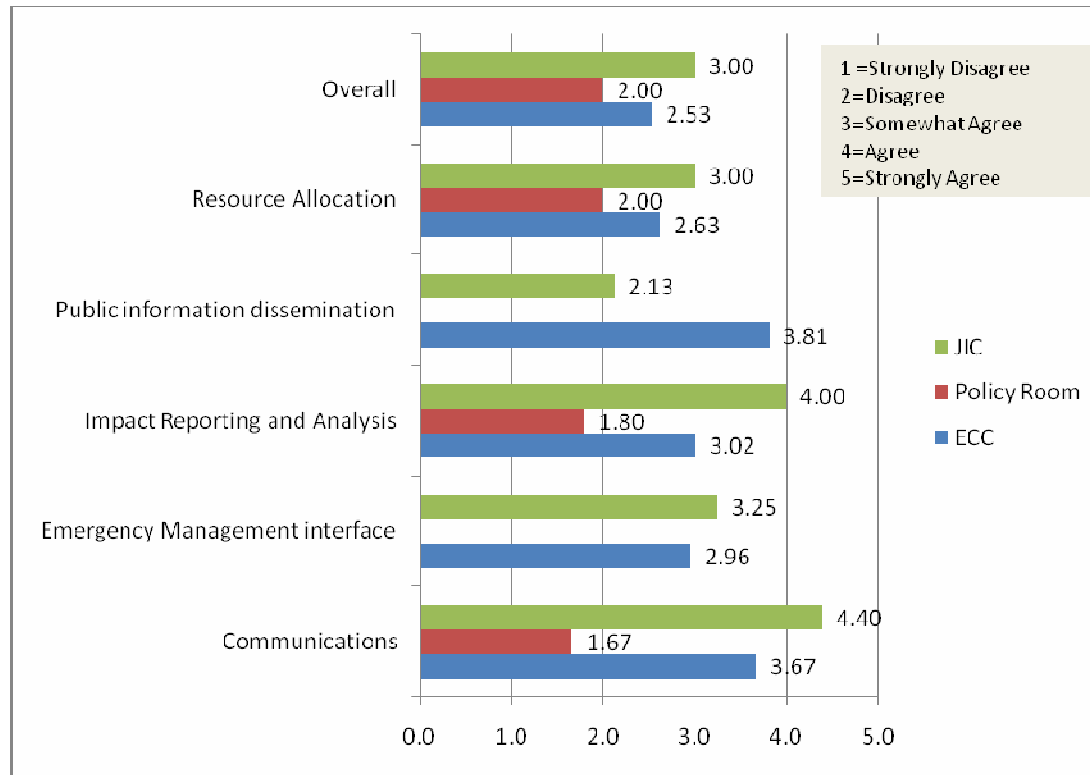


Figure 11: KC ECC, Policy Room, and KC JIC Evaluator Ratings

Despite the suggested improvements noted above, the County did perform well in several areas. Specifically, the 800 MHz radio system worked well as did the amateur radio network and the Communications group did an exceptional job as the main point of contact for radio injects and inter-jurisdictional communications. In addition all players took the exercise seriously and performed their tasks generally well under a realistically stressful situation.

Snohomish County EOC

Communications	2.89
Emergency Management Interface	2.21
Impact Reporting and Analysis	2.37
Public Information Dissemination	2.63
Resource Allocation	3.44
Overall	2.60

Overall the exercise was successful in that the Snohomish County EOC exhibited a high level of teamwork and cooperation and was able to think outside the box to address the situation. However, the exercise identified that Sno Co. EOC has improvement opportunities in the following areas. At 14:40 there was an aftershock and reports came in that casualties included 1,000 dead and 5,000 injured but the group continued to work on old issues and did not rapidly reassess priorities.

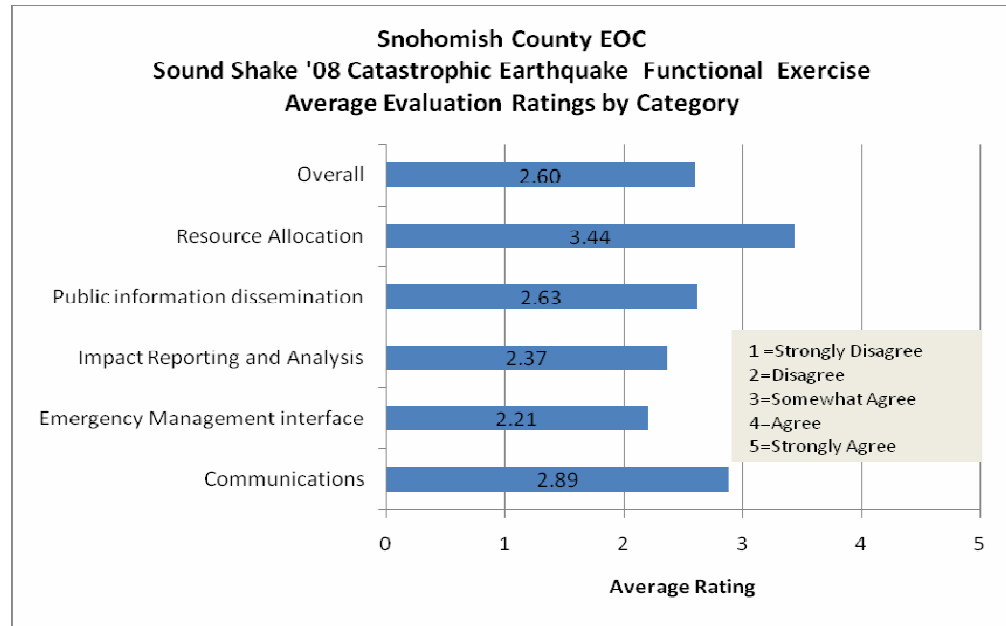


Figure 12: Snohomish County Evaluator Rating

The 800 MHz radio system worked although several issues were uncovered. For example, contact with the American Red Cross EOC was difficult due to a lack of 800 MHz radio training and the need to program the ARC radio properly. In addition there were computer set-up/WebEOC issues that need to be corrected before the next incident.

Coordination with cities needs to be improved. Although some contacts were made, complete situational awareness was not achieved. Coordination with King County and cities outside of Snohomish County also needs improvement. Proactively reaching out to areas of severe impact is required so that available resources can be dispatched where needed. More frequent communication County-to-County, County-to-City, County-to-State would help correct this issue. Similarly, the PIO did an excellent job but coordination with cities and other jurisdictions is needed. Finally, the use of WebEOC needs improvement and a focus placed on ensuring information is entered in terms of completeness and timeliness. During the exercise, data was entered into WebEOC only sporadically.

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

City of Bellevue EOC

Communications	3.17
Emergency Management Interface	2.50
Impact Reporting and Analysis	2.50
Public Information Dissemination	2.25
Resource Allocation	2.50
Overall	3.50

The City of Bellevue communicated effectively and did well overall, however additional work is needed. It is apparent that there are quite a few new EOC members among the players and some were uncertain of how to perform their roles. Also status boards are placed in the EOC but players did not use them for nearly an hour after the start of the exercise and protocols for their use were unclear.

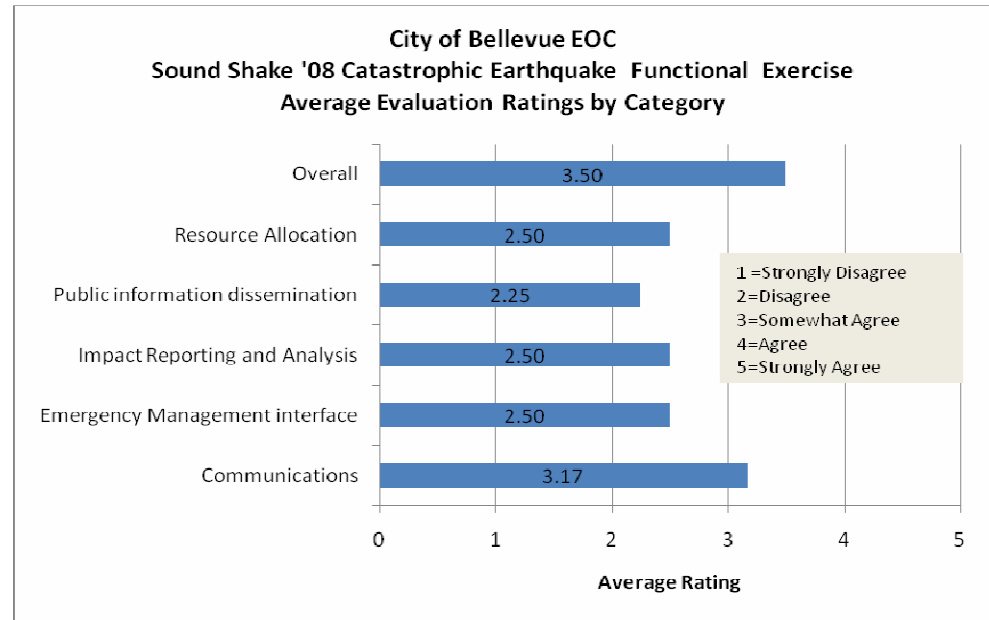


Figure 13: City of Bellevue Evaluator Rating

Additional training is required on the use of communications equipment. For example, some players were unsure of how to use the 800 MHz radio system. Also, during the exercise, amateur radio (EARS) operators were uncertain of frequencies to use. Evaluators also noted that several of PIO press releases were inaccurate. In addition, clarification on policies and procedures under emergency conditions are needed. For example, Finance stated that EOC members had spending authority over their areas, but the Policy group needed to define the “event”. Furthermore, Parks and Recreation did not have the authority to spend funds on shelters. Also State of Emergency Powers were not disseminated and were not well understood by the City Attorney representative. Training on internal communications is needed. In one case the EOC Commander did not know that the PIO had already sent out a water conservation notice. Finally several structural changes in the EOC could aid operations. For example, strongly consider placing Information Technology and Communications (EARS) closer to one another. Likewise, relocate the PIO and the Executive functions nearer to one another. Relocate the EOC Commander’s work area to a less central part of the EOC. This will allow the EOC Commander to monitor the EOC and its function without interfering with his/her duties.

**Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan**

City of Seattle EOC

Communications	3.00
Emergency Management interface	2.33
Impact Reporting and Analysis	2.00
Public information dissemination	2.00
Resource Allocation	2.63
Overall	2.00

Using the new City of Seattle EOC was an additional challenge over and above the exercise. Nevertheless, the technology at the EOC functioned well though continued training is needed. For example, some players were unfamiliar with operating the 800 MHz radio.

Further, while communication of issues between groups within the EOC is essential, multiple redundant briefings sometimes occurred - taking up resources and time that could have been better used in planning.

Communication and coordination between the City of Seattle and King County continues to be a challenge. Technologically each jurisdiction has its own separate installation of WebEOC and culturally there is a distinct difference between how each organization operates. Continued exercises, discussions, and dialog are needed to fill the gap and ensure that both entities work in unison particularly after a catastrophic incident.

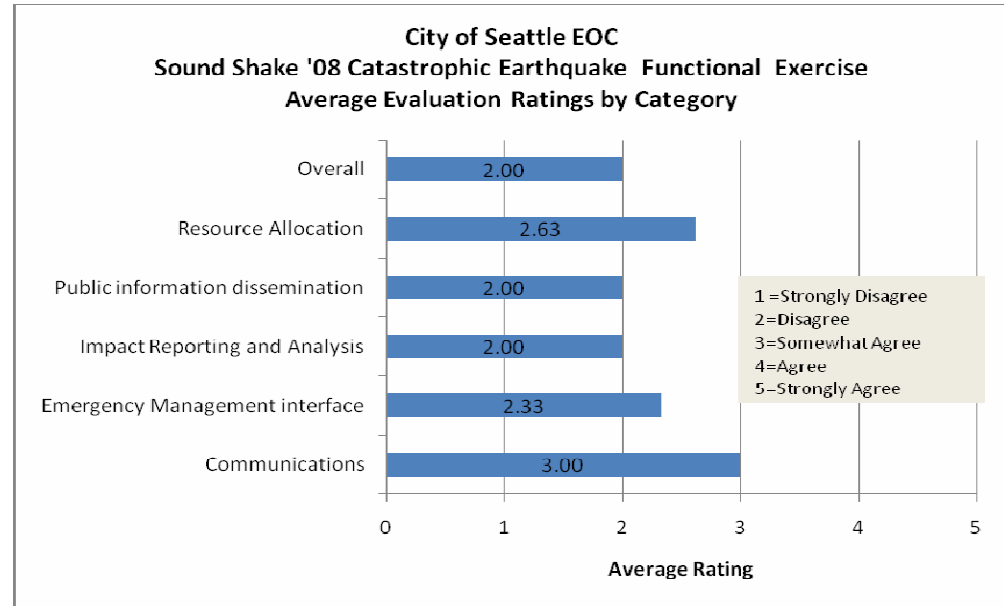


Figure 14: City of Seattle Evaluator Rating

State of Washington EOC

Communications	3.00
Emergency Management interface	2.13
Impact Reporting and Analysis	1.70
Public information dissemination	2.06
Resource Allocation	2.25
Overall ⁸	2.00

The main focus of the State Policy Room was on life safety and state support to local life safety response measures, as is appropriate during initial response operational periods. Concurrently, State EOC staff conducted planning that focused on strategic issues that local jurisdictions could not manage on their own (e.g. transportation and infrastructure support). It is recommended that the State Policy Room clearly identify current strategic issues that the State is addressing, and to direct appropriate EOC staff to conduct planning and coordination of strategic measures, including life safety support.

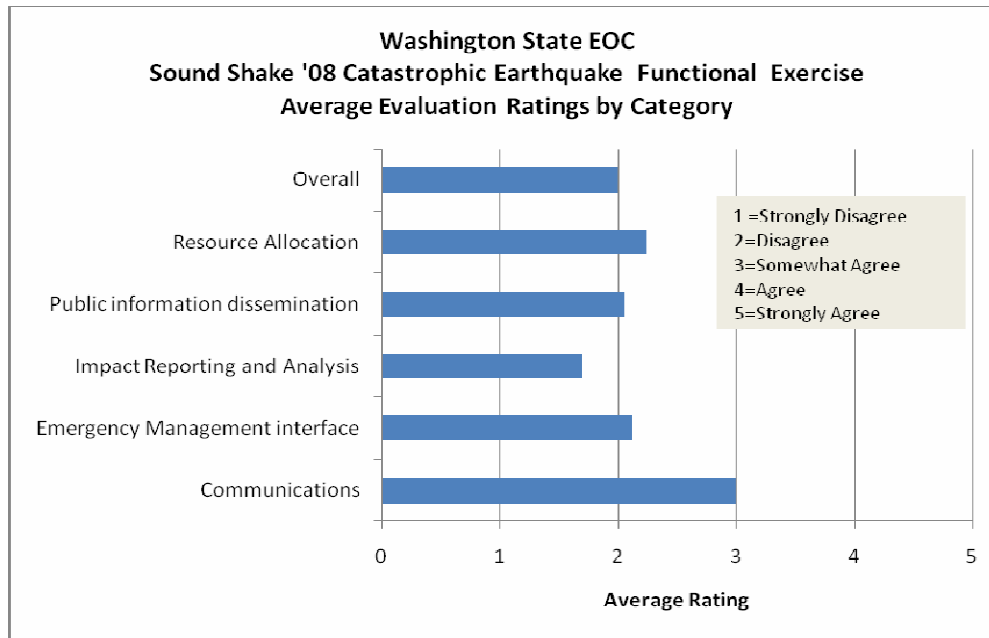


Figure 15: Washington State Evaluator Rating

Local responders will have the best information regarding local requirements (including life and safety issues) so requests for resources should flow up to the State who can then have a “big picture” view of the situation. Focus can then be placed on obtaining

⁸ WA State EOC Feedback by category can be found at the end of this section.

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

and coordinating large scale acquisition and movement of resources to areas of need.

Coordination between the state, counties, and cities requires improvement. While establishing alternate routes of communication was successful, i.e., 800 MHz radio and RACES actual coordination of activities was not always apparent. For example, the JIS was not implemented (though local jurisdictions including the State did manage public information issues within their groups).

Furthermore, WebEOC needs improvement. One issue is that WebEOC implementations are stand alone system so the State and King County WebEOC systems are not integrated. This may be an irresolvable technical issue but some type of workaround is needed to ensure coordination. Information was being updated in WebEOC but many participants did not view the information to keep themselves informed. In addition, the quality of data is sometimes lacking. Demonstrating the importance of including enough detail and definitive statements about task assignments, requests, priorities, and outcomes. Additionally, it was not clear how the various requests in WebEOC were being handled and prioritized. Examples included flyovers for Auburn and Snoqualmie Falls, a generator for Ballard Lock, Roosevelt High School requesting a helicopter to remove people from the roof, and a satellite trailer for the Tacoma EOC. Also WebEOC contained information about highway damage and bridge collapses but it was unclear if the Transportation POD was assigned the task of creating a map.

WA State EOC Feedback by category

Emergency Management Interface –

HAZUS was created and disseminated throughout the region. The State had the subject matter expertise and means to produce HAZUS products and used the HAZUS maps in the policy room: therefore creating regional situational awareness at the state level. Additionally, the State PIO created media releases, as well as establishment of an exercise disaster website on the EMD homepage and utilization of the Regional Public Information Network (RPIN), which assisted in the release of coordinated messages. It is recommended that the State develops a brief template or outline of what it expects the local jurisdiction to report when it conducts the daily statewide disaster conference call. The conference call is an excellent means for the State to gain awareness.

Impact Reporting and Analysis Gathering –

The scenario (initial response) limited the amount of known damage and casualties. Of those jurisdictions that played actual roles during the Sound Shake '08 Functional Exercise, the State EOC received Situation Reports from the City of Renton, City of Shoreline, Thurston County and Snohomish County, Additionally,

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

through redundant communication systems the State EOC was able to maintain communication with City of Seattle, City of Bellevue, King County and Snohomish County.

Public Information Dissemination -

The State would concur that the interagency coordination was not very robust. However it is important to point out that the State does a tremendous amount of communication through the internet, websites, distributions lists and regional networks. This might have been overlooked by the evaluation team.

Resource Allocation -

Sound Shake '08 was a response exercise focused on the first 8 hours of an incident. The State Policy Room

S sole focus was on life safety and strategic impacts of a catastrophic earthquake. Again, not readily apparent to the evaluation team, concurrent coordination was occurring on the State EOC Floor. Logistics section coordinated for all Federal Type 1 Search and Rescue Teams, provided the information to local jurisdictions on state push packs for first responders, and prepared logistics requests for future operations. Requests were made for 96 hours out. WA State Department of Health coordinated for future beds space availability and assisted in the coordination of EMS support, including the transfer of patients throughout Washington State, other states and to Canada.

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

Index

800 MHz	1, 3, 10, 14, 15, 22, 27, 29, 33, 43, 54, 59, 67, 68, 69, 70, 71
ACS	50
Advanced National Seismic System	32, 35
Alaska Airlines	49
Amateur radio	10, 22, 28, 29, 30, 33, 39, 43, 67, 69
American Red Cross	8, 33, 43, 68
Amgen	8, 49
Amgen, Inc.	8
Animal sheltering	34
ANSS	32
ARC	68
Arlington	9
Auburn	9, 55, 72
Bellevue	i, 1, 2, 5, 6, 8, 48, 51, 52, 54, 55, 57, 65, 69
BELO	8
Bentall Capital	8
Boeing	8, 54
Boeing Radio Team	9
Bothell	9
Burien	9
Burien FD	48
California Integrated Seismic Network	32, 35
Canadian Consulate	8
Canadian National Exercise Division	8
Capital Regional District	8
CIIM	32, 35, 41, 44
CISN	32, 35, 41, 44
City of Bellevue EM	48
Community Internet Intensity Map	32, 35, 44
Community Transit	8
Controllers	7, 27, 56
Covington	9
Des Moines	9
DHS	1, 5, 8, 14
DOT	55
EARS	69
Eastside Fire and Rescue	9
ECC3	5, 13, 15, 17, 18, 19, 23, 28, 29, 30, 31, 32, 33, 34, 38, 39, 40, 41, 43, 44, 46, 48, 54, 59, 65, 66, 67
Emergency Coordination Center	5, 66
Emergency Management Division	6, 8, 11, 32
Emergency Operations Center	5
Emergency Support Functions	31, 41
Environmental Protection Agency	8
EOC3	5, 7, 9, 13, 15, 17, 18, 19, 20, 23, 25, 28, 29, 30, 31, 32, 33, 34, 36, 38, 39, 40, 41, 43, 44, 46, 48, 49, 50, 53, 54, 55, 59, 60,

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

61, 65, 68, 69, 70, 71, 72	KC DOT.....	48, 49
EPA.....	KC FD #13.....	9
ESF.....	KC FD #27.....	9
ESFR.....	KC FD #40 Radio Team.....	9
ESFR Radio Team.....	KC FD #44.....	9
Evaluators.....	KC OEM.....	48, 49
Exercise Evaluation Form.....	Kent.....	9, 55
FEMA.....	King County.....	i, ii, 1, 2, 5, 6, 9, 25, 48, 51, 54, 57, 65, 66, 68, 70, 71
FTP.....	Kirkland.....	9, 57
GIS.....	KIRO.....	8
Goldbar.....	Language translators.....	34
Governor Gregoire.....	Marysville.....	9
Hazardous materials.....	Master Control Cell.....	10, 48
HazMat.....	Master Scenario Events List.....	6, 53
HAZUS.....	Medical Services Team.....	9
Health Care Coalition.....	Medina PD.....	48
Hearing impaired.....	Mercer Island.....	9
Homeland Security.....	MLC & Associates, Inc.....	ii, 6, 48, 49, 50
IBRD.....	Monroe.....	9, 72
Information Technology and Communications.....	MSEL.....	6, 12, 22, 23, 24, 25, 26, 53
Issaquah.....	National Incident Management System.....	14, 31, 41
Jackson International, Inc.....	NIMS.....	14, 31, 32, 35, 41, 42, 44
JIC.....	Nisqually.....	11
JIS.....	Normandy Park.....	9
Joint Information System.....	Northshore Utility District.....	9
KC DES.....	Observers.....	7, 8, 27

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

Office of Emergency Management.....	ii, 6, 51, 52	SeaTac	9, 29, 54, 55, 56
Pacific Northwest Seismic Network.....	32, 61	Seattlei, ii, 1, 2, 5, 6, 8, 11, 36, 48, 49, 51, 52, 53, 54, 55, 56, 57, 65, 66, 70	
Paine Field Fire	50	Seattle City Light	8
Parks and Sheltering-Bellevue	48	Seattle Community Colleges	8
PCCS, Inc.....	8	Seattle Fault	5, 11, 51, 52
Pemco Insurance	8	Seattle University.....	8
PIO/IT-Bellevue	48	SFD	49
Players.....	7, 27, 33	ShakeCast.....	32, 41
PNSN	8, 32, 41, 61	ShakeMap	32, 35, 41, 44
Port of Seattle.....	8	Shoreline	9
Premera Blue Cross.....	50	Sno Co.....	68
Provincial Emergency Management British Columbia	8	Snohomish County	i, 1, 2, 5, 6, 9, 48, 50, 51, 65, 68
PSE – Amateur Radio Team.....	9	Snohomish County DEM	50
Puget Sound Energy	8	Snohomish County EMD	50
RACES	1, 15, 22, 71	Snohomish County Emergency Management.....	9
Radio Amateur Civil Emergency Service	15	Snohomish Police.....	50
Redmond.....	9	Snoqualmie Falls.....	72
Regional hot wash.....	1	Snoqualmie Indian Tribe	9
regional partners	2, 7, 8, 19, 29, 33, 47, 57	SPD	48, 49
Renton.....	ii, 9, 55	Special needs	4, 16, 25, 34, 59
Renton Radio Team	9	SPIO.....	49
Richmond	8	SPU	49
RPIN.....	15, 30, 39, 57	Standard Operating Procedures.....	32, 42
Safeco Insurance	8	State of Emergency.....	69
Sammamish Plateau Water and Sewer	9	State of Washington.....	i, 1, 2, 6, 8, 12, 22, 26, 51, 52, 65, 71
SDOT	49		

Homeland Security Exercise and Evaluation Program
Seattle UASI and Regional Partners Sound Shake '08 Functional Catastrophic Earthquake Exercise After Action Report/Improvement Plan

State of Washington Emergency Management Division.....	6	US Coast Guard.....	8
Sultan School District.....	9	US Dept of Health and Human Services.....	8
Symetra Financial.....	8	Vancouver.....	8
Tacoma.....	50, 72	Vashon Be Prepared.....	9
Tacoma Fire.....	9	Vashon Island Radio Team.....	9
Tacoma Police.....	9	ViPR.....	10, 15, 20, 25, 33
Tactical Interoperable Communications Plan.....	3, 14, 22	Volunteers of America.....	9
TICP.....	3, 14, 22	WA State EM.....	50
T-Mobile.....	8	WaMU Radio Team.....	9
Transportation-Bellevue.....	48	Washington Mutual.....	8
Tukwila.....	48, 49	Washington State.....	1, 5, 19, 32, 61, 71
Tukwila Fire.....	49	Washington State HLS Region 3.....	9
U of W Radio Team.....	9	WebEOC1, 3, 5, 14, 15, 19, 20, 21, 23, 27, 28, 29, 31, 34, 35, 36, 37, 39, 43, 44, 45, 46, 55, 59, 66, 68, 70, 71	
UASI.....	i, ii, 1, 2, 3, 5, 13	Winlink.....	30, 39
Unigard Insurance.....	8	Woodinville.....	9
United Way.....	48	Woodinville Fire.....	48
University of Washington.....	8, 57		
Urban Areas Security Initiative.....	1		