Damage Assessment for CERTs

Introduction

National and local governments throughout the world are required by their laws to respond to disasters which occur within their jurisdictional boundaries and to provide relief for their affected citizens as best they can. When a disaster strikes, immediate government objectives are to provide for the health and welfare of the affected public. This usually involves the feeding and sheltering of displaced citizens, search and rescue operations, and medical care of injury victims. As time goes on, the secondary objectives become the restoration of utilities, reconstruction of housing and a "return to normalcy" as is sometimes said.

As a CERT trained citizen, you know that many government agencies take up to 72 hours before resources can begin arriving in the affected areas. In fact, many disasters are of such size and scope that much more time is needed to really have noticeable effects, sometimes as much as two weeks. The United States Government has an intricate web of agencies and organizations that it relies upon to implement a complicated process of responding to disasters. Community Emergency Response Teams are considered the first responders by the U. S. Government, and since they are already trained and organized, can usually respond within the first couple hours. The information gathered and reported by CERTs in the first days of a disaster is vital to the Government's response and relief efforts.

Damage assessment is a necessary function of CERTs for many reasons. First, and foremost, assessment of damage gives your team the ability to safely plan and execute your activities. Secondly, this knowledge allows you to concentrate your limited resources in areas of the community where they are most needed. Finally, the reports you make to government agencies allows them to allocate their resources to save the most lives and protect the most property while simultaneously activating the disaster declaration process.

You may have wondered how news agencies get their billion dollar damage estimates into their breaking news stories so quickly after a disaster. You may also notice that those estimates are usually incredibly huge and are later revised downward. These observations are due to the damage assessment process and the assumptions made to derive dollar estimates. This process is continuous, usually extends beyond the life of the response and relief efforts and always begins with you (the first responders) in the first hours after a disaster.

This paper is intended to give CERT trained Citizens a basic knowledge and understanding of the first phases of assessing damages. It will provide some definitions of terms, discuss the disaster declaration process, discuss the legal issues and preplanning by CERTs for Preliminary Damage Assessments (PDAs), and will present the general policies and procedures that CERTs should follow when performing PDAs. This paper is not intended to make anyone into an engineer or other certified or licensed professional. If your team happens to have one of these professionals as a member however, you should make use of their training and skills to make preliminary reports more accurate. Lets begin with some terms and definitions.

Section 1 - Terms and Definitions

(As used in this paper and related to damage assessment)

FEMA:	Federal Emergency Management Agency, responsible for the overall disaster preparedness, response and relief programs of the United States.
USACOE:	United States Army Corps of Engineers, responsible for damage assessments of federal facilities such as dams and roads. The acronym is sometimes shortened to COE.
SAR:	Search and Rescue team
SBA:	Small Business Administration, responsible for economic recovery by providing loans to affected businesses to rebuild.
CERT(s) / ERT(s):	Community or other Emergency Response Team(s), Citizens, Professionals, Groups or Organizations that respond to disasters and emergencies.
EM(s):	Emergency Manager(s), individuals usually assigned by governments that plan for and coordinate response to disasters and emergencies.
EOC(s):	Emergency Operations Center(s), locations where civil and military EMs coordinate government response and relief efforts. Each level of government usually establishes their own EOC forming a chain of command from local communities to national government.
Damage Assessment:	The process wherein a monetary figure is attached to the physical damages resulting from a disaster or emergency.
Destroyed:	FEMA Category where an item or building is a ***total loss*** or is damaged to the extent that it is not usable and ***not economically*** repairable.
Major:	FEMA Category where an item or building is damaged to the extent that it is ***no longer usable*** and may be returned to service only with ***extensive*** repairs.
Minor:	FEMA Category where an item or building is damaged and ***may only be used under limited conditions***, but may be restored with ***minor*** repairs.
Affected habitable:	FEMA Category where a building ***has some*** damage to the ***structure*** and suspected damage to ***contents***. Structure ***is usable without*** repairs.
Disaster:	Any event that suddenly overwhelms government or local resources and the ability to respond.

Section 2 - Disaster Declaration Process

Typically, a Local Community's Police and Fire Departments will respond to disasters by "sizing up" the situation. If the situation is such that the department believes activation of the Local Community's EOC is warranted, elected officials and local EMs will be called in. If the Local EOC determines that their resources are insufficient for the task, the elected officials will call upon the next higher level of government and neighboring communities for assistance.

In the United States, the next level of government is the County. If the disaster is of a size and scope as to overwhelm the County EOC, then the State EOC is activated. When the State's Governor has been briefed, he or she will request Federal assistance from FEMA if the State can not adequately respond. When FEMA has reviewed the Governor's request, FEMA will approach the White House and ask for a Presidential Major Disaster or Emergency Declaration.

When the President declares a disaster in a catastrophic disaster, federal resources are mobilized through FEMA for search and rescue, electrical power, food, water, shelter and other basic human needs. A Governor's request for a major disaster declaration could mean an infusion of federal funds, but the Governor must also commit significant state funds and resources for recovery efforts. A Major Disaster could result from hurricanes, earthquakes, floods, tornados or major fires which the President determines warrants supplemental federal aid.

The event must be clearly more than state or local governments can handle alone. If declared, funding comes from the President's Disaster Relief Fund, which is managed by FEMA, and disaster aid programs of other participating federal agencies. A Presidential Major Disaster Declaration puts into motion long-term federal recovery programs, some of which are matched by state programs, and designed to help disaster victims, businesses and public entities.

An Emergency Declaration is more limited in scope and without the long-term federal recovery programs of a Major Disaster Declaration. Generally, federal assistance and funding are provided to meet a specific emergency need or to help prevent a major disaster from occurring. A Major Disaster Declaration usually follows these steps:

1. Local Government Responds, supplemented by neighboring communities and volunteer organizations. If overwhelmed, turn to the state for assistance;
2. The State Responds with state resources, such as the National Guard and state agencies;
3. Damage Assessment by local, state, federal, and volunteer organizations determines losses and recovery needs;
4. A Major Disaster Declaration is requested by the governor, based on the damage assessment, and an agreement to commit state funds and resources to the long-term recovery;
5. FEMA Evaluates the request and recommends action to the White House based on the disaster, the local community and the state's ability to recover;
6. The President approves the request or FEMA informs the governor it has been denied. This decision process could take a few hours or several weeks depending on the nature of the disaster.

Section 3 - Legal Issues and Preplanning for PDAs

Legal Issues

Most people affected by a major disaster will be relieved to know that someone else is working on the disaster declaration process and gathering all the necessary information. There are, however, a number of people that wish no information about them be released to any government agency. As a CERT representative, you must understand what information can be released to people outside your organization.

Good Samaritan or not, you and your team might be sued if you release "personal" information about a disaster victim. For simplicity, there are two categories of information that your team will deal with during a disaster or emergency. These are Public and Confidential information.

Public information is any information that can be found relatively easily in public records. Examples of this are: the number, estimated value and addresses of residential or commercial structures in your neighborhood; utilities serving you neighborhood; the "number of souls" or people that occupy the structure regularly; public and government facilities in and around your team's service area; and the type and location of special health and safety hazards within the neighborhood. Since your team has developed and published your response plan, information about your sheltering, medical treatment, morgue, incident command center, staging area and equipment cache locations are also considered public information.

Confidential information is all personal or private information that can not be easily found in public records. Examples of this are: names, ages, telephone numbers and chronic health conditions of individuals; any information related to an individual's immigration status, insurance coverages or personal belongings; and any other information that can tie an individual to a specific set of public information. As for your team, this category is applied to such information as team rosters, cache inventories and the like.

Unfortunately, discrimination still exists in this world. As a CERT representative, you must extend the same level of service to every person affected by disaster. In the United States, there is a dizzying array of rules, regulations and laws to prevent discrimination and you could never learn all of them. When you canvas your community for information you need to preplan your teams response, you must take time to classify the data you've collected. A "rule of thumb" for releasing information to other agencies and organizations is "Never tie an individual to the data being released. Let the other agency or organization collect personal data for themselves."

Certain information should never be gathered by a CERT for team preplanning. Any data concerning ethnicity, national origin, sexual preferences or religious preferences is inherently prejudiced and can lead to unconscious discrimination on the part of any disaster worker. This data should never be recorded and should only be asked by medical professionals at the time of emergency medical treatment in the interests of responder safety and religious rights of the patient. Certain communicable diseases and ethnic or religious traditions may compel your Chaplin or medical treatment personnel to ask these questions. If your medical team follows accepted treatment protocols, then only your team Chaplin should ask questions about religious preferences.

Preplanning for Preliminary Damage Assessments

Your team must develop a written response plan in order to respond effectively to any emergency or disaster. Much information is needed to prepare this plan and the easiest way to collect it is to hold a team drill. Gather your team, complete with CERT apparel, neighborhood maps, notepads, pencils and picture identification if possible, and send them out into the neighborhood in groups of two.

Each group should "interview" the head of household at every residence and the manager of each business in the team's service area. Write one page for each address you visit. Do not ask personal questions since this may raise safety and security concerns for the family or business. Do ask general questions such as:

1. Maximum number of residents or employees in the structure at peak times of the day;
2. Location of shutoff valves for gas, water and electric utilities (mark these on the maps);
3. If the structure is insured (do not ask insurance company name or specific coverages);
4. If the family or business has an evacuation and response plan (no specifics though);
5. If the family or business has 72 hour kits;
6. If family members or business employees have special skills to lend your team in the event of a major disaster;
7. If family members or business employees have been CERT trained (if yes, ask if they wish to join your team. If no, ask if they wish to get training and join your team.);
8. If there are any special hazards inside or outside the structure such as propane tanks, wells or hazardous materials that may pose a safety or health risk to disaster workers;
9. If the family or business wants your team's help after a major disaster or emergency event. (This gives the opportunity to decline assistance for religious or other reasons. Do not ask why if they decline assistance. It also protects you and your team from criminal trespass and other charges or law suits.)

Notice that all these questions are general in nature. Provided the answers are equally general, all this information could be classified as public. If, however, you receive detailed information you will need to classify those answers as confidential. These are but a few questions you want to ask when planning your team's response. Now that you have at least this information, you are ready to write your team's response plan.

Preliminary damage assessment is your team's method of "sizing up the situation." The PDA process also allows you to report more accurate estimates to your local EOC which enables the disaster declaration process. It also allows your Team Leader to concentrate team resources in areas where the most good for the most people can be realized, and, allows fellow team members to determine risk when performing search and rescue (SAR) and fire suppression duties.

Each team should prepare a damage assessment form and checklist as part of their standard operating procedures (SOPs). You should collect other information and do some research before writing the plan. Information such as average costs and worker hours to repair utilities and bridges can lead to even more accurate reports.

Section 4 - Policies and Procedures for Damage Assessment

Policies and Objectives

There are two objectives for any Damage Assessment (DA) Unit. The primary objective is to survey the affected area, record findings and report to the Team Leader so that he or she can determine where to safely deploy the team's Fire Suppression and SAR units. The secondary objective is to prevent further damage and loss of life by turning off utilities, extinguishing small fires and requesting Fire Suppression and SAR units when necessary.

DA Units should not consist of less than two people. Always use the "buddy system" and try not to loose sight of your partner. Never enter any structure to assess damage, this is a detailed assessment and is the job of engineers and insurance adjustors.

Stay on mission! Your job is to quickly assess damages so the rest of your CERT can respond safely. It is difficult to resist the urge to help victims, especially when you hear pleas for help or screams from children and infants. Remember that your duties are critical to the Team's effort. Make notes in your assessment logs if you hear these pleas, but, keep moving! You will return to render aid soon enough.

Fire Suppression Units may be assigned to perform damage assessment, but, you must not spend too much time fighting a fire. DA Units have three duties. Assess damages, turn off as many utilities as possible, and, extinguish small fires. You must remember that, even though the structure may be destroyed, these are still private properties! Try to respect the property owner's rights for each site you visit.

You are part of a rescue team, not law enforcement! If you see a crime in progress, or find evidence of a crime, report it to your Team Leader immediately. Do not attempt to enforce the law since this will hinder your mission and waste valuable time. Attempting to enforce the law may put you and your partner at risk of your lives. Besides, your training does not usually include law enforcement techniques and your victims may hesitate to give vital information to you if they see you as law enforcement.

You must always carry identification when performing your DA duties. Law Enforcement Officials may stop you to check for looters. Your ID may prevent your being detained and allow you to complete your mission. Most CERT trainees are issued safety equipment when they graduate from the class. If possible, always wear your helmet, vest, gloves and safety glasses or goggles. Remember that victims can not help victims, so, don't become a victim yourself!

News agencies will often pay money for exclusive photographs or interviews. They may also request that their people be allowed to ride along with your field units. We suggest here that your team would ***not*** want either of these situations because your team is opened to serious liability issues concerning privacy and injury. Also, your mission does not allow you to waste time waiting for interviews to be completed, or for a photographer to set up the perfect heart wrenching snapshot. Understand that if you accept money for photos your team has gathered or if you permit untrained personnel to accompany your field units, you and your team may be held liable for the consequences of these actions.

In addition to personal safety gear, DA Units must have certain equipment and tools. Each unit should have at least one adjustable "crescent" wrench, standard and star blade screw driver, hammer, fire extinguisher, flashlight and 2-way radio. They must also have a note pad or clipboard with blank assessment forms and a pencil. We will now discuss the two methods of performing PDAs for CERTs, the "windshield survey" and the "walking survey."

Windshield Surveys

Perhaps the easiest and fastest method of performing PDAs is the "Windshield Survey." This method utilizes automobiles, preferably, 4-wheel drive vehicles with mobile 2-way radios (FSR's - family service radios). This method can be employed in areas where ever roads are passable and serves well in rural and suburban areas.

The procedure is simple, but usually requires three to four people. The driver simply stops at each site to be assessed. While the two or three other unit members exit the vehicle to fight small fires and turn off utilities (buddy system), the driver observes damages through the windshield and begins making notes and completing the assessment form. The Driver also watches the unit members outside the vehicle and observes road conditions ahead along the planned route.

When the unit members return to the vehicle, they give the driver a briefing of their observations so the driver can complete the notations. The driver also checks the level of fire extinguishers and insures no equipment is left behind. If necessary, the unit returns to the cache to get full extinguishers.

The driver is the unit leader and must insure that local laws are followed and that property owner rights are respected. The driver must also insure the safety of both the vehicle and fellow members of the DA Unit, and, plan the routes so that the PDA can be completed in the shortest possible time.

If your team has a camera available, it may be wise to make a photographic record of your tour. You can use these pictures for future training and public relations work for your team. Do not release these photographs to any outside organizations except the Civil Authorities or as provided by copyright laws. Doing so may adversely affect property owner or victim rights to privacy.

If a large area is inaccessible to vehicles, you should perform a "walking survey" as described in the next paragraphs. Park and lock your vehicle at the edge of the inaccessible area. Take all your portable equipment and tools. If you have a hand held transceiver, take that too. When you have finished the PDA for this area, return to you vehicle, plan a new route around the area and notify your Team Leader. Again we stress, stay on mission and always think safety!

Communications between your unit and the team command center is very important. Always notify your Team Leader when you are in or out of radio contact. Check in with your Team Communicator every half or quarter hour and transmit only urgent messages. Always give an approximate or exact location when notifying your base that your unit will be out of radio contact as well as how long your unit will be out of service. Remember, your team can not help you if they don't know where you are!

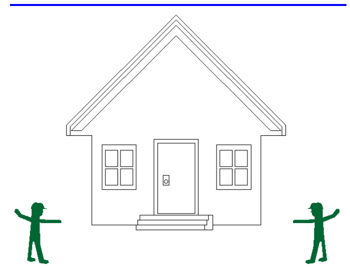
When using radios, avoid using 10 codes or other confusing codes. Speak in a natural manner and use plain language. Do not transmit sensitive or personal data.

Walking Surveys

Though more time consuming, the "Walking Survey" method is just as easy as the windshield survey. It is best suited for terrain where vehicles can not be used due to obstructions or unstable soils. It will also test the strength and endurance of unit members, especially during inclement weather. For this reason, unit members must be of reasonable physical condition.

There should be two members for each DA unit. The Team Leader must designate the area to be assessed on a detailed map. One member records notes while the second member turns off gas, electric and water utilities. Both unit members always use the buddy system and never loose visual contact with their partner.

As the unit approaches a structure, they begin to "size up" the situation. "Stop" at least twenty feet (6 meters) from one corner of the structure. "Look" at the structure's exterior condition and note any immediate hazards such as collapsed roofs, porches or walls and the presence of smoke. "Listen" for escaping gas, arcing electrical wires, crackling fires, running water and human sounds like cries for help. If no immediate threat to your unit's safety is noted, send one person to locate the utility boxes and shut them off. The recorder should always remain at least twenty feet from the structure while the second observer shuts off utilities.



Stop, Look & Listen

If you can not locate the utility boxes, the recorder should remain at the first corner watching for hazards while the second observer walks to the opposite corner maintaining their distance from the structure. The second observer calls their observations to the recorder and waits for the recorder to walk to the observer's position. The second observer then moves to the rear corner of the structure and calls observations to the recorder. When the utility boxes are found, the second observer waits for the recorder before moving to shut off utilities.

If you find injured or trapped victims, radio your Team Leader and ask for medical or SAR units. Only perform first aid or extrication if needed to save a life or if specialized equipment is not required. Remember, your time is limited and there are usually other units close by to do these jobs.

Tips & Tricks - How to Estimate and Use Data

The whole point of the PDA is to plan your response safely and notify the EOCs of your community's needs. Obviously, knowing which buildings are destroyed allows you to concentrate your SAR Units in areas where they can save the most lives. In areas where little or no damage has occurred, it is likely that few people are at risk of their lives. Many people may be in immanent risk of life in moderate and destroyed areas. You must use judgement here because committing all your resources at the 14 story hotel that "pancaked" means the family of four, three houses down the road, may die trapped in the basement of a burning building. Enough pep talk. On to the tips and tricks.

Instruct DA Units to call out in loud voices, "RESCUE TEAM! IS ANYBODY HURT IN HERE?". If there is an affirmative reply, then ask them to come out of the building. If the victims are ambulatory, give them directions to the central meeting area, and move on.

If the victims can not come out on their own, then make a judgement call. If the DA Unit can effect a rescue quickly and safely, then attempt it. Otherwise, tell victims that another unit with better equipment will be here soon, radio the location to SAR Units, and move on. This simple task could dramatically reduce the work load on the SAR Units.

When the DA Units return with their data, plot it on the Team Leader's maps. This will give a visual quick reference to the worst affected areas. Team resources can then be deployed to areas where more extensive SAR is needed. Plotting the location of small fires extinguished by the DA Units also allows you to watch for rekindling fires. Other data may point to available resources like trucks and water sources.

Debrief each DA Unit member asking what they smelled or heard during the tour. It is possible that people being debriefed may recall something important that they thought insignificant at the time. Most DA personnel will dutifully record what they see, but, may ignore offensive smells. Hydrogen Sulfide (rotten eggs) may indicate a Hazardous Materials (HAZMAT) response. Use your knowledge of hazards (gained during your preplanning surveys) to ask questions which may trigger recall of an odor, sight or sound. A green cloud near a chlorine tank may have been missed by the unit leader. Take about five minutes to debrief each of your DA Unit members.

While Debriefing, have one team member tally the data from the logs. Technically, only buildings in the "Affected but Habitable" category should be occupied. It is possible that minor damage structures may also be habitable. When the count of major damage and destroyed structures is complete, you will be able to determine how many people have to be sheltered. Furthermore, if you checked with your local realty companies during your preplanning, you will be able to apply that data to your count and prepare your reports to the EOC.

When estimating damages, use the average value of homes in your neighborhood and apply 100% to "Destroyed", 66% to "Major", 30% to "Minor" and 5% to "Affected but Habitable" categories. For storm drain, water and gas main breaks, use an estimate of $1500.00 per break. For sanitary sewers use $2000.00 per break. For downed power, telephone and other overhead lines use an estimate of $500.00 per incident. If you have quotes available from utility companies, use those instead of these estimates.

The definition of "destroyed" according to FEMA is where an item or building is a ***total loss*** or is damaged to the extent that **it is not usable and *not economically* repairable**. Examples of this would be collapsed or burning structures. Some structures may appear to be intact from outdoors yet be destroyed because a weight bearing beam or wall indoors may have failed or the home may have shaken off it's foundation. If the building has collapsed, has been totally submerged by flood waters, is burning or has jumped it's foundation, classify it as destroyed. If taller buildings are leaning more than a couple of degrees due to liquifaction or if the structure has "pancake" floor collapse, classify them as destroyed as well.

Aftershocks may cause further damage to structures to collapse. This is why CERTs should never enter destroyed buildings without first stabilizing a structure. This requires specialized equipment which CERTs do not usually have. Leave this to the professionals.

The Definition of "Major Damage" is, "The FEMA Category where an item or building is damaged to the extent that it is ***no longer usable*** and may be returned to service only with ***extensive repairs***." Examples of this would be structures flooded by water of six or more feet in depth, or structures with cracked foundations, or even structures that have lost all or part of one exterior wall or a partial floor collapse. Again, aftershocks may cause further damage or collapse. These structures may be searched for victims, however, use extreme caution and plan an escape route before entering.

The definition of "Minor Damage" is, "The FEMA Category where an item or building is damaged and ***may only be used under limited conditions***, but may be restored with ***minor*** repairs." Examples of this category would be structures that have lost decorative facades, exterior fire escape ladders, severed utilities or collapsed porches or awnings. These structures usually appear to be structurally intact. CERTs may enter these structures to search for victims of falling or moving appliances and fixtures. Again, use caution and plan escape routes from the building if aftershocks occur.

The definition of "Affected but Habitable" is, "The FEMA Category where a building ***has some*** damage to the ***structure*** and suspected damage to ***contents***. Structure ***is usable without*** repairs." Examples of this category would be structures with less than 1 foot of flood waters, interior wall cracking and some damages to interior contents and exterior facades. CERTs must pay particular attention to property owner rights. CERTs usually do not need to shelter or feed the residents of these structures and may even use these people to assist the team. Structures in this category may contain generators or even ham radios that the owner might volunteer.

Section 5 - Documentation for Damage Assessment

Property Assessment Reports

It is vitally important to document the damages in your neighborhood. Written documentation will give your team information needed to plan future activities. All information gathered during your assessments should be considered confidential. AVERT has produced a booklet with forms that you can complete to maintain the paper trail needed by government emergency services. You may also prepare your own form for this purpose.

Every written assessment must contain the date, time and location by street address. If you don't know or can't find the street address, write enough of a description so that others can find the property. The date and time are important because they establish a basis to determine secondary damages and may protect your team from legal claims that owners might make after the disaster.

The number of occupants should be noted. Many people will refuse to leave their homes unattended after a disaster. Your team needs to know where people are in the neighborhood so that food, water and medical care can be given to those in need. You also need to know if anyone at the location has special needs that complicate the services you might render. Examples of special needs might include wheel chairs for the disabled, or oxygen or insulin for the chronically ill.

Next, you need to evaluate and record the damage. Remember the four categories defined and described above? Include written comments that detail damages or indicate undamaged resources, such as tools, that your team might be able to use with the owner's permission. Remember that even though the structure may be destroyed, it, and all the property it contains, is still private property. You may not disturb anything without the owner's permission unless it is to safe a life. Also, any disturbance of property may have a effect on the owner's insurance claims.

Next, document the status of the utilities. Indicate whether the electricity, gas and water were turned off or left on. Again, use your judgement! Don't turn off a utility unless it posses a threat to the property such as a leaky gas line or broken water pipe. You must indicate whether a team member entered the structure and why! This could protect you from claims of theft.

Though not required for Damage assessment, you should also indicate the presence or absence of fire and whether you performed any initial triage of injured people at the location. If there is a small fire, you should indicate the size, location, the threat to nearby structures and whether it was extinguished by your fire team. If you performed triage or basic first aid, you should also record your actions. This might be the only record of who was injured and where they went after initial first aid. If two blank forms and a carbon transfer sheet are used, a copy can be stapled or otherwise fixed to the structure to indicate initial assessment data only. Do not complete fire, triage or potentially sensitive information if a copy is to be left at the scene. Do include team contact information on report copies left at the scene. This allows displaced relatives and others who visit the site to begin searching for information or shelter.

Partial floor collapse

El Salvador Earthquake, Destroyed

Affected but Habitable

Minor Damage, foundation

Framed House Shear Failure