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Grand Hyatt Kauai Mission Statement

“Our ohana is dedicated to creating the magical experience of old Hawaii for all of our guests. The true meaning of Aloha will guide our decisions at work and in our community as we strive to preserve the culture and traditions of Kauai.”

‘Ua ho'opa'a makou na' ohana o Hyatt e ha'i aku i na hana no'eau o Hawaii, kahiko i na malihini. Na ke Aloha e alakai'i i na hana a makou me 'oukou ke anaina. Ikuike ka malama 'ia o ko Kauai 'ano Hawaii.”

Grand Hyatt Kauai Disaster Recovery Plan

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Brigham Young University – Hawaii
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of the requirements for the
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William F. Harrah College of Hotel Administration

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Grand Hyatt Kauai Resort and Spa Disaster Recovery Plan

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Table of Contents

1. Introduction / Purpose Statement
2. Justification of Disaster Recovery Plan
3. Risk Assessment – Grand Hyatt Kauai
 - Hurricanes
 - Tsunamis
 - Disruption of Energy / Food Supply to Island
 - IT and Computer Disaster
4. Preparation and Planning
 - Key Planning Steps in Disaster Recovery
 - Selection, Implementation and Training
5. Disaster Recovery Plan
 - Follow up from Risk Assessment
 - Listing of Key Personnel and Teams
 - Local Resources and Entities
 - Areas of Responsibilities
 - Disaster recovery in event of weather related
 - Disaster recovery in event of IT/Computer disaster
 - Disaster recovery in event of supply chain imports
6. Testing and Maintaining Plan
7. Conclusion
8. References

Introduction

The Grand Hyatt Kauai (GHK) was opened in 1991 and sits on the beautiful south side of the Island of Kauai. This location makes the Grand Hyatt Kauai prone to disaster from a number of events. As a result, preparations for such events must be made and implemented. All staff must be made aware of the possibilities for disasters as well as what they should do in the event of a disaster.

Purpose / Scope

The purpose of this project is to create a Disaster Recovery Plan (DRP) which includes recovery instructions, procedures, and a quick reference guide for departments to use in order to respond and recover from hurricanes, earthquakes, tsunamis, disruption of energy/food supply to the island and computer and IT disasters. The DRP will also include procedures for ongoing training and certification for employees and managers of the Resort.

Justification of Disaster Recovery Plan

If created and used effectively, a DRP can potentially both save lives and resources, and also allow for quick recovery from a disaster. A DRP can be compared to liability insurance in that it provides comfort to employees and guests alike in knowing that if a catastrophe occurs, the property will be prepared to sustain itself and greatly mitigate heavy losses. According to Geoffrey Wold (Wold, 1997), specific reasons to create an effective Disaster Recovery Plan include the following:

- Minimizing potential economic loss
- Reducing disruptions to operations
- Ensuring organizational stability

- Providing an orderly recovery
- Protecting the assets of the organization
- Ensuring the safety of personnel and customers
- Minimizing decision-making during a disastrous event

While each of these reasons are simple, ensuring they happen through a DRP gives employees & guests assurance that when a disaster strikes, the resources and personnel will be in place and prepared. This DRP for the Grand Hyatt Kauai specifically, will discuss the procedures and requirements for each department, allowing them to use the DRP to its full potential by responding effectively to a disaster; therefore mitigating loss of life, property and resources.

Risk Assessment for the Grand Hyatt Kauai

Before developing a successful DRP, an assessment of risks for any property or business is extremely important in order to be able to plan for the correct potential dangers. The key is proper and targeted communication, training and preparation for each employee.

The Grand Hyatt Kauai is at risk of many disasters including information technology disasters, hurricanes, earthquakes, tsunamis, or disasters to the supply chain of energy, food, fuel and transportation to the island. So the Resort must complete an effective analysis of these specific risks regularly. The following risk assessment will analyze preparations for and responses to similar disasters listed above in other areas and properties.

According to S. Hoosian, (Hoosian, 2003), there are four categories of risk to any property or business. The first category mentioned is “people”. This category is very important to analyze in that anything that is a non-natural disaster could possibly be caused by people. Many

“natural” disasters are caused through many types of environmentally unsafe and unsustainable initiatives.

The second category of risk discussed by Hoosian is “process”. Properties are at greater risk through process failures and inadequate controls of the operational processes. The main concerns in this category will be discussed as a disruption or termination of food and energy sources and various IT caused disasters.

Third, Hoosian specifies a “system” as a strong risk that could lead to disaster. This category goes hand in hand with the two previously mentioned but also touches the realm of naturally caused disasters such as earthquakes, tsunamis, or hurricanes. If effective warning systems are not in place and adequately updated and checked on a regular basis this “system” failure would cause a more devastating disaster than a better warned population, business or property.

Finally Hoosian lists the risk of “external party/event”. This last cause of risk is all the occurring disasters throughout the world such as hurricanes, earthquakes, tsunamis, and more. The risk for low lying coastal areas is greatest as sea levels rise, more and more populations live or visit beaches and coastal towns and earthquakes and hurricanes are occurring more and more frequent. In each of these risks there are specific preparations and planning that must take place and be taught to the local population. It is in this communication that lives are saved and property and important data is salvaged and impacted less (Hoosian, 2003).

It is up to the local officials and the MC committee to classify and categorize each specific risk for the property. If the five or six main ones are assessed the planning and training will be more effective for all line staff up to the management and DRS.

□ *Assessment of Risk for Hurricanes*

In 2005 the entire city of New Orleans was slammed with a category three hurricane named Katrina. This storm was the most devastating natural disaster in recent decades for the United States, killing more than 1,800 people and becoming the costliest natural disaster to date for the U.S (Bunch, 2005). New Orleans is situated in the low-lying areas of the Gulf of Mexico and shaped like a bowl. So, the City of New Orleans had built levies to help protect from a flooding disaster. Unfortunately, in recent years the Federal Government had diverted funding for the improvement of these levees to the cause in Iraq (Bunch, 2005). As a result, these non-maintained levies broke during the hurricane and water flooded the city. The negative consequences following this neglect show just how disastrous poor planning can be.

While the city had poor disaster recovery planning, the Hyatt Regency New Orleans was well prepared. Many employees and guests were evacuated from the city early on. Also, employees were given the chance to work at other Hyatt properties as well. With an effective DRP in place, vital hardware and software were salvaged, or backed up, off site at a server in Atlanta. This saved vital financial, accounting, and private guest information. Proper planning enabled the hotel to mitigate the level of damage that Hurricane Katrina caused and to function as needed by providing information although their IT infrastructure was destroyed on site. Although the Hotel has yet to open still, lives were saved and vital records were protected.

The new stand alone Opera Property Management System being used at the Grand Hyatt Kauai is not currently setup to have vital data backed up in the event of a hurricane and needs to do so. The Grand Hyatt Kauai does have an on site stand-alone server, but needs a plan to have this backed up from an off site source as well.

Beyond the example of Hurricane Katrina, lessons can be learned from past hurricanes that have hit The Grand Hyatt Kauai itself. The Resort was built in 1991 and opened for business in 1992. Near the end of this first year, the Grand Hyatt Resort and Kauai Island was hit with a category four (133-155 mph winds) hurricane named Iniki, meaning “strong and piercing wind,” with the eye of the hurricane hitting directly over the Island. This damaged many structures on island, including the Resort. However, the Grand Hyatt was built to withstand forces from a strong hurricane because it is spread out into a hillside, which protected it. This was the biggest reason the Resort escaped from massive damages that other hotels in the area sustained.

Beyond its structural integrity, according to eyewitness accounts and employees who were there, the GHK had an efficient form of communication and handling of the storm. There was enough food and water for guests evacuated from their rooms to the Ballrooms and tunnels downstairs for protection. Also, the employees and management had a hurricane procedure plan and used it effectively. This hurricane procedure manual has been fully updated over the years the Resort has been open and serves as vital and important information in the next event of a hurricane. Coordination with local and state resources was also vital in ensuring the safety and protection of both guests and employees during and after the storm.

Due to its location, the risk of a hurricane striking the Resort again still remains. The fact that Kauai is so isolated in the middle of the Pacific Ocean creates an even greater risk for resulting disaster from a hurricane. And while current technology and meteorologists are able to predict hurricanes and prepare coastal cities and towns, on-location action must still be planned for if the Resort hopes to mitigate substantial loss and liability.

□ *Assessment of Risk for Earthquakes*

Earthquakes are a potential disaster for all of Hawaii (Delaney, 1990). While the most active island for earthquakes is the Big Island of Hawaii, which is in constant motion, the Island of Kauai is sitting over a very long and inundated rift zone of plates that has potential to create devastating earthquakes as well (Watson, 1997). Also, while the Big Island of Hawaii is at the most risk, all islands could be affected by its quake. For example, if the Big Island has an earthquake that rattles the ocean, it could trigger a tsunami that heads directly to Oahu and/or Kauai.

Several recent earthquakes, including large ones in Haiti, Chile and Taiwan provide valuable case studies. A focus on Haiti's quake will be most informative because of the level of damage caused. On January 10th 2010, a massive 7.0 earthquake rattled and crushed the Haitian capital of Port Au Prince. Similar to Kauai Island, Haiti is surrounded by ocean with little natural protections against strong storms or earthquakes. The Haitians had an estimated 1.2 million people living in the capital city prior to the earthquake. This disaster was centrally located within the capital region and did severe damage. "It is the most destructive event a country has ever experienced when measured in terms of the number of people killed as a share of the country's population and affected the capital city of the country" (Luhnow, 2010).

Government preparations were extremely inadequate, especially after the earthquake did massive damage to local resources, government buildings and police forces. Emergency supplies were not available or were in very short supply (Luhnow, 2010). The risk of an earthquake is hard to predict but seismologists are now better able to determine the chances of a specific location having an earthquake. If buildings are built to code or retrofitted to withstand shaking and movement caused by earthquakes, this will lessen the risk of loss of life. Unfortunately,

while information about potential risks was available, the Haitian Government did not use the information for such a disaster and so the effects from the earthquake were much greater than they could have been if adjustments had been made.

Estimates of the dead in Haiti range from 150,000 to 300,000 (Luhnnow, 2010). Haiti was already suffering as the poorest nation in the Western Hemisphere with several building and structural problems that ultimately contributed to the deaths of thousands. This natural disaster couldn't have been avoided, but the impact of it could have been avoided by preparations for such a disaster.

If a building is built to withstand shaking and movements, it will be better able to withstand a moderate earthquake (Infante, 2003). When the building is constructed with fewer floors, this will reduce the chances of toppling. In contrast to Haiti, structures are built to certain codes in the U.S. and must be followed in order to help protect them. Furthermore, the Island of Kauai has a law that a building cannot be built higher than the tallest coconut tree (Fischer, 2010). This law is mostly to keep the Island pristine and not over saturated with skyscrapers, but it also provides untold protections against possible earthquakes. The owners of the GHK have built a structurally sound edifice. By placing joints intermittently throughout the long hallways, and not having more than four levels, builders greatly increased the building's ability to withstand a disaster such as this. So, the risk for disaster from earthquakes for the Resort is great, but much less than for many of the buildings in Haiti.

The risk of an earthquake will always remain for this island and resort. However, the natural and man-made protections already put in place will greatly help if this were to occur. For the guests and employees who may experience this type of disaster, there must be effective

planning and procedures implemented and followed. All available resources must be utilized to be able to recoup and recover from such a tragedy.

□ *Assessment of Risk for Tsunamis*

On Dec 26th 2004, a 9.0 earthquake hit off Northwest Indonesia and created the worst tsunami in modern history. It caused over 225,000 deaths and displaced millions of people from over 11 countries. This massive tsunami affected miles and miles of coastal areas. All coastal areas that were near the epicenter were affected. Thousands of tourists were killed, and since the affected areas were on the coasts, many hotels and resorts were severely damaged or destroyed as well (Pearce, 2005).

A lot can be learned from the disaster recovery efforts in Northwest Indonesia. Governments and non-profit resources brought in massive amounts of help for the countries and victims that were affected. Globally, countries provided over \$3 billion dollars in aid (Pearce, 2005). The existing risk assessment for a tsunami painted a bleak picture for the affected areas of Maldives, India, Sri Lanka and Indonesia, which unfortunately, followed predictions. Island communities were completely devastated from this disaster. Being a completely isolated island, Kauai would need outside support immediately in order to recover successfully.

According to the United Nations Atlas, approximately 60% of the world's population lives 60 kilometers from the coasts (Payne, 2010). If this number is correct, the potential loss of life is extremely great for people that live so near the oceans, including Kauai. On Kauai Island, virtually all of the population on Kauai lives near the ocean. There are some highly elevated areas where small amounts of people live but the vast majority of vacationers and local populations live dangerously close to the ocean. The GHK sits on Keonelo Bay and fronts the

massive Pacific Ocean. If a tsunami were to strike, the low-lying Resort would be at high risk for damage. This is an inevitable aspect of operating right on the ocean and not being built very high up. If a tsunami were to strike, it would certainly cause widespread damage and possible loss of life.

Beyond sitting isolated in the middle of the Pacific Ocean with little protection against a massive tsunami, cause for concern among Hawaii residents and tourists are the potential for earthquakes on the Big Island of Hawaii. As the Big Island is constantly in motion and has the world's most active volcano, the potential for a tsunami disaster is very high for the GHK. If an earthquake strikes on the Big Island, it will only be hours or minutes before a tsunami could hit the Resort. The position of the Resort sits at the southeast end of Kauai and is open for possible western moving tsunamis from the Big Island.

Effective preparation for a powerful tsunami is vitally important and necessary due to the fact that there is often little or no warning ahead of time. Fortunately, the Pacific Tsunami Warning Center, a branch of the National Oceanic Atmospheric Administration, maintains buoys throughout the world's oceans to help predict and issue warnings if possible tsunamis are generated and approaching populated areas (Slater, 2009). The GHK has a nearby siren maintained by the Civil Defense to sound if a threat is present. Other measures lowering risk in conjunction with national warning systems are mechanisms at the Resort that help in the event of a tsunami disaster. Both local resources and national government warning systems and communications, if correctly functioning, have the potential to save lives.

A good example of these systems working smoothly is a tsunami recently generated by a huge earthquake just off the coast of Chili. On February 27th 2010, a very strong 8.8 earthquake hit south of the Chilean capital, Santiago. This set off tsunami warnings for the entire Pacific

Rim including Japan, Australia and others. Hawaii was splattered all over the local and national news because a devastating tsunami was predicted as heading to all the islands. Preparations were already in the making as early as 2:00 am on February 28th. Managers were communicating to Civil defense officials on Island for any updates. The GHK issued a vertical evacuation from the first, second, third, and fourth floors to the higher and more protected fifth and sixth floors. Guests and staff were asked to move up and wait until Civil Defense officials issued the all clear. Food and beverages were served and communication from management was announced on the PA system periodically. Fortunately in the end, no damage was done in Hawaii. Many countries were angry and felt that warning was over hyped, but scientists defended their positions of issuing the warning and all agreed that preparation and warning is better than possible devastation. Countless guests expressed their thanks and compliments to the staff and management of the Grand Hyatt for the preparation and steps they took to ensure the safety and security of the guests, employees and property. While the Resort is at high risk from a tsunami as illustrated recently, advanced warning systems and well planned response procedures help lessen the risk of big disaster.

□ *Assessment of Risk of Disruption of Energy and/or Food Supply*

Kauai imports 90% of its food and virtually all of its fuel needs (Maesley, 2009). It is home to over 60,000 residents and has thousands of visitors on any given day and depends heavily on imports to sustain the need to provide food and fuel to these people. With such dependency on importing vital resources, Kauai is at risk for massive disaster should there be a disruption of food and fuel sources to its population. Kauai is dependant on others to sustain it, and the Resort is no exception. As most of the Resort's needs are shipped in, it is vital to build up

food and fuel storage where feasible in the event of a sudden halt in arrivals of these items. The risk of a severe disruption is more prevalent now than ever before because of the growing global economy. There has been significant increase in international business dependence in the last few decades, so the Island has become even less self-sustained and more vulnerable.

Any outbreak of war, massive weather disaster, or political block could disrupt the flow of Kauai's needs. If this was to happen and Kauai had to fend for itself without any ability to import its needs, a disaster of unprecedented proportion would result. As the risk for this happening continues to increase, plans must be made and reviewed to mitigate the potential for a full-scale disaster resulting. The Resort can do its part but must use local and national government agencies to help.

Norman Church, a prominent UK professor and scientist, classifies the current food supply and delivery chain as "vulnerable, inefficient, unsustainable, and scary" (Church, 2005). He says that there are too many different factors now from point a to z in the production and delivery of food and fuel to those who require it. The demand is stronger than ever before and even with advances in technology, there continues to be little or no built up storage of the essentials to provide communities the ability to sustain themselves. As the aforementioned disasters are possible, the need to have vital supplies on hand could be a means of life or death.

The Resort and Kauai are at higher risk because they sit thousands of miles away from any significant landmass that could otherwise provide needed supplies more readily. If there is an emergency, people must be proactive in developing a plan and stocking up on the necessary resources.

□ *Assessment of Risk for Computer and Information Technology Disaster*

Because technology drives business by accurately keeping records, information, etc., there must be disaster procedures in the event of a disruption or destruction to the company or property's hardware, software, servers, and all related IT assets. New forms of disasters to the IT infrastructure are becoming more and more possible and prevalent. Whether the disruption happens due to a hacker in the system or is caused in relation to a natural disaster, there must be plans and procedures in place to mitigate loss and liability.

Although Resort information is kept on an isolated, stand-alone server, the Grand Hyatt Kauai still has strong potential and risks for many forms of an IT disaster. Protections, encryptions, security, backups, and many other positive protections must be available and used in order to minimize risk. If a company's IT assets were hacked or destroyed, there could be damage, both to the physical assets and to the thousands of database records. Employee personal information could also be at risk. The mitigation of IT sabotage must be implemented. Since there are so many opportunities for IT disasters, listing each is the best way to understand clearly, what they are.

□ Specific IT risks for the Grand Hyatt Kauai:

- Hardware - Hardware risks of theft, "switching or swapping", or permanent damage from other type of disaster or incident.
- Software – Programs and systems vulnerable to hackers, theft, or destruction caused by other disaster related event.
- Communications – Internet and data services potentially could be damaged or destroyed. Either on-site or service from the US Mainland could be affected.

- Data files – Backup and storage could be damaged or destroyed maliciously or accidentally. Risks include loss of important guest and company information and data.
- Two data centers – Server is stand alone and has potential to be damaged or destroyed. Must have backup at secure location(s). Operating from Kauai provides both advantages and disadvantages of server overload or of only option to use.
- Multiple computers – Includes threat of hackers into servers through one of many computers or connectivity from the outside remotely.
- Service centers – Data services and Oracle have potential for security to be compromised. This would be out of Resort's control because the property must rely wholly on service security from the provider.
- Consortium arrangement – If any third parties are granted access or read-write ability to certain programs and data, they are able to get into the systems and extract certain valuable information.
- Vendor supplied equipment – Must have strict agreement implemented to only allow vendors and property to divulge certain rights with or without the administrator's permissions. The equipment could become target or corrupted.
- Combinations of the above – In this case, there is more chance to damages that will compromise the safety and security of employees, guests and third parties involved in the daily operations of the Resort.

Preparation and Planning

According to the risk assessment in the previous chapter, the Grand Hyatt Kauai has a high level of risk for several disasters to strike. The different types of disasters have been mentioned as weather related (hurricanes, tsunamis and earthquakes), or naturally occurring; a breakdown of the supply chain of food, fuel and energy to the isolated Island, or an IT related disaster. Each one of these brings possibilities for great losses which includes property or lives within the Resort. As discussed, because no location will ever be safe from any type of disaster, the mere fact that a Disaster Recovery Plan has been put into place will quell fears for many employees and guests. The success of this DRP will be the quick thinking, well thought out and tested procedures that will be enacted, based off the previous risk assessment.

As mentioned in the risk assessment, there are three specific disasters that the Grand Hyatt Kauai must plan and prepare for in order to minimize loss of life and property. The first place to start is by determining the strength of a disaster occurring, and so, the risk to the hotel. Shamsudin Hoosian (Hoosian, 2003) developed a risk quadrant that will be used for this purpose. He detailed four risk levels that will be used by the DRS and MC members to evaluate the risk each disaster poses to the Resort. To quantify each risk using Hoosian's model is helpful for all involved from responders and management down to the line staff to understand the potential for each event. Shown below are the details of Hoosian's levels of risks (Hoosian, 2003):

Risk Quadrants Grid

Insignificant Impact High Likelihood <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">Medium-Low Risk</div>	Significant Impact High Likelihood <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto; background-color: #e0ffff;">High Risk**</div>
Insignificant Impact Low Likelihood <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">Low Risk</div>	Significant Impact Low Likelihood <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;">Medium-High Risk</div>

**All listed potential disasters mentioned in DRP categorize as “high risk” assessment.

Quadrant Risk Assessment

- (i) Significant Impact and High Likelihood - High Risk
- (ii) Significant Impact and Low Likelihood - Medium-High Risk
- (iii) Insignificant Impact and High Likelihood - Medium-Low Risk
- (iv) Insignificant Impact and Low Likelihood - Low Risk

The significance of impact must be evaluated and the amount of possible damage must be assessed. It will be the responsibility of the DRS and MC members to conduct a full assessment on the level of impact and amount of likelihood of the specific types of disasters that could happen at the Resort according to Hoosian’s chart.

Key components in the successful preparation for and recovery from a disaster are first and foremost, *preparation and communication*, which, in and of itself reinforces the importance of training. All managers and the “Disaster Recovery Team” will be responsible to learn the procedures and train their staff in accordance with the DRP. They are required to conduct training from one section each quarter for staff. Training will be necessary for management to

disseminate important information to their employees. Proper venues for the required training can be in various preshifts, department meetings, or one-on-one training sessions.

Preparation for a disaster is necessary and vital. Specific preparation will be discussed further on, but the most effective preparations include knowledge and communication that occur before the disaster. The key employees and positions will be held accountable for learning the procedures to perform within the DRP should a disaster strike the Resort. These key positions will be listed within the DRP later. Copies of the DRP will be located within each department and also within Human Resources, Security and all MC members' offices.

Key planning steps

In the event of a disaster it is imperative to have a plan in place (Melton, 2009). If an organization is not prepared, the hotel and company not only will need to recoup from the effects of the disaster, but the company will have to deal with possible negative fallout to its brand due to poor preparations or litigious action. This can become cataclysmic; as recovering will then include convincing guests they are safe when staying at any Hyatt properties. So, management and corporate headquarters must have specific procedures to protect them from various liabilities that befall a property from certain types of disaster. The following will detail the steps and responsibilities in formulating a Disaster Recovery Team and what specific duties will entail.

Selection, Implementation and Training

- MC (Managing Committee) initially meets to select Disaster Recovery Specialist and Assistants, to formulate flow of plan and how to disseminate information. The MC should vote unanimously (ideally) for the DRS and their two Assistants.
- The MC members will all be members of the Disaster Recovery Team (DRT). They will also choose key members in addition to themselves for the DRT. With the help of the newly called DRS and Assistants, the MC members will select specific positions for yet additional assistance on the DRT (Disaster Recovery Team). DRS and DRT will include specific positions as much as possible so as not to depend on certain employees as often as possible. Although GHK does have longstanding employees with expertise, the reasoning behind this is to eliminate the dependence on specific employees.
- MC members formulate venues and select times and frequency of training of general Resort staff, managers, department heads and key personnel in the DRP.
 - i. General training will begin in a full staff meeting scheduled by the General Manager. After initial implementation of the DRP, the new DRS will rotate through all departments for their training, and attending one preshift each. The new training pattern will be as follows:
 - General staff meeting once a quarter to review specific topics of the DRP and discuss. (DRS to plan and conduct training topics)
 - General preshift meetings monthly with department heads to conduct training for each of their employees.
 - Half yearly department checklist and report card summation regarding the DRP preparations. (This to be delegated by the DRS).

- Disaster Recovery handouts and notes to be posted in every department on memo or preshift board. Department heads to create and be approved by Division heads and DRS.
- Prepare the key departments and local resources for DRP implementation (Front office, Executive office, Security, Engineering, F&B, etc.).
 - i. More specific preparation and pre-DRP meetings will take place with key departments such as H.R., Executive office, Security, Engineering, and F&B).
 - Pre-meetings will be set up to assess the current level of preparation within departments and their emergency checklists. These pre-meetings will be combined with all DRP assistants and the Specialist.
 - Invitation of local community and State resources and entities to attend meeting discussing certain sections of the DRP that include communication and contact with them. The purpose of this meeting will be to create stronger bond of communication and assistance (spearheaded by the DRS).
 - Assess the Engineering and Security resources. Director of Security and Director of Engineering will meet with the DRS and will do full assessment and document findings of current practices and improvement opportunities. Key areas to look for are responding SOP's for disaster codes and knowledge of staff in certain disaster situations.

Disaster Recovery Plan

In the Disaster Recovery Plan individual positions will be assigned to carry out the training and implementation of the Disaster Recovery Plan. These individuals will have very specific responsibilities and be held accountable in the certification and training of employees. The DRS will publish and print copies of the entire DRP for each department while listing the names of key positions and departments. The following positions will be given the following titles, responsibilities and teams.

Key Personnel and Teams

1. Team #1 - Disaster Recovery Specialist – Director of Security
 - a. May select two key employees to assist in performing duties and training. May select any employees they wish.
 - b. Will be the absolute decision maker and trainer in the preparation and carrying out of the DRP for all employees.
 - c. This position will be unanimously decided on by the MC committee members and they must agree to fully commit to the position of DRS.
 - d. Other members of this Team include the General Manager, Director of Public Relations and Director of Human Resources.
2. Team #2 – First Assistant Disaster Recovery Specialist – Director of Engineering
 - a. Main responsibilities include meeting with and following instructions by the DRS. The Assistant Director will also be the go to person should the DRS not be available prior to or during a disaster. The

Assistant will conduct inventories of all equipment and supplies as deemed necessary.

- b. Key positions for the First DRS Assistant to use as needed are the Water Features Manager, Asst. Dir of Engineering, Landscaping/Grounds Manager, Project Manager, and three separate employees from first, second and third shift as deemed necessary.
3. Team #3 – Second Assistant Disaster Recovery Specialist – Director of Rooms
 - a. The Second Assistant DRS will also be the go-to person, should the DRS or First Assistant DRS not be available. This person will also be over the task of evacuations and caring for all guests at the Resort. This person will also work closely with the General Manager in carrying out duties and tasks that are assigned.
 - b. Key positions for the first Assistant to use as needed are the Front Office Manager, Director of Housekeeping and Public Areas, Director of Guest Services and three separate employees from first, second and third shift as deemed necessary.
4. Team #4 - Additional Key DRP Staff
 - a. Director of Human Resources: over the communication and assistance for all employees and their families.
 - b. Assistant Director of Human Resources: to assist the Director of HR.
 - c. Director and Coordinator of Purchasing: to coordinate and inventory all available and stocked equipment and resources.

- d. Director and Assistant Director of Food and Beverage: responsible for all emergency food and beverage resources and outlets of the Resort.

Local Resources and Entities

This section will comprise a list of various local resources and entities that will be used as emergency contacts. Communication with local resources and entities will be vital prior to and in the event of a disaster. The following entities are listed and the DRP Specialist, or the Specialist's Assistants, will be responsible to open communication with those necessary depending on the type of disaster experienced. Of course, fostering strong relationships and trust with each entity will also be very important to get the backing and immediate help required when faced with a disaster.

1. Kauai Police Department – (808) 241-6711
2. Kauai Fire Department – (808) 742-1516
3. Civil Defense – (808) 241-6336
4. Kauai Dept of Water – (808) 245-5400
5. Kauai Gas Company – (808) 245-3301
6. Kauai Island Electric – (808) 335-6236
7. Wilcox Memorial Hospital – 245-1100
8. Lihue Airport – (808) 246-1400
9. U.S. Coast Guard – (808) 246-1081
10. Hyatt CSC for all IT and computer related (603) 570-0788
11. Mid Pacific Communications – (808) 246-9334

Areas of Responsibility

1. Human Resources

- Compile accurate and up to date contact information of employees and purchase communication system to send out automatic text messages and emails if necessary to communicate with all employees at once.

Blackboard system is currently in operation and was recently tested during the tsunami warning of Feb 2010.

- Be the contact source for employees and employee's families.

b) Rooms Division

- Accountable for all guests and guest's information. Will be the liaison for communication to guests and guest's families.
 - Accounting for employees and guests (applies to every disaster except an IT disaster). Assist the physically impaired and physically check all occupied rooms. (Assigned to Front Office Manager and security personnel)
- Will coordinate registration and evacuation (if necessary) of all guests at the Resort. The Director of Rooms will determine this coordination.
- Responsible for guest's storage, bedding needs, food needs, communication needs, etc. for registered guests at Resort. (Assigned to Front Office Manager)
- Generates emergency lists of guests.
- Store supplies needed in each case of disaster.

c) Security

- Responsible for safety and security of Resort.
- Will be the go to for any first aid or health related issues from either guests or employees.
- Will be communication source for local agencies and government assistance.
- Will conduct patrols and ensure that only authorized personnel are allowed into or out of the Resort depending on the status of the disaster.
- Will provide emergency supplies and assist where needed.

d) Engineering

- Responsible for the physical assessment and repair of possible damages to the Resort.
- To ensure equipment and assets are properly working and useable, and hazards are removed.
- Will work with local agencies regarding power, fuel, food, etc. and assist where needed.

e) Public Relations / General Manager

- Will conduct press conference and interviews if required. Will be main point of contact for corporate headquarters. Will issue statements as required.
- Will become spokespeople on behalf of the Resort and will give periodic PA announcements and instructions as deemed necessary.

Disaster Recovery Plan in the event of weather related disaster

➤ Emergency plan and specific requirements

Each Department to review specific requirements and coordinate with DRS regarding threat levels.

- Level 1 – At the first phase, Department heads and DRP specialists should be aware of information and be able to communicate to guests and employees any changes to threat levels.
- Level 2 – At the second phase, preparation of and assessment of all emergency personnel, equipment and resources. Full inventory and communication to the guests on the status known of the disaster.
- Level 3 – Third phase will be just prior to the disaster and all evacuation and emergency procedures should now be implemented. The general Manager should go over the PA system and give specific instructions. Communication should be ongoing to all available resources to inform of status and desired steps to take.

□ Preparation of weather related disaster (at time of notification)

- Create a command center. 1st option is Training room in tunnel or 6th floor Presidential Suite. (DRS/GM)
- DRS to conduct full disaster assessment based on Hoosian's risk quadrant grid (found on page 4).
- Notify Hyatt Corporate Headquarters of the situation and the intended actions (GM/DRP Specialist)

- Designate a spokesperson as required. Develop a written statement for media.
(GM/PR)
- Check all auxiliary generators and ensure that sufficient fuel is available.
Sufficient level is for minimum of 72 hours. (Dir. Engineering)
- Check inventory of all emergency supplies in storage area. Ensure the list of
supplies is up to date and available. (Dir. Security/Dir. Purchasing)
- Check operation and inventory of all Hotel vehicles on site. (Dir.
Engineering/Dir. Guest Services)
- Ensure proper working order of loudspeaker system, inventory of megaphones
and radios. (Dir. Security, Dir. Engineering)
- Ensure training and operations of engineering department staff for locations of
all shut off valves for gas and water and location of all breaker panels. (Dir.
Engineering)
- Check operation of emergency lighting and all flashlights. (Dir. Security/Dir.
Housekeeping/Dir. Front Office)
- Ensure all severe weather clothing is on hand (i.e. rain gear, boots, hats, gloves,
etc.). (Dir. Security/Dir. Engineering)
- Ensure all control logs for emergency equipment and supplies are created and
ready for use. (Dir. Engineering/Dir. Security/DRS)
- Check all inventories of batteries, radios, pagers, and other communication
devices. (Dir. Security/Dir. Engineering/Dir. Housekeeping)
- Secure all chemicals. (Dir. Security/Dir. Housekeeping)

- Patrol grounds and take note of any areas in need of improvement or additional preparation. (Dir. Security/Dir. Engineering)
- Ensure availability of sandbags and count total inventory levels. (Dir. Engineering)
- Check and test all emergency lighting. (Dir. Security/Dir. Engineering)
- Check all roofs and balconies. (Dir. Engineering/Dir. Housekeeping/Dir. Security)
- Ensure all landscaping equipment is in working order, especially carts and chainsaws. (Dir. Engineering)
- Monitor National Weather Service announcements. (GM/DRS/Exec. Rooms)
- Prepare for sheltering if required. (Exec. Rooms/DRS)
- Gather registration list of all guests. (Exec. Rooms/Dir. Front Office)
- Prepare sign-in sheets for guests and employees requiring shelter. (Exec. Rooms/Dir. Front Office)
- Maintain a list of guests and employees evacuating the area. (Exec. Rooms/DRS)
- Check all drainage pumps, battery powered equipment and back-up power sources. (Dir. Engineering)
- Ensure that sewers and drains are clear and in working order. (Dir. Engineering)
- Secure all outdoor equipment. (Dir. Engineering)
- Store drinking water. (Dir. Purchasing)
- Movement of furniture away from windows and high-risk structures. (Dir. Housekeeping/ Dir. Engineering)

- Fuel all company vehicles. (Dir. Engineering/Dir. Guest Services)
 - Ensure storage of linens, pillows, blankets, etc in safe and secure area. (Dir. Housekeeping)
 - Conduct inventory of light sticks, flashlights, supplies, etc. (Dir. Engineering/Dir. Security)
 - Secure cash computers, software, documents, safe deposit boxes, hardware, servers and various other IT equipment. (MIS Director/Dir. Rooms/DRS)
 - Locate and inventory emergency medical supplies. (Dir. Purchasing/DRS)
 - Find out if any guests are physicians. (Dir. Front Office)
 - Communicate the situation to guests and employees. (GM/Dir. Rooms/Dir. Security)
 - Prepare sandbags; tape, boards and other needed materials to protect premises. (Dir. Engineering/DRS)
 - Implement current emergency plan for physical security of building and safety of guests and employees. (Dir. Security/DRS)
 - Gather portable radios and ensure they are charged and operational. (Dir. Engineering/DRS)
 - Recall essential staff and release non-essential staff as required. (Various department and Divisional heads)
- 24 hours to landfall of weather related disaster
- Notify Hyatt Corporate Headquarters of the situation and the intended actions (GM/DRP Specialist)
 - Monitor National Weather Service announcements. (GM/DRS/Exec. Rooms)

- All guests will be evacuated to designated areas.
- Bring in all guest room furniture from balcony. (Dir. Housekeeping)
- Fill as many tubs as possible in guest rooms for potable water use. (Dir. Housekeeping)
- Shut down gas lines, equipment, electrical power as required by Dir. of Security and Dir. of Engineering.
- Install barricades as required. (Dir. Engineering)
- Lower all water levels of pools, implemented in current Water Features department procedures. (Dir. Engineering)
- Relocate Water Features equipment to chiller plant. (Dir. Engineering)
- Removal of all poolside and lower level items not secured. (Recreations Manager)
- Check all auxiliary generators and ensure that sufficient fuel is available. Ideally would be enough to run for 72 hours to one week. (Engineering and Security)
- Assess the employees and conduct guest counts room to room. (Security, Front Office)
- Offer assistance where needed for any possible evacuations, medical emergencies, travel arrangements, etc. (Security, Rooms division and DRS)
- Prepare for evacuations with enough food, water, fuel, and bedding to last for one week. (Rooms division, Food and Beverage, DRS)
- Get employees on set “emergency” schedule (12 hrs. on and 12hrs. off) and managers to stay until no longer required. (Each Department Head will coordinate)

- Post weather related disaster
 - Immediately conduct a damage survey and determine any injuries or immediate emergency situations. (Dir. Security, Dir. Engineering, DRS)
 - Communicate status to emergency personnel, Corporate headquarters and the Risk Management Department, any other necessary entities. (Dir. Security, PR Manager, GM)
 - Inspect all major equipment, IT infrastructure and issue report to General Manager and DRS as soon as possible. (MIS managers, Dir. Engineering)
 - Coordinate clean up and recovery phase as deemed necessary. (Dir. Security, Dir. Engineering)
 - All available employees to help out where needed and where assigned. (various department heads)
 - Keep communications and statements to media directed to the Dir. of PR and the General Manager.
 - Depending on the specific weather related disaster, the PR manager and General Manager will assess the damage and prepare statements to disseminate to local and corporate entities.
 - Full damage assessment will be asked of the DRP specialist and the Assistants, Engineering, Security and others for guests, employees, any structural damages, loss or damage of equipment, and others.
 - Tend to all needs for guests and employees. Food and water top priority along with shelter as needed. (assigned as necessary)
 - Communicate as frequently as possible to local resources. (Dir. Security)

- Depending on the severity of the disaster, and if feasible, conduct full structural, gas, fuel and electrical conditions assessment, and eliminate hazards and conduct repairs to necessary equipment.
- Continue to communicate to all local, Federal and Corporate entities of situation and status.
- Prepare media and corporate statements.
- Continue to provide all available support and assistance to injured or traumatized guests and employees.
- Begin cleanup and removal of damaged items, equipment and trees. (Dir. Engineering)
- Conduct documentation and full reports of full assessment of disaster. Provide cost estimates for replacement and repair of all damages resulting from the disaster. Communication with insurance companies to take place.
- Provide necessary counseling if needed.
- Additional preparation open for review through MC members. Members to incorporate monthly, quarterly discussions and add changes as needed.

Disaster recovery in event of IT/Computer disaster

- Preparation of IT related disaster (At time of notification)
 - DRS to conduct full disaster assessment based on Hoosian's risk quadrant grid (found on page 4).
 - Follow same process as the preparation of weather related disaster as applicable. Ensure that DRS and MIS manager have fully conducted their responsibilities for training and IT compliance by each employee.
 - Secure servers and account for all equipment. Move loose equipment to secure server room as deemed necessary.
 - Ensure that scheduled backup to mainland servers for storing data is occurring correctly.
 - Ensure that communication quarterly with various providers of IT infrastructure has been occurring properly (Micros, Fidelio, On Command, Lodgenet, Lotus, etc.) to ensure compliance and technical support.
 - MIS manager fully made aware of situation and given constant updates.
 - MIS manager and Accounting Controller to be the contact personnel for any IT related problems.
 - Shut down all equipment outside of the server rooms and MIS office.
 - MIS management to communicate to corporate for specific instructions and plan of action depending on the severity of the problem.
- Emergency plan and specific requirements
 - Managers to report any problems and challenges to the MIS managers.

- MIS to conduct assessment of equipment and programs. Will conduct research on cause of problem and remedies possible.

➤ Post IT related disaster

- Corporate to give instructions and plan in place already.
- Communicate and report to corporate headquarters immediately on damages sustained and impact to equipment and records.
- Conduct equipment status and scan for hardware/software issues.
- Survey the backup data and ensure that all is updated and safely stored through the off site servers.
- Get Hardware and data services up and running as soon as possible.
- Salvage any equipment possible that was not compromised.
- Server repair work begins.
- Off-site backup transferred to on-site servers. Wait until corporate specifies if Resort needs new servers or the current ones are deemed safe.

Disaster recovery in event of supply chain imports

➤ Preparation of supply chain imports disaster (at time of notification)

- DRS to get full reports and status of delays or halt of supplies to the Island.
Identify causes and options for alternate sources of food and fuel.
- DRS to conduct full disaster assessment based on Hoosian's risk quadrant grid (found on page 17).
- Open communication to all Federal and State Government agencies for assistance in getting the supply chain opened up again.

- Conduct full assessment of storage and amounts of supplies of dry goods and non-perishable food and water.
- Conduct assessment of number of guests and employees that will need assistance.
- Emergency plan and specific requirements
 - DRS to ration all food and water. Will work closely with the Director of Purchasing and Director of Security in implementation if necessary.
 - Ensure that there is enough food and water to last one week stored on property.
 - Ensure that enough fuel and power supplies are fully functional and able to last at least one-week minimum.
 - Constantly communicate with and conduct awareness with local farmers and suppliers of food and water resources to the Island. Ensure that they have contingency plans in place in the event of a disaster.
 - Ensure that good, strong relationships are established and fostered with County, State and Federal entities to be able to provide necessary support in the event of a supply chain disruption or disaster.
 - Periodically test and maintain emergency food and fuel supplies.
 - Security and Director of Rooms Manager will be key in the communication and distribution of emergency food and water if necessary.
 - Appeal to local suppliers and Civil Defense for supplies that will be necessary in this event.
- Post supply chain import disaster
 - As supplies begin to flow back to the Island, restock storage areas.

- Contact Corporate and have Accounting Department fully assess the dollar amount of expenditures required to sustain the Property during the emergency.
- Ensure that all communication to every pertinent entity is in full effect to update them of the situation and amount of food, water and fuel that is on hand, number of employees and guests requiring assistance and any specific health concerns.
- Communicate to corporate headquarters and notify of situation and actions being taken.
- Appeal for assistance to governmental and global entities.

Testing and maintaining plan for GHK

- After all approvals from the MC take place, the DRS will design and print DRP manuals for each department and extras to be given out to local and state entities and additional for employees.
- DRS will initiate monthly training and re-certification for individuals and staff members.

DRS will schedule these training sessions as desired and will be required to attend at least one preshift in one month's time to speak to all employees of particular departments. DRS will give quizzes and account for all certified employees who pass the quizzes and take required training.

- MC and DRS to distribute copies of DRP to departments and managers, HR and Executive Committee members in staff meeting.
- On the Resort Intranet- MIS will create a tab for DRP and have a monthly procedural review for employees. (Those in departments without computer access to review in department preshifts if feasible)

- Quarterly guest speaker invited for staff meeting to review and rekindle emergency and disaster recovery awareness. Guest speaker should be chosen from the local community as often as possible.
- As this DRP will be an ongoing and evolving manual, the DRS and MC will constantly review procedures and edit any necessary changes.

Conclusion

This Disaster Recovery Plan has been put together to minimize damage and liability in the event of a disaster that could potentially affect the employees, guests, and hotel. There is no full proof plan to combat all possible damage that could result due to any disaster, but with proper planning and communication, this plan provides an outline needed for good decision making that could potentially saves lives and minimize damage before, during, and after a disaster.

Risks for disaster will always exist for hotels and resorts and it ultimately is up to the planning and preparation processes that will be the means of saving or minimizing many of the effects from these unforeseen hardships. It is vital to look to the past and present and learn from them in order to progress in the Resort's abilities to withstand or avoid disasters. At times, disasters are completely unexpected and nearly impossible to prepare for effectively, such as the 9/11 attacks, but the majority of disasters are somewhat predictable and anticipated. This allows for preparations such as outlined in this DRP.

This DRP must be integrated into the mindset of the members of the GHK Ohana (family) and used to help educate important steps and procedures in combating the chaos and fear prior to, during and after a disaster. It is up to the MC to support and promote this document, and also the responsibility of the DRS to ensure that its full benefits are realized. Preparation for any type of disaster helps those involved so much more than if no preparation was completed.

As mentioned and analyzed, there are many ways that disasters can strike and in this DRP prepared for the Grand Hyatt Kauai, there have been listed only a small number of significant disasters that continually threaten the Resort. This DRP is developed to plan and

prepare for the possibility of such disasters. It is prepared to assign specific steps and procedures that must take place in order to mitigate the possible loss of life and property that recently took place in locations such as Haiti, Chile, New Orleans and others.

References

- Anonymous. (Sep, 2006). Emergency and Evacuation Preparedness Plan for Crescent Creek Resort. Retrieved online Mar 2010 from,
<http://www.co.klamath.or.us/comdevelopment/Planning/Crescent%20Creek/Exhibit%20P%20-%20Emergency%20&%20Evacuation%20Preparedness%20Plan.pdf>
- Anonymous. (Oct, 2008). Hurricane Iniki Devastates Hawaii. Retrieved online Jan 2010 from, <http://www.hawaiihurricanes.com/hurricane-iniki-devastates-hawaii/>
- Bunch, W. (Sep 2005). Why the Levee Broke. Retrieved online Feb 2010 from,
<http://www.alternet.org/story/24871>
- Church, N. (2005). Why our Food is so Dependant on Oil. Retrieved online Feb 2010 from, <http://www.321energy.com/editorials/church/church040205.html>
- Delaney, P. et al. (Mar 1990). [Deep Magma Body Beneath the Summit and Rift Zones of Kilauea Volcano, Hawaii](#) *Science*, New Series, Vol. 247, No. 4948 (Mar. 16, 1990), pp. 1311-1316 Published by: American Association for the Advancement of Science Stable URL: <http://www.jstor.org/stable/2873718>
- Fischer, J. (2010). 50 Things You Might Not Know About Hawaii. Retrieved online Feb 2010 from,
http://gohawaii.about.com/od/onlyinhawaii/a/50_things_you_might_not_know.htm
- Hoosian, S. (2003). Summary of Risk Assessment Methodology. Retrieved online Feb 2010 from, http://www.auditnet.org/docs/risk_csa.pdf
- Infante, Ralph. (2003). Earthquake safety: Before the earthquake starts. Retrieved online Feb 2010 from, <http://nilesema.com/earthquakesafety1.htm>
- Jurkiewicz, C. (2009). Political Leadership, Cultural Ethics and Recovery: Louisiana

- Post-Katrina. Public Organization Review, 9(4), 353-366. Retrieved January 2010, from ABI/INFORM Global. (Document ID: 1919988061).
- Leatherby, D. (2008). IT Disaster Recovery and Business Continuity Tool-Kit: Planning for the Next Disaster. Retrieved online Feb 2010 from, <http://www.nascio.org/publications/documents/nascio-drtoolkit.pdf>
- Luhnow, D. (Feb, 2010). Haiti Quake Damage in Billions. Retrieved online Feb 2010 from, <http://online.wsj.com/article/SB10001424052748703798904575069614263432520.html>
- Maesley, K. (2009). Strategic Plan for Food Self-Sufficiency for the Island of Kauai. Retrieved online Feb 2010 from, http://www.kauaiagriculturalforum.org/docs/Food_Industry_Proposal.pdf
- McKinney, M. (2009). Plan Before the Panic. Hospitals & Health Networks, 83(11), 35. Retrieved January, 2010, from ABI/INFORM Global. (Document ID: 1914015931).
- Melton, A., & Trahan, J. (2009). Business Continuity Planning. Risk Management, 56(10), 46-48. Retrieved January, 2010, from ABI/INFORM Global. (Document ID: 1923690921).
- Nobel, C. (2005). Katrina: The ultimate testing ground for Disaster Recovery. Retrieved online Feb 2010 from, <http://www.eweek.com/c/a/IT-Management/Katrina-The-Ultimate-Testing-Ground-for-Disaster-Recovery/>
- Pararas, George. (2007). Hurricane Risk Assessment for the Hawaiian Islands. Retrieved online Mar 2010 from, <http://www.drgeorgepc.com/HurricaneRiskHI.html>
- Payne, B. (2010). UN Atlas: 60% of us Live in Coastal Areas. Retrieved online Feb 2010

from, <http://coastalchallenges.com/2010/01/31/un-atlas-60-of-us-live-in-the-coastal-areas/>

Pierce, F. (2005, January). Tsunami: The impact will last for decades. *New Scientist*.

January 2005 issue 2482. Retrieved online Feb 2010 from,

<http://www.newscientist.com/article/mg18524825.100>

Slater, D. (2009, October). Business continuity and Disaster Recovery Planning: The

Basics. Retrieved online Feb 2010 from,

http://www.csoonline.com/article/204450/Business_Continuity_and_Disaster_Recovery_Planning_The_Basics

Strischek, D. (2009, October). Managing Large-Scale Risks in a New Era of

Catastrophes. *Review of medium_being_reviewed title of work reviewed in italics. The*

RMA Journal, 92(2), 66-67,11. Retrieved Feb 2010, from ABI/INFORM Global.

(Document ID: 1844787871).

Watson, J. (1999). Earthquake Hazards – Island of Hawaii. USGS. Retrieved online Feb

2010 from, <http://pubs.usgs.gov/gip/hazards/earthquakes.html>

Wold, G. (1997). Disaster Recovery Planning Process. V5 #1. Retrieved online Feb 2010

from, http://www.drj.com/new2dr/w2_002.htm