



# Disaster Response

Preparing for Disaster:  
An Analysis of Turkcell's Disaster Management System  
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## Introduction

Turkey is at the forefront of disaster risk assessment and response. As a country experienced in responding to natural disasters, it has positioned itself as a leader in the area. The European representative of the UN International Strategy for Disaster Reduction (UNISDR), Paola Albrito said during a visit to Turkey to examine risk assessment policies in August 2013 that *"Turkey is now the most advanced country on risk assessment"*.<sup>1</sup> However, this position was not achieved without experience and careful planning. At the global forum for Disaster Risk Reduction, the Turkish representative addressed this point *"Disaster risk reduction cannot be achieved overnight but by long-term strategic planning and visioning. Turkey prepares strategies and action plans in order to approach disaster risk reduction issues systematically"*.<sup>2</sup> A lot of this comprehensive strategy includes preparing critical infrastructure and telecommunications systems and Turkish mobile networks in particular play a large part in this. Turkcell is the largest operator in Turkey and has extensive disaster management experience. The GSMA Disaster Response team visited Turkcell in October 2013 to learn about its disaster preparedness and recovery plans.

This case study outlines Turkcell's motivation for developing comprehensive disaster management plans, and examines the internal policies and systems in place to deal with disasters and the various internal and external stakeholders involved in crisis management. The case study concludes with a report on how Turkcell successfully managed and mitigated against further disruption in the aftermath of the Van earthquake in 2011.

## Turkey and Turkcell

### Turkey - Disaster Vulnerability Facts and Figures

Turkey is a country of 74 million people that straddles the continents of Europe and Asia. More than 80% of the land surface is rough, broken, and mountainous, and of limited agricultural value. Nearly 85% of the land is at an elevation of at least 450 metres and the median altitude of the country is 1,128 metres.<sup>3</sup> As Figures 1 and 2 illustrate, Turkey is one of the most seismically active countries in the world, situated at the meeting of multiple tectonic plates.

Since 1900, an estimated 90,000 people have lost their lives in 76 earthquakes, with a total affected population of 7 million and direct losses of over 25 billion U.S. dollars.<sup>4</sup> Most of these earthquakes occurred along the North Anatolian Fault, which cuts across northern Turkey from east to west. Many seismologists believe the next big earthquake will strike close to Istanbul with a reported 75% chance that a magnitude 7.0 earthquake will occur within 40 years.<sup>5</sup>

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<sup>1</sup> Excerpt from news article available online at <https://www.afad.gov.tr/EN/HaberDetay.aspx?ID=5&IcerikID=1011>

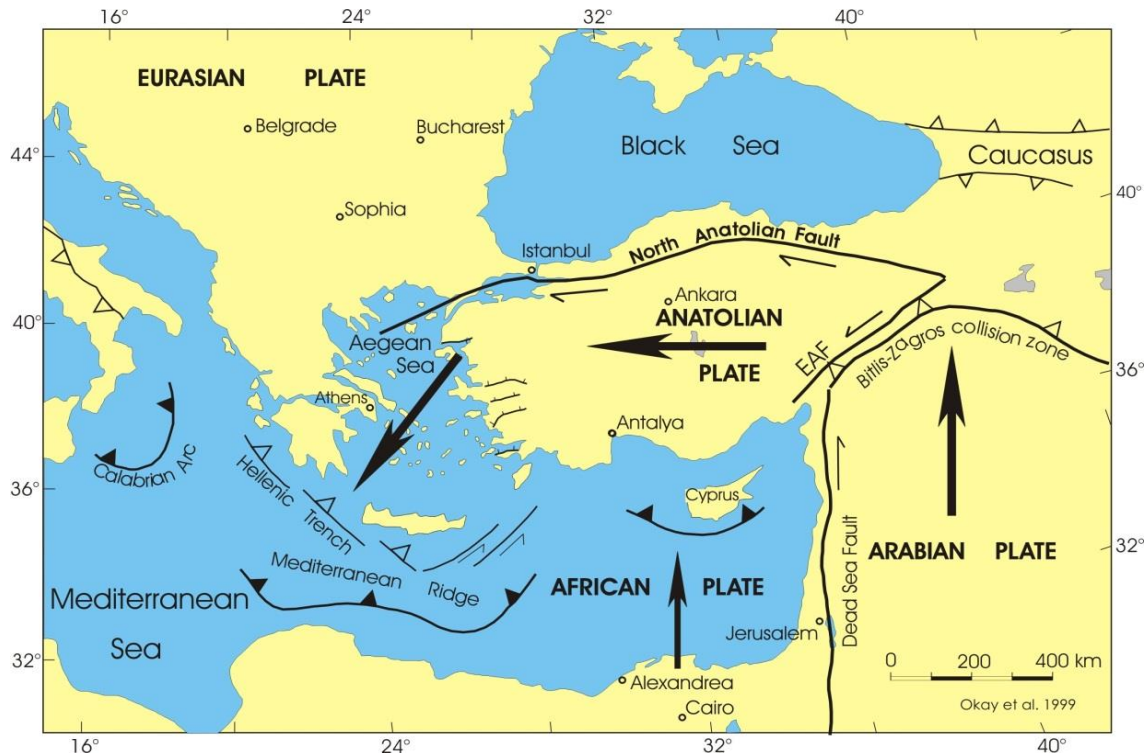
<sup>2</sup> Dr Fuat Oktay, General Director, Prime Ministry, Disaster and Emergency Management Presidency (AFAD) at Global Platform for DRR – Geneva, 2013

<sup>3</sup> Geology of Turkey - [http://en.wikipedia.org/wiki/Geology\\_of\\_Turkey](http://en.wikipedia.org/wiki/Geology_of_Turkey)

<sup>4</sup> The International Disaster Database - [www.emdat.be](http://www.emdat.be)

<sup>5</sup> Turkey Prepares for the Inevitable Big Earthquake - Shigeko Segawa, The Asahi Shimbun Science and Medical News Section 2012

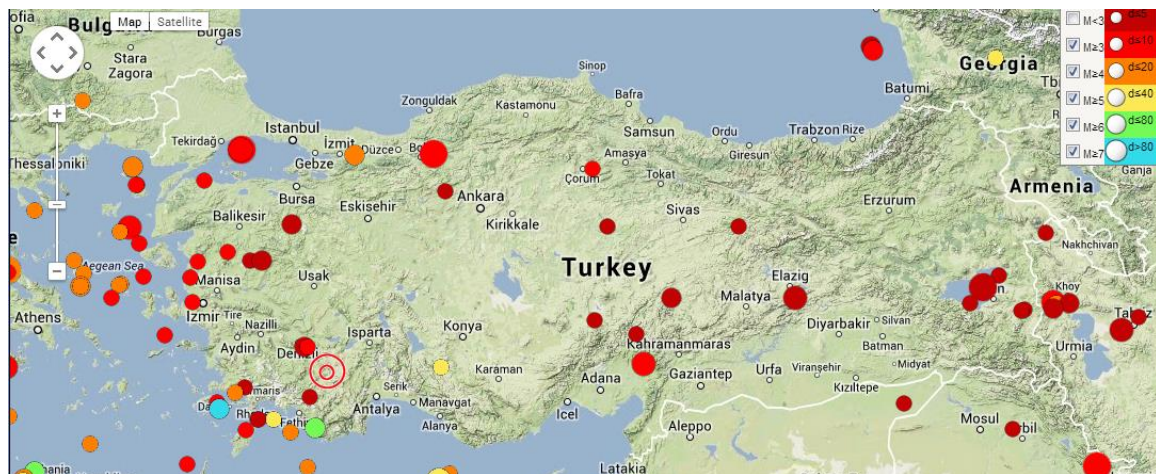
Figure 1 - Map showing the tectonic plates in the East Mediterranean region



### Turkcell – Operator Facts and Figures

Turkcell was founded in 1994 and today has a leading 51% market share in Turkey in addition to interests in numerous other countries. The operator covers 97% of the population and 80% of the land and holds 35.5 million subscribers in Turkey alone. Turkcell was named as United Nations Development Programme's (UNDP) technology partner due to its unique network and innovative applications at the "Innovation and Resilience in Corporate Response to Disaster" event held at the UN Headquarters in New York in April 2013.

Figure 2 - Map showing seismic activity and earthquakes in Turkey during November 2013.



Map shows  $M \geq 3$  only, for clarity purposes. Source: National Centre for Monitoring Earthquakes NCME Turkey

## Evolution of Disaster Preparedness at Turkcell

After a large earthquake struck Turkey's fifth largest city, Adana, in 1998 severely interrupting the business, Turkcell began to work towards making their network and supporting business infrastructure more resilient to such disasters. At first the approach to disaster response was known internally as technical continuity but has since gone through numerous evolutions and improvements. Now, in 2013 and since the Van earthquake in 2011, the structured and business-wide integrated plan is known as the Business Continuity Management System (BCMS). Turkcell BCMS is built in accordance with international standard ISO 22301 and certified on December 2013. The motivation for having such a system is based on a safety first approach, with all business departments involved - from top level management down – and to work alongside governmental agencies such as the Republic of Turkey Prime Ministry Disaster and Emergency Management Presidency (AFAD).

**Table 1 –Turkcell's key products and services and the BCMS objectives**

Key Turkcell Products & Services	MBCO	RTO
Messaging	Deliver 99% of SMS within 15 seconds with 95% success ratio	24 Hours
Internet	Mobile Internet served with minimum speed (e.g. EDGE)	24 Hours
Call	Emergency calls with low quality (e.g. Half Rate)	12 Hours
Societal Services	100% capacity Cell Broadcast service	8 Hours

The aim of the BCMS is to recover the key Turkcell product and services with minimum business objective (MBCO) in pre-defined recovery time objective (RTO). While the last of these objectives concerning societal services is determined by both the public interest and Turkish government regulations the other three are determined by examining legal, customer, financial and reputational data.

### ISO 22301

This ISO standard applies to any type or size organisation in any industry or sector. It provides a framework to meet customer, internal and statutory and regulatory requirements and is the model for business continuity.

ISO 22301 states what must be done; a properly documented BCMS describes how required processes are to be done. These processes require internal audits, verify effective management and ensure that the organisation is fully in control of its activities in addition to allowing a certification body to award a certificate of conformity.



The business impact analysis which led to the objectives set out in Table 1 started with the determination of all the activities which have either a direct or indirect impact on Turkcell's key products and services. After months of data collection and analysis of a total of 1726 activities, 75 activities were prioritised covering five functions:

- Finance
- ICT
- Network Operations
- Consumer Marketing
- Human resources

These 75 activities have in turn been translated into 27 different Business Continuity Plans (BCP). A sample of these BCPs and the various activities included in each is shown in Table 2. The mobile and fixed BCP has the following progression in order of sequence; establish emergency cell sites first and in parallel, fix the transmission between this standalone site and the rest of the network. This allows communications to happen at first within the standalone site and then into and out of that standalone cell. This follows international best practice as people in the affected areas – both emergency responders and victims of the disaster – can coordinate relief efforts and ask for aid as rapidly as possible. Following these activities, the next steps continue and the site is handled by the regional Operations and Maintenance Centre (OMC) and then gradually brought under the control of the central OMC once the other activities are complete.

**Table 2 –Sample of Turkcell business continuity plans and related activities**

Business Continuity Plan	Critical Activities inside the BCP
Messaging Business Continuity Plan	1. Emergency SMSC emergency operation
Mobile and Fixed Stations Business Continuity Plan	1. Emergency mobile base station planning and setup 2. Emergency base station transmission 3. Emergency regional operations partner (ROP) coordination 4. Emergency base station configuration in OMC 5. Emergency existing fixed base station configuration 6. Emergency mobile BTS central operations
GPRS Operations Business Continuity Plan	1. Emergency Corporate GPRS Operations 2. Emergency Consumer GPRS Operations
Roaming Operations Business Continuity Plan	1. Emergency Roaming Operations
Cell Broadcast Business Continuity Plan	1. Emergency Cell Broadcast activities
Emergency Procurement Business Continuity Plan	1. Emergency Procurement Activities

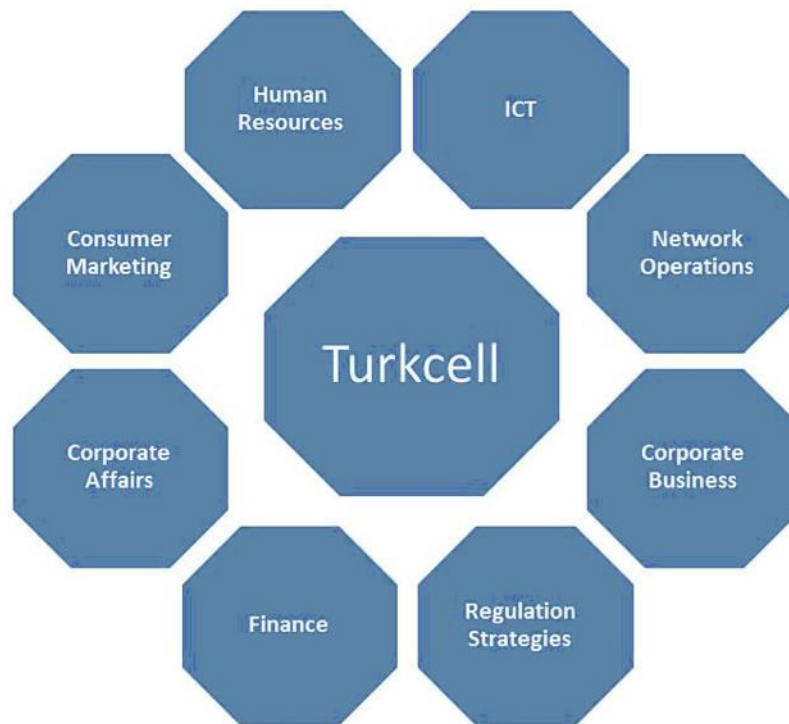


Turkcell Satellite Enabled Mobile BTS operating in the mountains in Van after the Earthquake in 2011



The BCMS team is made up of 136 permanent staff members drawn from the five departments previously outlined along with the additional departments of Corporate Affairs, Corporate Business and Regulation. This is shown in Figure 3. There is a position of Disaster Response Coordinator within each department and regular meetings are held.

**Figure 3 – Turkcell BCM Coordination Structure across departments**



There are strict criteria governing the choice of the Disaster Response Coordinators within each department.

- Coordinators need to be experts on the various systems used within their department
- Coordinators are required to have at least 3 years experience in Turkcell
- The critical role of Network Operations Disaster Response Coordinator requires a minimum of 10 years experience in Turkcell

The BCMS Manager, Tamer Demir, meets with the ICT and Network Operations Coordinators every week to check current functional information and plan around regular operations and maintenance events on their respective systems that must be accounted for if a disaster strikes. For a technology company such as a mobile operator, this information sharing across departments is critical for disaster planning and preparedness. Mr. Demir meets the Network Operations Coordinator twice weekly, the Consumer Marketing Coordinator weekly for the same purpose. Every other Coordinator meets biweekly to reassess plans based on current information.

While understandably the ICT and Network Operations Coordinators play the largest part within the BCMS team, Consumer Marketing plays a large role also. This is because Turkcell take a very active role in communicating to their

subscribers during a disaster. Consumer Marketing is responsible for all communications to Turkcell subscribers, in times of crisis or not. For example in a time of crisis, whilst the network operations team locate and identify the subscribers who are in the affected region, it is the Consumer Marketing team that will determine what actions to take regarding the delivery of relief services such as the granting of free calls or free messages.

**Table 3 –Evolution of Turkcell's BCMS**

Year	Event	Details
1998	Adana Earthquake	
1999	Network Operation BCP Project	Creation of the first BCPs
1999	Marmara Earthquake	
2000 - 2004	Fix System HW on Wall	Minimise the effects of earthquake movements on hardware
2005 - 2007	Disaster Recovery Centre	HLR, Management Systems, Billing & Charging Systems
2007 - 2009	Risk Minimisation on OMC	Increase the number of OMCs 19 -> 27
2007 - 2009	ISO27001 Certification	Certified in 2008
2011	Van Earthquake	
2009 - 2013	Risk Minimization on OMC	Increase the number of OMCs 27 -> 40
2013	ISO 22301 Certification	Certified in December 2013

## Structure of the BCMS

Whatever the disaster, there are four different kinds of scenarios that the BCMS prepares the Turkcell business and staff for. Of course, depending on the disaster, some of these may or may not exist simultaneously:

- Lack of Location
- Lack of People
- Lack of Technology
- Lack of Supplier

The level of severity of these events is linked to predefined alarms levels. The alarms in turn, trigger different BCPs from the BCMS depending on the geographical spread and severity of the events that caused the alarms. These alarms are aligned with the national alarm definitions as defined by AFAD.

- Red: National. The incident is handled by government bodies.
- Orange: The incident is handled with the help of other Business Functions or Turkcell Group companies
- Yellow: The incident can be handled within a single Turkcell functions.



Depending on the incident there are different management flows and management locations with pre-planned and practiced procedures for issues such as employee safety and media communications contained within the BCMS documentation and plan. Furthermore, roles and responsibilities for managerial staff members have been assigned and there are multiple methods to contact each key person - Turkcell cell phone, other operator cell phone, fixed line and satellite phone.

## Consumer Marketing

The consumer marketing department has a number of systems in place to deal with emergencies. One example is the Earthquake Information Service which sends text alerts to all Turkcell subscribers in the affected area if an earthquake occurs. Another system which builds on this is the Reach Me service which is extremely useful for parents as it sends their child's location to them via SMS if an earthquake occurs. Missing persons and the reporting of such is a major issue after all disasters so this simple service can be very effective as parents seek to locate their children in panicked circumstances. These types of relief services offered by the consumer marketing department are not just limited to subscribers at home in Turkey, there is also a customer care disaster service for those who are roaming abroad. It is another example of where the constituent teams within the BCMS work together. The teams collaborate to identify and locate subscribers in a disaster stricken area and offer free calls, free SMS and reactivate suspended accounts. There is also direct contact made from Turkcell to determine the well-being of those in the affected areas. These are called *care SMS* and *care calls*. Incoming calls to the call centre from the affected area are also prioritised.

As an example of this service for roamers, on July 22<sup>nd</sup> 2013 there was an earthquake in China measuring 6.6 on the Richter scale. The following sequence of time-stamped events displays the reach and efficiency of this customer care disaster service.

- List of the 1069 Turkcell customers roaming in the affected area of China was identified 21 minutes after impact.
- Previously suspended accounts were reactivated after 32 minutes (mainly customers who had missed payments). The suspension was lifted for a period of 15 days.
- Free Calls and SMSs were automatically given to the 1069 subscribers after 30 minutes.
- Social Media communication campaign with details and information on the event started after 30 minutes.
- Customer Care completed their *care calls* within 6 hours and 8 minutes.

These calls are an important part of the service for roamers who are in a disaster region since call analysis takes place and the urgent ones are directed to AFAD for further action. Non-urgent requests such as those to inform their relatives of the well-being of their loved ones are also handled by Customer Care on behalf of the subscribers.

The total statistics for these consumer marketing activities in 2013 was:

- 10,000 care calls made
- 500,000 free minutes granted

- 1800 suspended-line reactivations 1.8million post-disaster positive comments on social media

## Emergency Procurement

One of the most impressive and forward looking aspects of Turkcell's BCMS is their Critical Needs and Suppliers list and how this comes into play once a disaster occurs. Quite apart from the stored availability of mobile network equipment or emergency shelters for critical staff, procurement in times of emergency can be a major obstacle to efficient disaster response unless shortened processes previously exist. Turkcell, like many operators, have a six step procurement process under normal circumstances, governed by the Finance department. In times of crisis, this process can be shortened to just three steps with an auto-refilling limit to the expenditure. This limit and auto-refill is important since firstly, it recognises the need for streamlined emergency procurement of goods or services and secondly, provides a control mechanism for these shortened processes to protect against abuse and ensure the process remains secure.

Figure 4 – Differences between regular procurement process and BCM procurement process



Furthermore, there is a list of 46 critical suppliers (and alternatives to these) who can be contacted to supply everything from generators and radio equipment for communications purposes to boats, helicopters and travel agents for transport purposes, as well as suppliers of bedding, water and emergency food rations for basic survival purposes. Each listed item in the database has the need satisfied, the product or service in question, detailed explanations as to its purpose, location of the product or service and two Turkcell and Supplier contacts. This list is checked and updated every year.

## Local Knowledge

Suppliers local to the region in question are preferred in particular for site works and for tower and energy line purposes. Quite often, local suppliers have the necessary regional knowledge and their own networks required to gain access if transport infrastructure is down or to ask for extra help is required. A supplier travelling a great distance with key equipment may fail as a result of this simple lack of knowledge. This is particularly true in Turkey since it is mountainous with difficult terrain in many parts of the country, as stated before. This approach to building a critical

supplier list further highlights Turkcell's lessons learned from past disasters and their detailed approach to an effective and broad reaching disaster plan.

### **Power Issues and Fuel**

One of the most common but simple shortages that MNOs experience after a disaster is fuel for their generators. Globally speaking, in such situations fuel becomes under the control of many other parties such as the army or the government. In Turkey however, Turkcell have reserved 200,000 litres of fuel in both Western and Eastern Turkey using two different suppliers. This is the upper limit allowed before requiring a licence of fuel distribution.

### **Critical Suppliers' Compliance with BCMS**

All of the 75 activities previously identified, which form part of the 27 business continuity plans have contingent critical needs that these suppliers can meet. This of course, begs the question: are the suppliers themselves disaster prepared? Turkcell have taken their BCMS plans and examined their suppliers for compliance with their own policies. They did this through a process known as the Turkcell Group Business Continuity Management Supplier Survey and Audit. The importance of this process was outlined by Tamer Demir *"Turkcell is preparing for disaster and emergency situations across its entire business. We have identified our critical suppliers, those which could affect Turkcell's delivery of its key product and services. To this end we have put some liabilities for business continuity in the critical supplier's contracts. Each of them has completed a business continuity survey and we audit the ones which have high importance but perhaps a low maturity for Turkcell's business continuity"*. After analysing the survey and audit results Turkcell insert business continuity requirements to the suppliers' contracts.

### **Partnerships**

As the area of disaster response and preparedness grows within MNO business units, it is vital that best practices and lessons are shared across the industry. Bilateral meetings and information sharing takes place between Turkcell BCMS team and their peers in AT&T, Starhub, KDDI, Deutsche Telekom and Cosmote.

While information sharing across the same industry is important, cross-sector partnerships building and disaster planning in advance of a disaster can help all humanitarian stakeholders to harness the power of mobile before, during and after crises. Emergency responders, INGOs, regional and national governments and the armed forces all play substantial roles in disaster response.

Turkcell have worked in partnerships with universities, AFAD and emergency response teams from various agencies, both locally and internationally, to have a structured and coordinated approach to Turkish response programmes. These partnerships involve sharing lessons in meetings, workshops and conferences and can also involve disaster exercises. These exercises can be with Turkcell's corporate customers, other MNOs, fixed-line operators and the government. As mentioned previously, Turkcell work closely with the UN, in particular the UNDP. The UNDP have identified Turkcell's network initiatives, innovative technology applications and its employees' training and



preparedness as representative of a disaster response partner. The two organisations are working together on technological solutions that could be used before, during and after disasters.

## Disaster Simulations

### Turkcell

Every six months Turkcell run a disaster simulation; one of which will be an informed exercise involving up to 1200 staff members, the other an uninformed or surprise exercise. The last informed exercise was a hypothetical double event where an earthquake struck Bodrum, a tourist town on the Aegean Sea and hours later an earthquake hit Indonesia where many Turkcell subscribers were roaming. Staff members had to deal with simulated lack of infrastructure, loss of life at home in Turkey and then divide attentions to their roamers in Indonesia.

The last uninformed exercise was a scenario in which a truck carrying hazardous material in Istanbul crashed, resulting in a large fire and the release of noxious gases. Staff members in one Istanbul region were informed at 10pm on a mid-week night to work from home the next day as a result. Staff members across all departments are fully equipped to carry on business as usual despite this last minute change of plans.

Without extensive planning these exercises would not work. Insights gained from inefficiencies observed during the simulations and the subsequent response, are fed back into the plans to tighten up processes. Furthermore, although these simulations were mostly internal to Turkcell, they helped strengthen partnerships that exist as part of the BCMS; across the various business units in Turkcell (and others in the Turkcell Group) and also those partnerships with external agencies like AFAD and the fire service. Various plans and systems are practised during the simulations; in times of real disaster these partnerships then become tangible and the results are of benefit to all stakeholders.

### Nationwide

There are 34 different clusters within the AFAD Response unit, including medical, housing, food and finance clusters. The telecommunications cluster is made up of all providers in Turkey; fixed line, mobile, satellite and IP. In conjunction with the municipality, civil defence, the police and the fire services, cluster disaster simulations are held at least once a year in Istanbul. This is part of the plan to mitigate the effects of the large earthquake which seismologists expect to strike Istanbul in the next 40 years. The GSMA Disaster Response team was invited by Turkcell to attend the October 2013 simulation.

Each member organisation of the cluster attended a large field site with their various disaster personnel, network engineers and mobile equipment. AFAD with the aid of the city council ran the simulation and detailed the size of the earthquake, the number of casualties and the level of damage to infrastructure. Stage by stage and one by one the various telecommunications providers came onto the field and brought their networks live; whether by establishing



Turkcell at the Istanbul earthquake simulation  
– a Mobile BTS undergoing set-up

satellite links to set up a mobile cell site, provide a bridge for broken optical cable or installing fixed line network to be used by affected populations. Minimal details were provided in advance of the simulation and each provider had to solve their own individual trial as fast and as effectively as possible.

This was just an inter-cluster exercise. A cluster-wide simulation is planned for 2014 when hundreds of personnel will together simulate response efforts. Although Turkcell play just a part in this, alongside many other organisations drawn from the public and private sectors, this is a progressive attitude to disaster response that positions Turkey at the forefront of risk assessment and response.

## Business Continuity Management: Network Operations

### Network Design

Every mobile operator has designed their network to be redundant and load-shared to cope with outages and the inevitable resultant congestion. For mobile operators in countries that are prone to disasters, the network design becomes an even more important issue. The primary concerns in this area are:

1. Robust antenna and transmission tower design to reduce the loss of radio equipment
2. Correct adherence to building standards to protect the integrity of core network elements in their data centres
3. Innovative network design to minimise the number of single points of failure (SPOF) in the transmission backhaul

Turkcell have met these technical challenges head on with a solution or work-around for each:

1. Antennas are distributed on both rooftops and on ground-fixed towers to spread the risk of collapse in the case of an earthquake.
2. OMCs and their attached data rooms are critical facilities and are designed to remain operational after a major earthquake. This entails additional special requirements for both building design such as steel bracing to resist lateral forces as well as base isolation to minimise the transmission of forces from the ground to the building as the earth moves. Hardware and equipment housed in such building are fixed to the wall using multiple connection points and straps are used to prevent items from falling over.
3. The GSM network backhaul uses IP and MPLS over optical fibre as these protocols have inbuilt resilient features. Every fibre element of the backhaul has a redundant back-up fibre at each point of interconnection and the routers are dual homed to further decrease the chance of failure. The most critical fibre interconnect points are also backed-up with microwave links so that in case of failure of the fibre network, the GSM network can still operate on microwave.



## Network Equipment

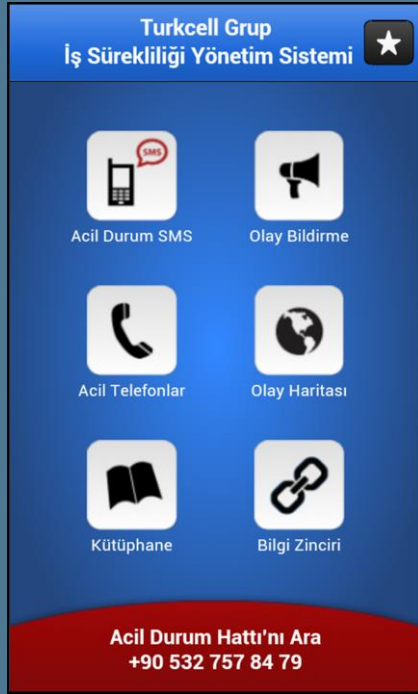
Alongside the resilient nature of the network design itself, there are many supplementary and mobile technical units (satellite and non-satellite based mobile stations, mobile MSC, mobile life containers) that form part of Turkcell's BCMS. On the core network side, MSCs and BSCs can be replaced by a container housed unit as can the HLR. The critical HLR containers are running in *warm stand-by* on the network and are backed-up every hour to ensure current subscriber information in the event of a disaster and the ensuing requirement to bring the stand-by HLR live on the network. (It is worth noting that a trucking and logistics company is one of the critical suppliers referred to in the section on emergency procurement).

On the radio network side, there are mobile units that can take the place of a damaged base station or transmission tower. In addition there are many mobile satellite-based stations distributed all over Turkey that can provide local connectivity in the case of a failure of the transmission network in a particular region. Turkey is divided into 16 regions, from a Turkcell radio coverage perspective. There are nearly 100 of these mobile stations to be used in case of emergency or disaster. The mobile stations are distributed across the 16 regions such that the first mobile station can reach the disaster area within 2 hours. The location of the emergency network operations equipment by region is determined by the risk of earthquake, population density, call traffic and distance factors. Spare BTS units, again housed in tough and durable truck containers, make up the store of radio equipment in the BCMS.

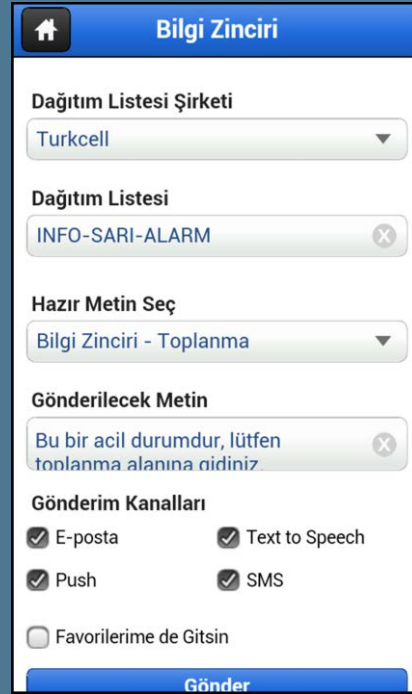
There are also technical containers that can be used as temporary OMC centres in the event of building collapse. These containers contain all the equipment needed to quickly establish and run a network operations centre hub. They come fully equipped with laptops or computers, data lines, generators and uninterruptible power supplies (UPS), fixed line and satellite phones in addition to desks and chairs.

A separate range of life containers come with plumbing for washing facilities, kitchens and bunk beds. These units were brought into service immediately after the Van earthquake in 2011 as both staff members and their families were given somewhere safe, clean and warm to live. This safety first attitude to their employees is evident throughout the BCMS but this is perhaps the clearest incidence. Turkcell understand that staff members will find it difficult to perform their duties while family concerns remain.

## TURKCELL GROUP BUSINESS CONTINUITY MANAGEMENT MOBILE APP



App Home Screen showing the different functions: emergency SMS, event notification, emergency phone- calls, event maps, library and information chain



Call Chain function showing the various means of pushing an emergency message to a list of recipients

Turkcell have developed a BCM App to aid their employees across the Turkcell group. The next plan is to roll this App out for critical suppliers in addition to staff with a long term view to making it available to subscribers. The App is designed to work offline and functions as a tool for disaster notification and reporting, emergency contact mechanisms and has library of processes and information for disasters.

- An emergency IVR/SMS tool that sends message to the internal emergency services
- Users are notified about disasters both inside and outside of Turkey. These notifications are taken from GDACS international site and the NCME in Turkey.
  - 5.0+ on the Richter scale for Turkish events
  - 7.0+ on the Richter scale for international events
- Users can announce events such as earthquakes, terrorism or other natural disasters by uploading pictures and adding some details.
- The call chain functions as a message sent to previously registered contacts using SMS, email, push notifications and text-to-speak. Up to 8 contacts can be loaded into this tool.
- The library contains all Turkcell functional disaster plans as per the current BCMS.



Emergency Response teams search for survivors in a collapsed building after the earthquake in Van



## Van Earthquake

On October 23 2011, a 7.2 magnitude earthquake hit the Eastern Turkey city of Van. 1 million citizens were affected in the region including about 300,000 Turkcell subscribers. Within twenty minutes the event was national news as voice traffic on Turkcell's network soared to four times its normal rate. 5 cell sites were completely destroyed as the buildings they were on collapsed; in total 35,000 buildings were destroyed in the region. The lives of 120 Turkcell staff were impacted through death, injury or loss of property and belongings and overall, 230 2G and 3G cell sites were affected through a variety of power and transmission problems. Turkcell is the strong market leader in this region of Turkey and was the only mobile network available in many locations after the disaster.

The Van Crisis Management Centre was operational within minutes; support personnel and mobile BTS units arrived later that day. The unaffected BSCs and RNCs were rehoused to different parent MSCs in order to free up additional processor capacity in the main MSC serving the area. Technical parameters and resources - such as making all calls at half the regular sampling rate in order to double the effective available bandwidth - were changed remotely from Istanbul at the request of the local Van crisis team.

In total 12 mobile BTS were deployed within hours – 8 in the neighbouring town of Erçis and 4 in Van itself – and over the next few days 16 new permanent 3G sites were installed and brought live to replace the lost sites. As is usually the case when the national electrical grid is affected by disasters, power issues were a huge concern for the network operator. Battery back-up at the time for sites in the region was around 4 hours (it has since been increased to 10 hours) and there were 40 generators being rotated amongst 100 sites.

This entire effort put an incredible strain on network and field operations teams; long arduous hours adding to the emotional difficulty of loss of life and property. 100 Turkcell employees lived in the temporary living containers situated at the OMC in Van and Turkcell staff from different regions rotated in and out to help the local teams.

All of these activities had been part of disaster preparedness measures planned for and practised through the BCMS. Ensuring staff and their families were safe, getting key personnel and equipment back on-site and bringing the network back as fast as possible ensured that both people and emergency services could communicate as fast as possible. AFAD set up two relief stations right at the location of the Turkcell mobile BTSs as the mobile stations became a social hub in the city.

760 people died as a result of this earthquake and a subsequent earthquake in the same area later during the month of November. Turkcell were active in preventing this number from increasing further; alert Turkcell staff noticed that there were a large number of texts being sent to the emergency number (instead of calls) from their network. The Turkcell teams worked with the telecommunications regulator to enable Turkcell to aid emergency responders in locating the source of these calls. In total 65 people were successfully dug out from the rubble where they had been previously

trapped. In this instance alone, the combination of trained and alert network staff and an enabling regulatory environment allowed emergency responders to access victims they may not have found without the mobile network.

## Rebuilding Van

The activities were not limited to relief efforts in the immediate aftermath of the disaster and the rebuilding of the Turkcell network. 76 of the 760 people who died were teachers and for a region already economically deprived, the further migration of people and loss of job prospects could have resulted in even more deprivation. Turkcell established the Turkey's Moneybox for Van project in order to help rebuild educational campuses and donated 2.5 million USD. Turkcell initiated this national fundraising campaign to mobilize further resources focused on providing housing for more teachers. To manage this campaign Turkcell developed a partnership with Turkish Education Foundation (TEV). In two months, an additional 2.2 million USD was raised through a variety of donations – subscribers, companies and individuals – giving a total of 4.7m USD. Part of the money raised was spent on building living quarters for 192 teachers, a dormitory for 132 high school students and on creating scholarships for 100 students, ensuring that education could continue for affected populations. Furthermore in collaboration with Turksat, a call centre in Van for the Ministry of Education (MEB) was opened which employs 120 people, 50% of whom are disabled, and 95% from among earthquake victims in Van.

Efforts such as these represent the changing face of disaster preparedness and humanitarian action, one where technology and technology companies play a large role. As GSM mobile networks are one of the most common means of communications for people worldwide, mobile operators are starting to take a long term view of their own role to play both for their business, their subscribers and the wider community. The recently published World Disasters Report 2013 has as its focus this exact area; technology and the future of humanitarian action<sup>6</sup>. It states that the development of a more technology-oriented approach to humanitarian action is essential to take advantage of the opportunities to improve coordination, action and fund-raising. Without cooperation from mobile phone operators, it is impossible to achieve this.

## Conclusion

This case study details the preparedness and response activities taken by Turkcell and provides an analysis of their experiences in dealing with natural disasters, especially earthquakes. Each natural disaster is different and presents a unique set of challenges which cannot be fully planned or prepared for. However, in order to minimise the impact of a disaster on business operations, preparation is critical. Having a disaster management team in place that has built partnerships, established processes and run disaster simulations is fundamental. This team can help enormously in minimising impact upon the business and meeting the challenges presented when disaster strikes. What Turkcell has done extremely well is to learn continuously from its own experiences and those of their country. Through internal and

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<sup>6</sup> World Disasters Report 2013 - Focus on technology and the future of humanitarian action

external feedback mechanisms with their various partners and regular planning meetings they have shown attention to detail and invested highly in protecting the lives of their staff, the wellbeing of their subscribers, their business assets and the Turkish community at large. In summary:

### **Disaster Preparedness Team**

The existence of a cross-functional disaster preparedness team is fundamental. The team is responsible for putting the processes and plans into action once disaster strikes. The senior roles within this team must be carefully chosen to reflect their importance; experience, knowledge and capacity to perform under pressure. The team should also have a stable structure.

### **Regular coordination, communication and points of contact**

The disaster preparedness team must meet regularly to ensure continuous dialogue and to discuss and establish roles, responsibilities and guidelines for engagement in disaster scenarios. Furthermore, in a mobile operator environment which is dynamic by its very nature, the critical functions of network operations and ICT are required to be fully communicative with regard to all new development within the business.

### **Disaster Simulations**

Running both informed and uninformed simulations to put into practice emergency processes is also critical to the success of the plans in a real disaster. It gives operator staff experience of reacting to disasters, working under that type of immense pressure and training in what the hierarchy of procedures is. Furthermore, the simulations strengthen partnerships across the departments within the mobile operator and those with external agencies. Lastly, simulations furnish the disaster preparedness team with observations and data which they can feed back into their existing plans to fine tune them for efficiency.

Turkcell have helped pave the way for other operators around the world to develop similar plans and build effective partnerships in their own countries. Given the recent Typhoon Haiyan in The Philippines which decimated entire cities and the massive role that the Filipino mobile operators played in the humanitarian response, it has never been more pressing for the mobile industry to help change the face of disaster response and humanitarian action.



#### **About the GSMA Association**

The GSMA represents the interests of mobile operators worldwide. Spanning more than 220 countries, the GSMA unites nearly 800 of the world's mobile operators with 250 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and Internet companies, as well as organisations in industry sectors such as financial services, healthcare, media, transport and utilities. The GSMA also produces industry-leading events such as Mobile World Congress and Mobile Asia Expo.

For more information, please visit the GSMA corporate website at [www.gsma.com](http://www.gsma.com). Follow the GSMA on Twitter: @GSMA.

#### **About Mobile for Development - Serving the underserved through mobile**

Mobile for Development brings together our mobile operator members, the wider mobile industry and the development community to drive commercial mobile services for underserved people in emerging markets. We identify opportunities for social, economic impact and stimulate the development of scalable, life-enhancing mobile services

#### **About the GSMA Disaster Response Programme**

The GSMA Mobile for Development Disaster Response Programme will work with mobile operators to determine how they can most effectively support each other and improve preparedness and resilience among networks in disasters. The programme will also identify how the mobile industry can best help affected citizens and humanitarian organisations on the ground following a crisis. We believe that when you restore the mobile network, you rebuild the human network.

#### **Contact**

For more information on the GSMA's Disaster Response Programme, please contact us on [disasterresponse@gsma.com](mailto:disasterresponse@gsma.com) <http://www.gsma.com/mobilefordevelopment/programmes/disaster-response>