YODELME IN THE REGIONAL DISTRICT OKANAGAN-SIMILKAMEEN: SPRING 2018

Contents

Executive Summary

The Regional District of Okanagan-Similkameen (RDOS) opened an Emergency Operations Centre (EOC) in 2018 to cover the entire southern Okanagan, some 10,000 square kilometers, to respond to the Spring 2018 freshet.

The EOC managed a number of concurrent emergency situations distributed over this large area, with resources deployed from municipalities, private contractors and government agencies from B.C. and Western Canada. As the number of emergency situations, responders, and contractors grew, the EOC realized that effective communications was becoming a weak link that had to be addressed.

Implementing effective Field Communications Technology in Emergencies

The RDOS engaged YodelME, a field communications and safety company, to quickly provide effective field communication. This involved:

1. Adding YodelME communication specialists to the incident command structure.

2. Within the first 10 days, providing YodelME based field communications for 80 field-based team leaders (crew chiefs, strike team leaders, contractors and additional personnel).

3. By the project's end, enabling field communications for 159 field-based team leaders managing some 800 individual in-field workers.

4. Recording over 12,000 messages, about 5,000 of which were safety check-ins, status updates and resource requests. These structured text messages are visible to field workers and to decision makers who use the dashboard.

5. Providing dashboards for each team in the EOC, enabling team chiefs to monitor and effectively communicate with field personnel.

Benefits of Effective Communications Technology

The key learnings demonstrated benefits of employing effective communications technology while managing emergencies included:

1. **An effective, standardized, communication tool for all emergency staff**. Even when they were available, traditional communication tools such as cell phones, landline phones, radio, and word of mouth created fragmented and unrecorded communication, prone to bottlenecks, that ultimately could not be managed efficiently.

2. **Enhanced situational awareness for all personnel**. EOC leadership and staff quickly realized they could use YodelME mapping to accurately determine where their resources were located, receive more frequent and reliable status reports, and flag emerging issues all on one platform.

3. **Improved decision making** as a result of the improved situational awareness. Several critical decisions were made based on real-time YodelME communications, and with full knowledge of the situation.

4. **A regulation-compliant and efficient safety check in and reporting system was achieved.**

5. **Reduced costs** based on knowing the required and actual deployment of resources, equipment, and materials.

6. **A verifiable record of field-to-EOC communication and contractor deployment**. YodelME's resource tracking records were, after the incident, used to verify the accuracy of contractor invoicing which is a perennial issue in emergencies that, when rectified, can dramatically alter costs.

Recommendations: Preparing for the Next Emergency

The above benefits were achieved even though staff and contractors had no prior experience with YodelME, and in spite of YodelME's initial deployment occurring after the emergency situation had progressed to a very challenging state. Even greater benefits and faster deployment can be achieved if emergency organizations prepare in advance.

Any organization responsible for managing emergency response can be better prepared for their next emergency by implementing the following recommendations:

1. Develop an Emergency Field Communications plan that identifies the technology and processes you will use.

2. Proactively integrate Field Communications into your Incident Command structure.

3. Train all necessary EOC employees on the plan and core communication processes prior to the emergency.

4. As appropriate, utilize the communication technology and processes in your year-round field operations to maintain training levels.

5. Establish a mandatory communication policy for all emergency personnel/contractors in advance and mandate this on day-one of the emergency.

6. Develop processes for recording accurate deployment schedules for all personnel and contractors. Validate these schedules against actual activity in real-time, immediately identifying discrepancies and deviance from plan.

7. Similarly, develop processes to plan, record and track deployment of equipment and material resources in the field, thereby avoiding redundancies and unnecessary costs.

8. Contractually require contractors to use the same communication platform and deployment processes used by staff, thereby avoiding unnecessary costs and improving the accuracy of invoicing.

Foresight and investment in these practices will increase operational effectiveness, reduce losses during emergencies, improve safety, and substantially reduce costs.

Introduction

This report summarizes innovations that took place within the Regional District of Okanagan-Similkameen (RDOS) Emergency Operations Centre (EOC), with an emphasis on the use of YodelME, a communications and safety platform for communication in challenging field operation conditions.

Coming into the spring of 2018, the RDOS wanted to enhance its preparedness levels for emergencies in the region. This goal was founded on four overarching realizations.

#1 - Emergencies Are the New Normal:

Measurable and significant changes have occurred to the climate. These changes are resulting in abnormal weather patterns, which are creating small- and large-scale emergencies on a more frequent basis. As such, it is expected that British Columbia will be dealing with more frequent and larger emergencies than in the past.

#2 - Public Expectations are Increasing:

The residents of British Columbia have increasing expectations of the government's ability to effectively prepare for, respond to, and recover from large scale emergencies. This has put more pressure on the RDOS to meet heightened expectations and show progress.

#3 - Continuous Improvement is Possible:

Significant benefits can be achieved by developing a multi-year plan for personnel and resources. This would allow operational protocols, communications infrastructure and management tactics to be transferred from one event to the next, enhancing efficiency and promoting better decision-making; both critical to creating year-over-year improvement in emergency response.

#4 - Improving Communications is Critical:

It is well understood that efficient communication with field staff is essential to provide efficient and cost-effective emergency response while safeguarding responders, human

life, property, livestock, and ecosystems. It used to be inevitable, and hence acceptable, to have communication gaps during emergencies. But technology is now available to effectively provide communications throughout an emergency, even in the most remote areas.

At the same time, the RDOS wanted to implement the relevant recommendations published in the recent *BC Flood and Wildfire Review* for the 2017 season. Many of these recommendations were focused on achieving greater integration between a complex array of organizations, personnel and resources to reduce redundancies, enhance efficiency and enable greater situational awareness.

The Logistics of Emergency Response

The Complexity Problem

The 2018 freshet caused significant high-risk flooding at numerous incident sites spread over a region spanning 10,400 square kilometers. Considerable resources were mustered. For example, one million sandbags were used, and over eight hundred workers were sent into the field. Because a large-scale, rapidly evolving response was needed, expenses quickly ran into the millions of dollars.

As an emergency grows, the complexity growth is not linear but exponential. Incident command faces an increasingly difficult time deploying resources effectively and achieving the desired outcomes.

Emergency managers, and the public, often believe that applying more resources is the key to managing emergencies. However, at a certain point, each additional resource has diminishing returns, clarity is reduced, and momentum is lost. But costs continue to increase.

Organization, process, and reliable communications are the key to being able to maintain the speed, flow and direction of a response.

Resource tracking becomes a critical challenge as the complexity of an event ramps up.

As the emergency response ramps up, personnel working inside an EOC are forced to consider a large number of factors that affect their decision making. There is often little certainty regarding these factors. Emergency managers must consider:

- The number of different threat situations, how significant each threat is, and how quickly it is evolving. For example, 14 different threats were identified by the RDOS EOC.

- The number of resources available, the rate at which the resources need to be replenished, and their distribution across the affected region.

- Whether the EOC has direct control over those resources, or whether those resources are at risk of being withdrawn, reassigned or exhausted before the emergency response is finished.
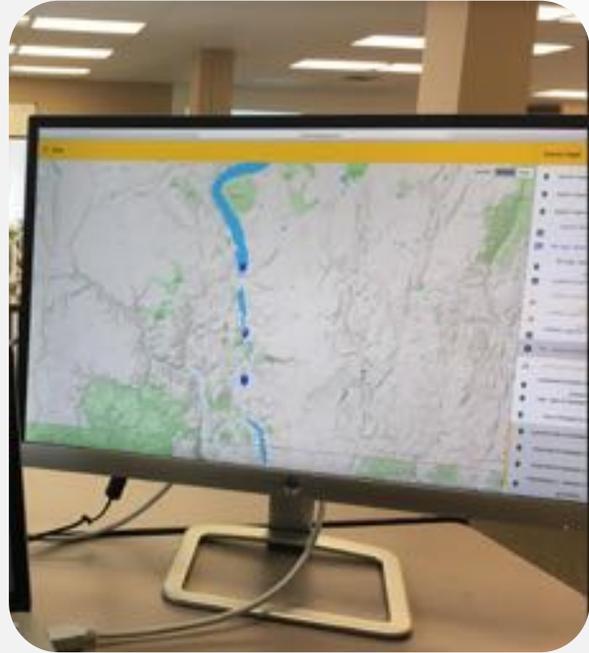
- Whether a worksite is WorkSafeBC compliant. Responder and public safety is always paramount. Non-compliant sites must be remediated before they can continue operating.

- How to collect, verify, analyze and interpret information coming in from multiple channels and sources, including via the general public.

- Whether contractor and material expenditures are warranted.

- Whether unforeseen obstacles will hinder operations.

Under these circumstances, it is impossible for an Incident Management Team (IMT) to effectively manage a quickly-evolving emergency without first establishing and adhering to proven operational protocols to address the complexity and communication issues.

New innovations have enabled IMTs to react to emerging developments in real time.

RDOS's IMT recognized both the dangers of complexity and the potential benefits of bringing in outside experts and communication technology that could enhance control. The IMT was able execute their plans, make micro- and macro-adjustments as the incidents unfolded, and rapidly restore the speed, flow, direction, safety, accountability and productivity of resources.

Responding Quickly to Emergencies

The RDOS sought to embrace innovative approaches in its EOC to respond to the 2018 freshet. By leveraging new technologies, the EOC was able to create a more effective decision-making process and augment its effectiveness. The RDOS was able to reduce the delay between the time information is received and action is taken using the *OODA Loop* shown below.
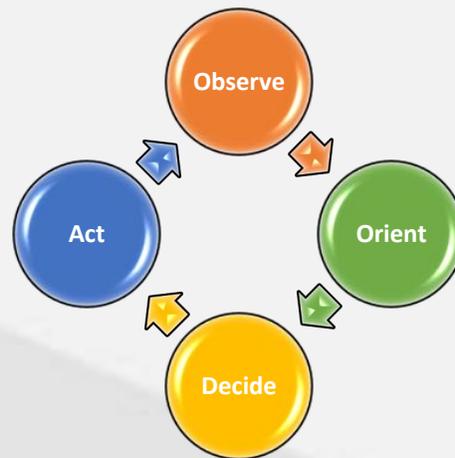
Observe:

The EOC received reports and status updates from a wide variety of sources, including technical specialists from multiple scientific areas, crews and contractors working at sites across the region and the general public. It used these reports and updates to build a comprehensive understanding of the field of operations.

Orient:

Staff in the EOC analyzed and interpreted the observational data to form a shared perspective. This shaped the decisions that it would make.

Decide:

Relying on observations and data analysis, the EOC formulated decisions designed to distribute personnel and resources where they were needed most. In addition, redundancies, overlaps and unnecessary costs were avoided by integrating continually updated information.

Act:

Field personnel carried out orders from the EOC. The results of these actions fed into the observations of the next OODA loop.

An example of the OODA loop at the EOC:

Observe: Shuttleworth creek breached its banks and established a new channel through a residential neighborhood.

Orient: The EOC received direct information from field personnel, drones and the public combined with input from hydrology experts.

Decide: Rather than sandbag the new channel, the EOC opted to return the creek to its original channel.

Act: Crews and contractors assembled, and Shuttleworth creek was successfully returned to its original channel.

The communication technologies utilized by the EOC allowed staff to make real-time adjustments to its OODA loop.

Assessing Innovative Approaches

The EOC decided to innovate based on:

- A highly complex emergency
- The need to be agile and respond quickly
- Public expectations around improved emergency management

YodelME offered an immediately applicable, cost-effective solution. A YodelME response team was invited into the EOC with the following goals:

- Provide a robust safety protocol to safeguard the lives of response personnel
- Allow effective two-way communication for all emergency personnel
- Facilitate highly effective, real-time situational awareness of events in the field
- Identify where resources were at any given time in the field
- Create an integrated communications network to streamline communications and take pressure off traditional channels
- Ensure connectivity in challenging environments with no cell phone coverage
- Eliminate cases in which the EOC misperceived its allocation of assets
- Encourage greater accountability from contractors
- Assist in optimizing the overall efficiency of the EOC
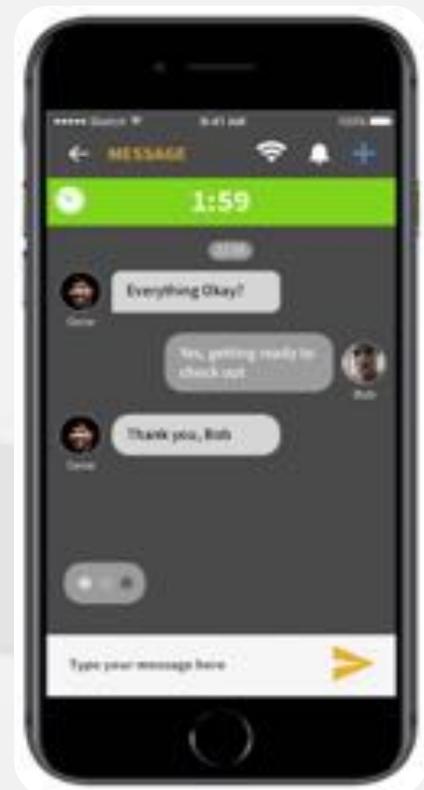
The YodelME app enhances safety and streamlines communication

By deploying the YodelME service and technology, RDOS was able to implement recommendations from the *BC Flood and Wildfire Review*, which stressed that "Governments should be considering, assessing and testing" solutions that could be effective in emergency response.

Implementing YodelME communications was a progressive and necessary step for the RDOS because of the process in which the initial flood response was handled. Individual municipalities had hired contractors and equipment, deployed resources and made important decisions, after which they transferred ownership of the response to the EOC without providing tracking, accountability or safety measures. The EOC recognized that a solution was necessary to address this complexity. Ultimately, the YodelME team was integrated into the Incident Command Team as Resource Unit Leader to provide a complete picture of resources and communication.
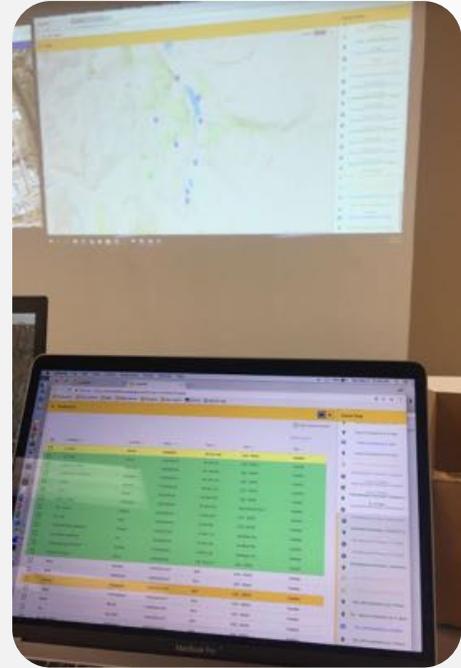
The powerful backend integrates all team communication, mapping and reporting.

Benefits of better Communication

Structured Communication

The YodelME "dashboard" was installed on individual monitors for the section chiefs. Operations personnel could then see who was working at each site, and they could request status updates from individual workers. This immediately created a dynamic communications environment that was structured for ease of use and efficiency.

In the face of disasters, incident commanders are often unsure of where their resources are actually deployed at any given time. This was initially the case for the EOC as well. In one example, Operations, Planning and Logistics personnel believed they had multiple crews working at a high-risk site called Twin Lakes. However, after reviewing the YodelME activity-mapping feature they learned that, in fact, the crews in question were working at a completely different site. This immediately set off a chain of events to redistribute crews according to the most pressing needs.

Dispatching resources to the right place at the right time is another common problem in disasters, and the 2018 freshet was no exception. As the disaster unfolded, crews ran short of resources such as sand. In one instance, military crews working at the Twin Lakes site realized that water levels were threatening to overwhelm the gabions topped with sandbags. There was no sand on site, and they had no idea whether more sand was on its way. The sergeant on site did not have the phone number for the EOC, and was out of cellular coverage. But he was still able to his YodelME app to send a yodel to Logistics. The yodel was delivered through YodelME's satellite capabilities. His request was picked up immediately by the EOC, and the required sand was quickly located and set up for delivery. A reply communication to the sergeant confirming that sand was on its way deescalated the stress level at Twin Lakes, while allowing the team to prepare for the sand delivery.

As these examples shows, the EOC learned the value of monitoring the YodelME channels in order to more efficiently dispatch necessary resources. This improved resource productivity and allowed them to better meet key mitigation objectives.

Tracking resources and establishing accountability

The EOC progressed to have an increasingly accurate picture of field operations. This was accomplished through crew check-ins, mapping of crew locations, and more frequent status reporting.

As the flood season progressed, it became clear that contractor accountability was also an issue that YodelME could improve. This was of particular interest to the finance team as they sought to compare ambiguous invoices with actual work completed, often without having an objective record of deployment. The YodelME geo-location tracking record and deployment record was used to identify invoicing discrepancies and issues.
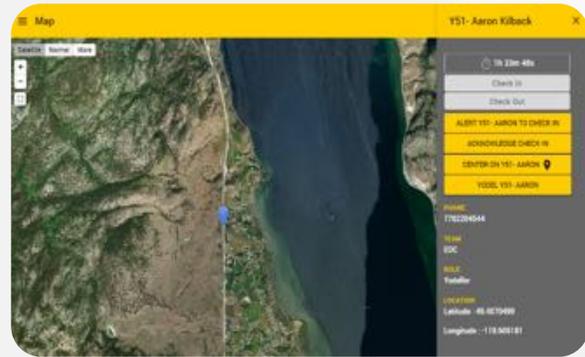
With every yodel, the individual's geo-location is updated and displayed on the YodelME dashboard.

Robust Safety Protocols

During the flood season, personnel were sent to sites that were known to pose safety threats. For example, crews worked close to eroding dikes and shorelines where rising waters had the potential to cause the rapid collapse of land formations. Other crews were sent to sites where water threatened to overwhelm gabion and sandbag barriers.

Some personnel were also sent to remote areas where communication by normal means would have been limited or impossible. For instance, the drone team was tasked with reconnaissance operations up the Tulameen River. This is difficult terrain well outside of cellular range. Likewise, the crews managing response operations for Trout Creek in Faulder were often outside of cellular coverage.

YodelME enabled the EOC to establish a robust and consistent safety check-in system as well as a protocol for emergencies. Satellite terminals were offered to teams going into remote areas to guarantee unbroken contact in the event that emergency communications were necessary. Field personnel were requested to use YodelME to check-in at regular intervals, which automatically provide their geolocation data. YodelME representatives visited these remote sites to make sure that safety check-ins could be performed, and that field personnel were trained on how to use the

The YodelME app allows field personnel to declare an emergency and trigger an instant reaction in the EOC.

YodelME app on their smartphone, including instructions on how to declare an emergency.

Better Decision Making

Field personnel used YodelME to submitted geolocated status reports and resource requests which were automatically archived by the YodelME system and made available for review at the EOC. This provided section chiefs with a "past and present" view as to who was working, where they were located, what issues they are encountering, and what the overall status was throughout the incident response. This significantly enhanced situational awareness and naturally improved decisions making, thereby saving time, resources and money.

Selected YodelME Metrics

825 unique responders used YodelME
6,353 safety check-ins
12,342 yodels relaying resource requests or providing status updates
Mapping data continually updated with each check-in, check-out and yodel

Independent Feedback

Various leaders saw the benefit of the YodelME innovation at the RDOS EOC.

Tim Ewart, who worked in the EOC in an advisory capacity, noted in his report that:

"I was very impressed with this [YodelME] system. The RDOS covers a large geographic area and the flood event affected a good portion of the District. One hundred & sixty (160) people resources (operational period of May 19/18) were scattered throughout the District on various projects and were [effectively] tracked by "Yodel" for safety check ins, communications, and total resources assigned to the event for situation reporting."

Enhanced situational awareness helps ensured that resources such as sandbags were delivered to the right place at the right time.

Crews pump water out of Green Lake. With large-scale resources invested at numerous sites in a 10,400-km2 region, it was critical that the EOC established a reliable communications network and achieved better situational awareness.

Recommendations: Preparing for the Next Emergency

Emergency managers have an opportunity to carry forward the key learnings from the YodelME communications deployment to future emergencies. Any organization responsible for managing emergency response can be better prepared for their next emergency by implementing the following recommendations:

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