

## 9.4 DSS DEPLOYMENT BOOT CAMP – A PROTOTYPE TRAINING ENVIRONMENT FOR IMPROVING COLLABORATIVE EMERGENCY RESPONSE SUPPORT SKILLS

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### 1. Introduction

Over the past three years, National Weather Service (NWS) Central Region has become increasingly active in deploying personnel to high impact events operating under the Incident Command System (ICS) structure to provide on-site decision support services (DSS). In 2011 alone, Central Region supported six separate incidents for which damage costs to the American economy totaled more than a billion dollars each, according to the National Climatic Data Center (2011). DSS specialists were mobilized for four of those incidents (Upper Midwest Floods; Lower Ohio/mid-Mississippi River Floods; Joplin tornado; Missouri River Floods). In three cases (all but Joplin), deployments were made to multiple sites simultaneously, and for extended durations.

To qualify for rapid deployment teams, personnel must first possess proper expertise in a particular relevant discipline (i.e., severe weather, hydrology, marine meteorology, fire weather, etc.). However, technical knowledge is not sufficient; other ancillary skills have proven crucial for maximizing success in these ventures as well. For instance, in order to assimilate into the support structure quickly, a fundamental understanding of ICS terms and organizational framework is essential. An appreciation for the need to coordinate and deliver a unified message across jurisdictional boundaries is indispensable; as is a demonstrated ability to communicate clearly and simply to a diverse, non-scientific audience. Other useful characteristics include adaptability to rapidly changing occurrences and requirements; comfort with the use of mobile technologies, social media, cloud networking for collaboration; familiarity with incident documentation; and understanding how to craft messages for different types of briefings and media.

These are all important requirements which have not been formally addressed in the context of a training plan outside the Fire Weather Incident Meteorologist (IMET) program.

Creating a baseline training structure which focuses on critical skill sets and technological tools needed for these dispatches was the primary motivation behind the prototype DSS Deployment Boot Camp hosted in Kansas City, Missouri in September 2011. A small investment of funding was granted from NWS Central Region Headquarters (CRH) and the Weather Ready Nation (WRN) Roadmap Team to develop an experimental, interactive training experience designed to build capacity for providing quality on-site decision assistance in critical natural disaster situations.

The Roadmap Team supplied sufficient funding to invite a total of twenty NWS forecasters, representing a mix of meteorologists and hydrologists from all four CONUS regions. I also enlisted assistance from several subject matter experts to facilitate sessions, both from within NWS ranks, and from five different partner agencies.

This inaugural workshop combined instructional training sessions with interactive exercises, a series of incident simulations facilitated in part by certified ICS Section Chiefs, sharing of insights from actual event experiences, and a panel discussion which explored perspectives on incident support challenges from representatives of several partner agencies. In the end, participants came to realize some of the most important lessons learned were related to questions about NWS culture change and how we approach strategic operating priorities.

### 2. Relevance to Strategic Priorities

As the NWS pursues its Weather Ready Nation initiative, the key to success will arguably revolve around relational issues at least as much as scientific and technical ones. Some of the most compelling challenges will be associated with enhancing collaborative

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relationships with core partners, and restructuring training to include non-science skill sets such as team-building and risk communication. Organizations that are thriving today are those which have found a way to reduce dependency on centralized command and transitioned toward a model of flattening the structure, empowering employees to connect and collaborate.

That collaborative operating structure has certainly been validated in the context of on-site incident support for NWS Central Region. From the Red River Floods to the Enbridge Oil Spill and the Joplin tornado, services evaluated as the most successful were borne out of cultivating relationships of trust, collaborating to understand mutual needs, and communicating information in clear, insightful ways that directly aided risk reduction decisions.

If first class DSS is vital to the agency's progress, then methodically blending its emergency services model into the architecture of FEMA's National Response Framework (NRF) is essential. The NRF doctrine is guided by five key overarching principles: (1) engaged partnership; (2) tiered response profiles; (3) scalable, flexible, and adaptable operational capabilities; (4) unity of effort through unified command; and (5) readiness to act with a full understanding of risk reduction decision processes in response and recovery operations (FEMA 2008, 2011). These principles are completely consistent with priorities and values governing the NWS mission (Weather Ready Nation 2011). Two conspicuous areas of training deficiency deter seamless integration of NWS DSS into the NRF: (1) Clarity of roles and responsibilities in ICS emergency response situations by all NWS personnel, and (2) understanding and practicing effective risk communication skills. DSS Deployment Boot Camp was designed as a learning environment to help participants explore these very concepts and skill sets.

It is important to note that the call to provide short notice, on-site DSS with excellence is not new to the NWS. Combining local weather expertise with knowledge of customer needs and then interpreting that insight into valuable DSS is a task for which there is a long history in the form of the Fire Weather IMET program. It is the expansion of this need to support a broad range of other disaster events beyond wildfires

which is new. Moreover, it is likely to continue growing. Federal partners such as FEMA, the Environmental Protection Agency (EPA), the Army Corps of Engineers (USACE), and the like, are increasingly aware of the capability and value of the NWS to contribute to emergency support functions. As mission support requests multiply, in concert with increased susceptibility of communities to weather and water calamities, IMET resources will be insufficient to the task.

Completing baseline training in ICS language, structure, principles and roles is simple. The basic introductory courses are available on-line at no cost. NWS Central Region has already established a requirement for all forecasters to complete ICS-100, 200, and 700. Intermediate courses are typically free as well, and not especially difficult to find, but they do require in-residence attendance. Reinforcement of ICS terminology and concepts in the context of NWS operational procedure remains to be fully developed but there are many ways and opportunities to create solutions to that problem. Developing and infusing risk communication skills into standard operating practice is somewhat more challenging, but certainly achievable.

### **3. Risk Communication**

The National Research Council (NRC) defines risk communication as "an interactive process of exchanging information and opinion among individuals, groups, and institutions...including assessments of risk types, hazard levels and methods for managing the impacts." (NRC 1989)

When providing weather support services to decision makers such as incident commanders, it is crucial to understand that risk is not simply a function of the severity of the event, but also of the vulnerability of affected individuals and communities. A thunderstorm with 40-mph winds may not be disconcerting to people in hardened shelters but to first responders, gusts of that magnitude could stir up dangerous flying debris and the lightning itself will pose a safety hazard to outdoor rescue crews. Therefore, effective risk communication is predicated on knowing exactly what the customer needs to know, and being able to communicate relevant information in plain, clear, concise language.

When the process is working well, benefits include improved decision-making, increased

coordination among various levels of government, reduction of conflicting messages, cultivation of valuable working relationships between diverse disciplines, enhanced preparedness and response, a better educated public, and eventually superior solutions to the cost of catastrophes in America.

Prioritizing risk communication skills on par with scientific expertise is a new perspective for many NWS forecasters. Training time for shift workers is already limited. Suggesting a new array of training elements which compete for time devoted to sharpening forecast skills or improving proficiency with forecasting tools is a tough sell. It is a culture change issue and broad-based buy-in will require compelling focused, repetitive vision casting by senior leadership.

#### **4. Culture Change: The “How” is Important**

Even with the support of an executive level guiding coalition, building a training experience intended to foster new skills and transform organizational culture is a substantial challenge. Changing culture is not like changing the drapes. Culture change is about reshaping behavior, tireless commitment to vision, values, and goals; and applauding actions consistent with those goals (DuFour and Eaker 1998; Kotter 1996; Covey 2008). Training systems and daily operating habits must reinforce the development of critical skills, routines and connections until the collective experience of the group forms a new, unique narrative. In short, it takes time.

But research does suggest culture change can be achieved effectively and relatively quickly if you focus on the “whys and hows” more than the “whats” (Seidman 2011).

Author Dov Seidman offers a compelling argument for the importance of adapting our conduct to the realities of a changing world in *“Why How We Do Anything Means Everything”* (2011). There is now an entire “How” movement whose adherents promote the idea that “what” we do is rapidly becoming less important than “how” we do it in the increasingly “flat world” of global interconnectedness. Seidman insists the trend for success will be “toward learning to act with a framework of horizontal connections” and that top-down, command-and-control structures will be endangered. Effective organizations will

train and empower people to innovate and communicate on behalf of the agency within the bounds of known, shared values and a common understanding of vision and mission.

At the writing of this article, it has been a mere 17 years since Netscape Communications released the first version of its “world wide web” browser, effectively inviting the general populace to Internet, and propelling us into the Information Age. Since that time, the free flow of data, information, and imagery has been radically altering how we relate to one another and how our world works.

Like many institutions - and indeed millions of individuals - the NWS has experienced difficulty keeping pace with ensuing technological innovations, particularly with respect to communication media (e.g., mobile apps, social media, blog tools, video production, etc.).

Part of the problem is rooted in the reality that government agencies in general remain enamored with the “what” of their mission (standard array of formatted products, end-to-end control over information delivery, maintenance of established dissemination systems, etc.). Again, the reality of global interdependence and instantaneous access to information of all kinds lends credence to the proposition that the “what” may be less important than the “how” in overcoming this roadblock to progress.

Consider this illustrative example. In 1999, TiVo created the first digital video recorder (DVR). It revolutionized television watching and caused the broadcast industry to rethink its entire business model. Today, TiVo struggles to keep its place in the market because every cable company manufactures and distributes its own DVR. The only way TiVo can stay relevant is to deemphasize the hardware (or the “what”) and accentuate the experience the software delivers (“how” a consumer uses it). Similarly, the secret behind the dominance of the smart phone market by the Apple iPhone does not lie in its integration of the latest technology, but rather in its unwavering commitment to offer an unparalleled user experience. Numerous other examples can be brought to mind with little effort.

Conversely, those who fail to pay attention to the “how” often find themselves struggling, if not

driven out of business completely. This is true in the marketplace (e.g., Circuit City, Borders, Blackberry, Continental Airlines) as well as the public sector (the U.S. Post Office). Thus, to focus primarily on the "what" is can pre-dispose to resistance to change and threaten possible failure through loss of relevance, customer-perceived value or, in the case of commercial ventures, market share. However, emphasizing the "how" can spark motivation, creativity and purpose throughout the workforce.

## 5. The Boot Camp Experience

In designing a training venue such as DSS Boot Camp, the development team unanimously agreed it was important to consider insights such as these - i.e., to get the "how" right - along with applying guidance from experts in effective learning theory.

Research clearly shows people learn best when engaged – actively participating in observing, speaking, writing, listening, thinking, interacting, and doing (e.g., Pike 1994; Marzano 2003; Tewksbury and MacDonald 2005; Buehl 2008).

Studies on multiple intelligences (e.g., Gardner and Hatch 1989; Pink 2005) chart the importance of recognizing different personality types, communication styles, temperaments and strengths. From the viewpoint of instructional design, studies such as these infer value in addressing different styles of learning and teaching to both sides of the brain (i.e., the logical, analytical left hemisphere and the creative, intuitive, linguistic right hemisphere).

In an effort to apply those insights, the Boot Camp leadership team set out to create a learning environment that would help participants explore critical DSS concepts and skill sets with a heavy dose of interaction, discussion and discovery; aiming for participants to encounter a learning experience rather than being subjected to another lecture series in a traditional classroom setting.

Candidate Emergency Response Specialists (ERS) were teamed up with representatives from partner agencies (FEMA, USACE, EPA, and county emergency managers) – all of whom were certified and experienced in various ICS roles. In this sense, the workshop loosely took on the form of a "professional learning community" (Huffman et al. 2001), which served

to promote a shared sense of collective buy-in and accountability for all stakeholders to build a safe, challenging, worthwhile experience.

Class members participated together with facilitators in full-day incident simulations built around three scenarios: an urban tornado, an inland oil spill and main-stem river flooding. Activities included a combination of standard support tasks, as well as several unusual but realistic, surprise situations. Routine tasks included activities such as ICS-style planning briefings with and without visual aids; identifying event specific impact thresholds; conducting filmed media interviews and press conferences; utilizing social media and mobile communication tools; and filing event documentation. Examples of unpredictable injects included testing adaptability in dealing with a sudden power loss; providing conflicting information that challenged consistency of messaging; and requesting opinions concerning subject matters outside the participants' expertise or authority (referred to as "stay in your lane" tests).

Additionally, insights and best practices from the perspective of guest Emergency Response experts were shared in panel discussions. Invited contributors included the Operations Chief, Plans Chief, and Communications Unit Leader from the Joplin Tornado response and recovery operation; USACE members who staffed the Joint Information Center for the 2011 Missouri River Flood; and EPA partners familiar with the 2010 Enbridge oil spill clean-up in Michigan.

Embedding EM partners into the experience was crucial. Post-workshop feedback surveys unanimously gave the highest marks to the active involvement by core partners in facilitating the boot camp scenarios. Their candid, constructive feedback was a strong factor in improving students' understanding of customer needs and in building a common operating picture that spans internal and interagency boundaries.

The partners' viewpoint was perhaps best summed up in this survey comment from a Mobile EOC Team Leader: "This program's goal is very exciting. Growing the number of qualified NWS emergency response specialists will be a huge benefit to those of us who lead disaster recovery teams and manage incident support functions. Working together to train as though

we're on an incident really builds camaraderie and accelerates the learning curve."

The Boot Camp experience also served to reshape mental paradigms which could prove to be useful for navigating NWS culture change challenges. For example, several participants expressed the opinion that operating in an intensely collaborative environment enhanced their confidence in making judgments and offering guidance during simulation exercises. Recent work in effective decision making reinforces this conclusion, suggesting that collaborative teams do tend to make more effective risk reduction decisions than individuals (Schmidt et al 2007; Covey 2008). Connecting, empowering, and communicating ideas freely helps the group adopt the attitude that "none of us is as smart as all of us". This has a propensity to produce a better problem solving climate. Research also suggests a team's capacity to communicate and resolve internal problems and conflicts effectively is directly related to its emotional intelligence – that is, awareness of its own biases and willingness to transcend its own perspective (Gardenschwartz et al 2009). These are not areas which have traditionally drawn attention in scientific training agendas, but integrating them into future plans could be quite beneficial in promoting effective IDSS team performance.

## 6. Next Steps

The WRN Roadmap outlines a strategy for providing enhanced DSS to core partners nationwide. A critical element to implementing this strategy involves the training and eventual certification of Emergency Response Specialists (ERSs). These ERSs represent the backbone of extending DSS for high-impact events, whether on a scheduled basis or on-demand and on-site at emergency incidents.

Recently, NWS executive leadership approved the development of an Operations Proving Ground (OPG), in part to facilitate a key component of the DSS training profile by providing in-residence simulation training, patterned after the DSS Boot Camp, to senior ERSs identified in the Roadmap's Workforce Evolution plan. While all NWS forecasters will receive training related to DSS, and thus attain baseline DSS proficiency, the senior ERSs are the people who will dispatch to high-impact venues to provide on-scene support.

Borrowing from the lessons learned in DSS Boot Camp, OPG Evaluation Sessions will infuse new science and technology with participation by relevant partner agencies, to provide a simulation immersion environment for senior ERSs. These personnel will gain valuable experience such that, when deployed, their seasoned approach will enable effective impact-based DSS.

The OPG will also be engaged to test new forecast tools and other capabilities emerging from NOAA test beds for their readiness to be integrated into forecast office operations. As tools, techniques, or data sets are evaluated, their potential will be measured against "human factors" as well as scientific and technical ones: how a project facilitates good decision making, how it contributes toward effective risk communication and partner collaboration, and how it impacts work flow. In this way, attention will be specifically concentrated on the integration and use of information over and above the amount of information, prior to candidate capabilities being implemented into operations at NWS field offices.

## 7. Conclusion

The vision of a "Weather Ready Nation" translates to improved community emergency preparedness, reduced fatalities from weather disasters, lower mitigation costs, and more rapid post-event recovery. The path to reaching that vision will be mapped out in HOW we train, deliver and advance those services.

In December 2011, a Washington Post article by reporter Ed O'Keefe pointed out the fact that the NWS is "often overlooked in conversations about federal disaster response" despite deserving "credit for providing reliable, accurate weather predictions."

If the NWS is to earn its way into such conversations, and achieve recognition as a key player on the unified emergency response team, we must invest in the skills and capabilities necessary to nurture effective collaborative partnerships; identify situational impacts; classify community risk vulnerabilities; and then design and deliver the world-class, customer-centric, impact-based decision support services needed to inform a Weather Ready America.

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