



USE OF THE US NATIONAL GRID TO ENHANCE SITUATIONAL AWARENESS & DEFINE OPERATIONAL AREAS

EXECUTIVE SUMMARY

In planning for regional, large-scale, or catastrophic incidents, whose impacts likely cover several counties or states, a uniform point & area reference system for defining operational areas will enhance critical situational awareness. To paraphrase from the Army Field Manual, the US Army defines situational awareness as knowledge and understanding of the current situation which promotes timely, relevant and accurate assessment of operations within the impacted areas in order to facilitate decision making. It is an informational perspective and skill that fosters an ability to determine quickly the context and relevance of events that are unfolding. It is easy to see that the importance of a geographic reference system to assist in maintaining situational awareness cannot be overstated when an event stretches across all levels of governmental boundaries, and across responding disciplines with the specific needs of each.

Situational awareness for responders, emergency operations staff, and senior decision & policy makers has always been challenging. A well integrated operational picture is especially difficult in events that result in wide area impacts causing intelligence to come from multiple directions simultaneously. Distilling a steady stream of data into actionable information across various operational areas is essential to affective disaster operations.

Though every large-scale or catastrophic incident after action report dating back to Hurricane Andrew calls for a common reference system; the need for a common and geographic based reference system was made clear again during the exceptionally busy Hurricane Seasons of 2004 & 2005. The State of Florida became intimately familiar with this need during response operations that stretched across all areas of the state over a six (6) week period. Multiple operational areas crossing all levels of government often resulted in confusion as personnel and resources were moved from one side of the state to the other in rapid succession. Additionally, the need became apparent for a geographically based system that could be used by responders to indicate to command staff at various levels when specific missions were underway or completed in a particular area. Traditional municipal or county/parish borders proved unworkable since the impacts of an event do not adhere to governmental boundaries, and as has been demonstrated in every major event since Hurricane Andrew, traditional methods of describing location (street address, landmarks, etc are often destroyed or so dramatically impacted that they're unrecognizable even to local responders.

The United States National Grid (USNG) is the geographic grid reference system identified by the National SAR Committee as the primary catastrophic incident search and rescue geo-referencing system that **must** be used by federal land SAR responders. Additionally, the USNG has been designated as the primary reference grid for interfacing between land and air based SAR operations. Other non-federal responders across local and state jurisdictions have been in the process of adopting the Grid as well. It is important to note that US military assets, one of the largest force multipliers in disaster response operations, uses a grid system which is functionally the same as the USNG, known as the Military Grid Reference System (MGRS). Land based DoD responders are therefore able to share location based information and readily interpret areas of operation defined using the Grid immediately upon joining disaster operations. Additionally, situational awareness can be shared across multiple levels of government not to mention between civilian and military command staff.

PURPOSE

Foster the adoption, implementation and integration of a geographic-based point and area reference system that can be used to help both responders and decision makers provide order to the chaos of disaster operations. Such a system must be easily learned as well as uniform across disciplines and governmental entities. The system should enable decision makers to define required resources and quickly establish areas of operation for deployment of personnel necessary to conduct various missions such as search and rescue, emergency medical services, law enforcement, and mass care. A common reference system that is both a point and area reference grid will be essential to providing situational awareness on the status of missions back to command staff.

Use of a common location language, which has long been the foundation of US military operations, drives an integrated common operational picture essential to changing outcomes for disaster survivors. In addition, integration of a referencing system such as the USNG across jurisdiction and discipline supports multi-agency disaster operations who often rely on EMAC or other force multipliers by providing a common language to define and assign areas of operation.

METHODOLOGY

Specific and scalable operational areas are identified using the United States National Grid areas are classified into three basic categories –strategic, regional & tactical. Strategic level operational areas are defined by 100,000 meter grid squares (62 miles) and provide a view more typically used by operatives at the state emergency operations center. Regional operational areas are generally designated by 10,000 meter grid squares (6.2 miles) suitable for assignment to taskforces or similar forward command elements. Tactical areas of operation are typically designated by one or more 1,000 meter grid squares (.62 or approximately 1/2 mile) and provide detailed information for direct tactical operations.

Designation of operational areas using the scalable USNG allows for consideration of strength or availability of resources and degree of impact. In essence, one or more grid squares of any strategic, regional or tactical size can be identified together if designation of a larger operational area is desired.

This is indicative of the flexibility and scalable nature of the Grid, which makes it well suited to meet the needs of responders, field commanders and strategic level decision makers based on the complexity or severity of the disaster consequences.

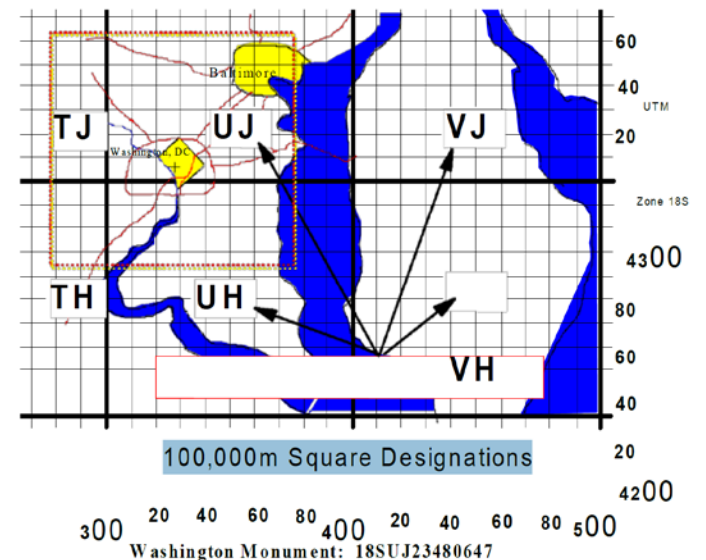


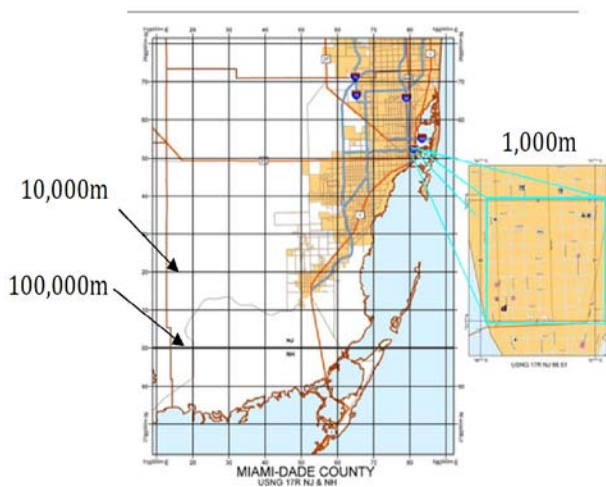
Figure 1: Strategic Operational Areas (62 miles) divided into 100 regional areas of operation (6.2 miles). Remember – based on severity of impact or resource availability multiple areas of operation can be combined and assigned appropriate resources

STRATEGIC AREAS OF OPERATION

The designation of one or more 100,000 meter grid squares should be used by command staff or decision makers such as a State Coordinating Officer (SCO) to designate strategic operational areas for the purposes of assessing damages, determining required resources, deploying assets, and monitoring disaster operations. These strategic level areas of operation also allow for solid situational awareness vertically across levels of government, such as the state/federal interface.

REGIONAL AREAS OF OPERATION

The SCO or other appropriate command staff should further break the impacted area down into manageable sectors by designating one or more 10,000 meter grid squares as regional areas of operation. Each regional operational area should be referred to by using the SW corner coordinate of the target operational area. Specific commanders should be assigned responsibility for operations within this area.



TACTICAL AREAS OF OPERATION

Area commanders or other appropriate forward command elements can then divide assigned regional areas of operation into 1,000 meter grid square(s) tactical operational areas and assign tactical response resources (US&R, LE, EMS, etc) responsibility for completing missions within assigned areas. As with both strategic and regional operational areas, tactical operational areas will be referred to by the SW corner coordinate of the target area.

As noted previously, because the USNG is a uniform national system, resources that are arriving via EMAC request or federal agencies who are unfamiliar with the area can very quickly understand where their area of responsibility is located.

RECOMMENDATIONS

Adoption of the USNG should be completed at all levels of government across all disciplines that have responsibility for disaster operations or may be utilized as force multipliers. Protocols for integrating the use of the USNG for situational awareness and designation of operational areas should be drafted and integrated into standard operating proceeds or other appropriate emergency operations plans. Training & Exercise materials should be developed and opportunities provided to responders across all jurisdictions. Training materials should include resources for command staff, decision and policy makers as well as response staff that support field operations.

Implementation and operational integration of the USNG will allow policy makers and command staff to ensure well defined operational areas, determination of required resources, appropriate distribution of resources, and ability to monitor disaster operations. Well crafted standard operating procedures incorporating the common location language of the USNG across jurisdiction and discipline promotes strong situational awareness necessary to support multi-agency activities.

CONCLUSIONS

History and experience have demonstrated a critical need for implementing a common geographic- based reference system that can support disaster operations. The USNG is a scalable point & area reference system, which can be effectively, used to divide an impacted area (the battlefield) into progressively smaller sectors to facilitate situational awareness and provide a method of quickly assigning areas of operation. The USNG is available, accepted and is easily learned to ensure rapid integration into existing governmental and NGO response agencies, including the US military which currently uses a similar and wholly compatible system.

RESOURCES

The United States National Grid, Federal Geographic Data Committee website <http://www.fgdc.gov/usng/>.