

## Information Superiority for the Lower End of the Spectrum

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### Abstract

Humanitarian Assistance and Disaster Relief (HA/DR) operations are the most frequent of current operations. At last year's Command and Control Research Symposium the author presented a paper outlining a six-step program for translating JV2010 capabilities into new concepts for military support to HA/DR operations. This paper covers the completed activities: an HA/DR test involving the USCINCPAC's Political Military Anchor Desk (PMAD), the Workshop on HA/DR in the Next Century and the Virtual Information Center (VIC) experiment in conjunction with the Center of Excellence in Disaster Management and Humanitarian Assistance (COE).

### 1. Background

Humanitarian Assistance and Disaster Relief (HA/DR) operations are the most frequent "named" operations of the US military in the post Cold-War environment. An example from USPACOM is the recent Operation Paka in support of recovery on Guam after Typhoon Paka. HA/DR operations provide a concrete means of extending our CINC's engagement policy to nations in the Pacific area.

At last year's symposium an introductory paper was given by one of the authors which appears as the lead article in the proceedings of the 3rd International Symposium [Sovereign, 1997]. The article defined HA/DR operations and reported on the formation of the research program to be updated in this paper. It outlined a six-step program for translating JV2010 capabilities into new concepts for military support to HA/DR

operations. These six steps in the long-term program were the following:

1. Define the military capability packages required for HA/DR given the JV2010 thrusts.
2. Determine the requirements for HA/DR that are not appropriately met by existing US military capabilities.
3. Review experience in similar operations and identify needs of USPACOM-developed scenarios via on-going experiments, advanced system demonstrations and Joint Warrior Interoperability Demonstrations (JWIDs).
4. Examine commercial remote sensing, communications and computer services that are available or will become available in the next few years.
5. Synthesize (via professional judgement, analysis workshops and performance evaluation) a set of possible solutions to the HA/DR C4ISR requirements using the above systems while relieving the burden on US military systems.
6. Assess and test the alternative solutions for cost-effectiveness through costing and distributed analysis, modeling, simulation and exercises.

The purpose of this paper is to report on the progress of the research effort in the last year. It is organized into an introductory section on HA/DR operations and sections on the major events in the program, an initial test called PAC CHEST, the Workshop on HA/DR in the Next Century and the Virtual Information Center (VIC) Experiment.

The participants in the program include the:

Command and Control Research Program (CCRP),

Headquarters of the US Pacific Command (HQUSCINCPAC),

US Naval Postgraduate School (NPS)

Center of Excellence in Disaster Management and Humanitarian Assistance (COE),

Joint C4ISR Battle Center (JBC),

Joint Staff Directorate of Force Structure, Resources and Assessments (J-8),

Program Analysis & Evaluation Directorate Office of the SECDEF (OSD (PA&E))

as well as many individuals and companies from throughout the C2, analytical and HA/DR communities.

Our thanks to their support which has made the program possible.

## 2. HA/DR Operations

In keeping with the new National Military Strategy, HA/DR operations are a concrete way for the CINCs to "shape and respond" with other nations within the goal of engagement. They involve close coordination with other US government agencies, (FEMA, Dept of State, AID) which often reimburse DoD for the costs of military support to HA/DR. They also involve international organizations, and non-governmental organizations (IONGOs) such as the UN and the Red Cross. These organizations have extensive resources and perform most of the final distribution of goods and services to the affected populations. This is particularly true in the long term as responsibilities are transitioned from the US military, who are often present early-on because of forward presence and unique transportation capabilities.

One of the primary lessons of the research has been the realization that the military is only a small, nevertheless vital, player in HA/DR operations and can not call the shots. C3 in HA/DR stands for Collaboration, Cooperation and Coordination! The focus of information operations in HA/DR must be on information sharing so that unity of effort can be possible.

Many of the IONGOs have been on-scene with long-term development projects and have unique insights into the situation and the needs of the affected population as well as assets that can be quickly diverted to the emergency.

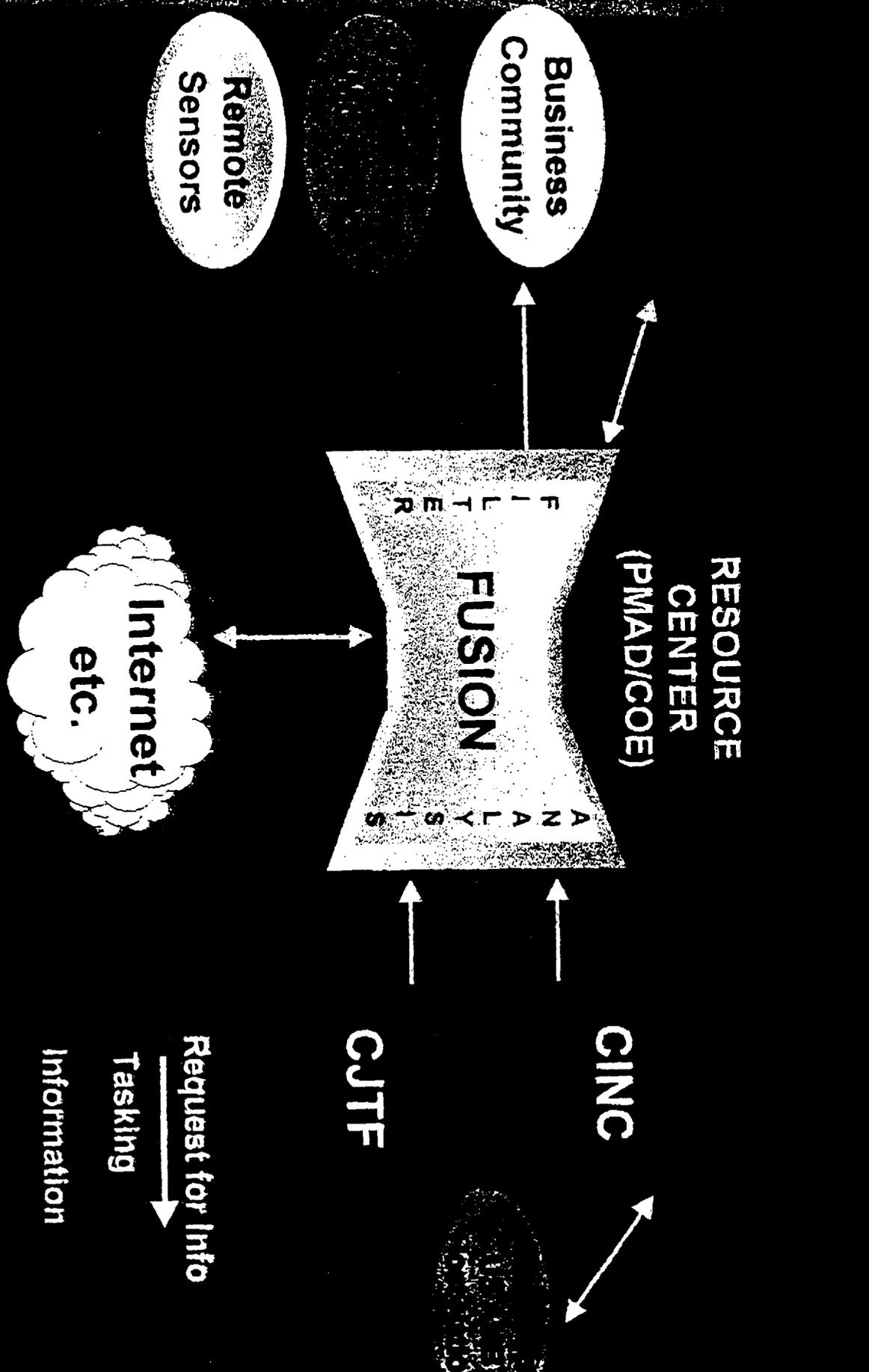
The US military typically provides security, transportation, logistics and medical support for HA/DR operations but the mix varies greatly according to the circumstances. Major HA/DR operations often involve creation of a Joint Task Force (JTF). The military units concerned are often reserve units, special operations forces and other very specialized units, many of which may not have worked together in the recent past. Moreover they may not have experience in the host nation or in working with the IONGOs or even with the variety of US agencies involved.

As can be imagined from the introduction above, the command and control of HA/DR operations is complex. Interoperability is often a problem. Planning is complicated by differing views of security versus transparency and openness among the participants. The National Military Strategy states: [Shalikashvili, 1997 p22]

"It is imperative that our Joint forces also enhance their ability to operate in consonance with other US government agencies and with the international and non-governmental organizations in a variety of settings"

New concepts for employment of the US military's current and advanced capabilities are being developed for supporting HA/DR operations. Some of these draw upon the capabilities that Joint Vision 2010 will be bringing to the US military. Information superiority is useful against nature as well as intelligent adversaries. Precision Engagement is important in disaster situations in order to save lives in the critical first 24 hours. Dominant Maneuver allows rescue forces to be on the scene quickly. In particular, Focused Logistics may make it possible to deploy the right aid to the suffering in time without disrupting the already damaged local infrastructure. Use of these

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JV2010 capabilities, which are bought for warfighting missions, makes sense in everyday HA/DR operations because they will afford real-world training opportunities and will test the capabilities in a wide variety of conditions.

Some other new concepts come from the commercial innovations in communications and remote sensing. These offer for example both survivable satellite communications and near-real time imagery. Altogether these new technological potentials offer the ability to greatly enhance the performance of the military in HA/DR operations and also to avoid tying down military forces and assets in long-term commitments which reduce our readiness for higher priority missions. Information sharing is the key to accomplishing the smooth transition to civilian control. Sharing requires dealing largely with releasable information.

### 3. PAC CHEST: The PMAD and COE Complex Humanitarian Emergency Support Test

PAC CHEST demonstrated the power of open-source information in planning an HA/DR operation in late September of 1997. It was a cooperative effort of USCINCPAC's prototype Political Military Anchor Desk (PMAD) and the USPACOM's Center of Excellence in Disaster Management and Humanitarian Assistance (COE). PAC CHEST tested their combined ability to support the information requirements of a real-world HA/DR operation, the Indonesian forest fires. PMAD is a prototype electronic library of staff with access to diverse information databases that can provide the context and baseline conditions for HA/DR operations in any part of USPACOM's world. PMAD functions include retrieval, digestion, display, validation, protection and dissemination of information.

The operational objective of PAC CHEST was to support political-military-economic information needs of HQUSCINCPAC personnel in crisis

using an anchor desk prototype. It provided customer-defined retrieval and research services plus discreet information push from multi-source data/information and analytical systems. A hierarchy of essential elements of information was developed and made available for semi-structured requests for information. Information was selected, evaluated and delivered to the requester, who assessed its value.

The participants in the PAC CHEST included USCINCPAC and COE staff plus subject matter experts including a retired ambassador, a retired general and an expert in humanitarian field operations. Internet searches were performed by reservists associated with USPACOM.

Outcomes of PAC CHEST included: [Kane, 1997]

1. PMAD provides good information faster than otherwise available
2. PMAD's utility is highest for long-range, big picture
3. Interfaces between questioner, analyst & researcher are critical
4. Important contextual background can be collected beforehand reducing start-up time
5. Although contributing significantly to the situational awareness at the strategic /operational level, additional detail would be required for the operational/tactical level.
- 6 Successful searches could be accomplished with about an hour of active search time

PAC CHEST was a significant step in demonstrating the utility of Internet information to assessing the situation at the initiation of HA/DR operations. This information can be shared with all the other organizations that are involved in the decision-making.

### 4. Workshop: HA/DR in the Next Century

Almost 100 experts met in the Washington DC area on October 26- 28, 1997 to identify

information superiority concepts that would utilize JV2010 capabilities for the lower end of the operational spectrum. The workshop was the convergence of several efforts including the PMAD and PAC CHEST as described above, NDU's OOTW Command and Control concepts, the USPACOM / NPS series of meetings on methods for analysis of OOTW operations and the JBC's charter to identify near-term improvements to command and control of JTF operations.

The purpose of the conference was to generate concepts for exploitation of new technologies for HA/DR operations that could be tested in an experiment in conjunction with JBC in the near term. With regards to the systems involved, the emphasis was on commercially available technologies for interoperability and affordability. Working groups met intensively to develop testable new concepts within the three-part framework defined below:

#### Collaboration, Cooperation & Coordination in HA/DR Operations

- Organization & procedures,
- C4ISR architectures

#### Information Acquisition

- Sensing & fusion,
- Data transformation to information

#### Crisis Management

- Modeling,
- Real-time resource coordination

The six working groups presented their results and a synthesis effort defined a Virtual Information Concept (VIC) that integrated their findings. The results of the workshop are given in [Sovereign,1998].

#### 5. Virtual Information Center (VIC) Experiment

The workshop led to formulation of the Virtual Information Center concept that must be tested and refined. VIC is envisioned as a service package that encourages sharing of information

among all the participants in the HA/DR operation. The VIC would provide background and current information relevant to a HA/DR operation, primarily through reach-back to the home organizations of the participants and the Internet. It would serve all participants in the operation through a plug-in module that would be supplied as a service package by one of the supporting participants who would manage the network. It would interactively draw upon all sources of information and disseminate it to members of private virtual networks in a controlled, but unclassified manner.

The VIC concept draws extensively upon interoperable web-based information sources for obtaining data and displaying fused information. It depends upon the Internet for communications within its elements and to outside sources. The world-wide availability of data communications particularly the new Low Earth Orbit satellite mobile services promise a virtual system architecture that will be largely immune to terrestrial natural disasters. World-wide commercially available services for both sensing and communications are becoming available. The VIC represents a step towards a concept of operation for their use.

The VIC concept includes a fusion element within the military so that classified information could be included. This is necessary in order to provide a fused Common Operational Picture (COP) to the military participants. VIC also must eventually include a bulletin board or Domino server or some even more capable fusion element outside of the military that will provide information services for the other participants in the operation. This role might be performed by the PDMIN at COE, for example or it might be included in the field, as was provided to the UN by the Swedes in Rwanda.

A VIC HA/DR experiment with COE, JBC and others in April was the initial step in testing this concept. The sources of information include the

Internet and classified sources as in PAC CHEST but with more interactive searching for more detailed and current information. This second experiment extended the network-centric capabilities of PMAD that were demonstrated in PACCHEST to additional non-traditional information sources for the CINC and CJTF that could be shared with the other participants early in a potential HA/DR operation. The scenario was a simulated complex disaster in the Philippines based on a typhoon.

The VIC experiment was distributed with networked participation at several locations in Hawaii and four locations on the East Coast. Connectivity included classified and unclassified e-mail, fax and telephone, and the PC-based Netmeeting VTC which allows video and white-board sharing. A predictive modeling cell provided a static scenario generator and look ahead capability for planning via the Consequences Assessment Tool Set (CATS).

The VIC experiment drew upon the COE and surrogates for the diplomatic community, the international business community, commercial and unclassified remote imagery, interagency and international and non-governmental organizations including the Red Cross for this additional information. It was a first step in seeking to open an interactive dialogue with these sources.

Although the quantitative data from the VIC experiment has not yet been evaluated, from the daily and final hot wash sessions a number of observations can be draw at this time.

The VIC experiment has demonstrated the potential of the VIC concept. The CINC role player said in the recorded final VTC, that "VIC allows an opportunity to be cognizant of issues you otherwise wouldn't be aware of". The CJTF role player stated that "VIC is essential in a crisis". Moreover the PACOM CINC, Adm. Prueher indicated agreement and has already asked his staff to put in place some of the VIC

processes as a result of his two visits to the experiment. Although it is not possible to present as strong results as in PAC CHEST where a real emergency was involved so that comparison to the state of knowledge of the CAT could be made, the subjective judgments support the VIC concept. On the other hand a great deal of refinement remains to be done.

The lessons learned in the VIC experiment include items regarding obtaining, processing and disseminating information. Each are discussed below.

A. Non-traditional sources of information have the potential to provide on-the-scene information that would be useful and releasable to others but obtaining the information may be difficult. It is noted that in a real emergency some but not all of the difficulties might be resolved more readily than in VIC.

1. The international business community is hesitant to provide information to the US military (and possibly to the US government) without explicit authorization and encouragement from above. A formal Department of State or International Organization appeal for information and support may be necessary and agreements allowing release of local information by personnel in the field must be pre-negotiated.

2. Extensive inter-agency coordination is required to obtain support. It is necessary to push information up the chain to the inter-agency process in order to avoid appearing to be too far out in front and to support their decision-making processes.

3. Remote sensing is technically available but procedures must be worked out for timely reception of imagery as needed.

4. Contacts with the IO/NGO community must be further developed in order to establish a two-way dialogue and exchange of information.

5. Predictive modeling is a useful tool for encouraging early information sharing and analysis. A dynamic scenario driver is needed and

more tools such as the Preventive Medicine Planning Tool are needed.

B. Processing of information in PMAD has improved greatly compared to PAC CHEST. Making available the RFI and responses throughout the VIC via the website is very useful. Adm. Prueher commented very positively on the conciseness of the responses. The color coding of completed RFI is quite useful. The concept could be extended to provide partially completed responses. A display of which sources have been tasked for each RFI would be helpful. It may be worthwhile to have each participant indicate their ability to contribute to the RFI to reduce the issuing of separate "Additional Info" pages to the RFI website. Achieving a higher level of analysis is still desired. Very few "Push" information messages were distributed in this experiment.

C. A major difficulty is the need for a Common Operational Picture for HA/DR operations. That can be provided to all participants. Net meeting provides a communication tool but for point-to-point discussions only in the mode used in VIC. A broadcast approach of regular updates is needed at least until a continuous picture is developed and automatically distributed. It may be necessary to edit the COP for distribution to non-government participants.

Planning is beginning for the next steps in VIC. A strategy is to work intensively on the military side and separately on the interagency and international side to derive systems for sharing

within the two domains while maintaining the interoperability of the two systems. This will allow the command to make progress while the longer-term developments outside are worked. As a part of this strategy, an "objective" level concept for information sharing within USPACOM may be developed.

Meanwhile an extension of the VIC experiment can be planned with the JBC and other participants. It is being proposed that the JBC and USCINCPAC meet during this Command and Control Research and Technology Symposium since most of the key players will be present. Another experiment will be planned for early next fiscal year. Please contact one of the authors if you have something to contribute to this experiment.

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