



**CONR - 1 AF (AFNORTH)**



# **Incident Awareness and Assessment (IAA)**



**June 2010**



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# Foreword



## NATIONAL GUARD BUREAU AND AIR FORCES NORTHERN



### MEMORANDUM FOR RECORD

From: Director of Intelligence (J-2), National Guard Bureau (NGB) and Commander, Air Forces Northern (AFNORTH)

Subject: National Guard / AFNORTH Incident Awareness and Assessment (IAA) Unity of Effort

Defense Support of Civil Authorities (DSCA) is one of the most important responsibilities of the US military. A key enabler of DSCA is the Incident Awareness and Assessment (IAA) mission which leverages traditional DoD and other governmental Intelligence, Surveillance and Reconnaissance (ISR) capabilities in support of domestic operations while assuring strict adherence to all applicable legal frameworks.

Successful IAA relies heavily upon a unity of effort between all IAA stakeholders and mission partners. The National Guard and AFNORTH's 601<sup>st</sup> Air Operations Center provide DoD's first response to any given DSCA contingency requiring close coordination between both organizations. To streamline national processes and procedures, AFNORTH and NGB-J2 have partnered in an effort to improve the quality, timeliness, and relevance of the IAA information provided to civil authorities.

In an effort to capture the lessons learned from recent DSCA operations and identify best practices for IAA, AFNORTH and NGB J2 have collaborated by developing a complementary set of IAA guidelines. While each is tailored to a specific customer, together the National Guard Joint Force Headquarters-State J2 IAA Handbook and the AFNORTH IAA Playbook provide IAA stakeholders with a broad range of consistent guidance for IAA planning and execution.

Both documents are posted on each organization's home page at the links below:

National Guard Bureau J2 website: [https://gkoportal.ngb.army.mil/sites/J2\\_CI/IAA/default.aspx](https://gkoportal.ngb.army.mil/sites/J2_CI/IAA/default.aspx)

AFNORTH A2: <https://operations.noradnorthcom.mil/sites/afnorth/Directorates/A2/default.aspx>

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# Section 1 General Overview



## Authorities

Natural or man-made disasters and special events can temporarily overwhelm local, tribal, state and non-military federal responders. The Department of Defense (DOD) has a long history of supporting civil authorities in the wake of catastrophic events. When directed by the President (POTUS) or the Secretary of Defense (SecDef), United States Northern Command (USNORTHCOM) and service components will respond quickly and effectively to the requests of civil authorities to save lives, prevent human suffering, and mitigate great property damage. The Joint Strategic Capabilities Plan 2006 (JSCP) directed the commander of USNORTHCOM to prepare a plan to support the employment of Title 10 DOD forces providing Defense Support of Civil in accordance with (IAW) the National Response Framework (NRF), applicable federal law, DOD Directives (DODD), and other policy guidance including those hazards defined by the 15 National Planning Scenarios that are not addressed by other JSCP tasked plans. DSCA is a subset of DOD civil support that is performed within the parameters of the NRF. CDR1AF (AFNORTH) CONPLAN 3501-08 supports CDRUSNORTHCOM CONPLAN 3501-08.

## Incident Awareness and Assessments (IAA) Defined

IAA is similar to DOD's definition of Intelligence Surveillance and Reconnaissance (ISR). However, ISR is conducted outside the United States over foreign territory or within the United States during Homeland Defense events, while IAA is conducted within the United States in support of DSCA operations. The change in title is necessary to make it clear that DOD does not collect Intelligence on US persons. IAA operations focus on providing timely and usable information to all levels of command and to local, State, Civil, and Federal leaders in order to save lives, reduce human suffering and protect property. The three mission sets of IAA are Broad Area Coverage (BAC), Damage Assessment (DA), and Situational Awareness (SA). Similar to ISR in the HD mission, IAA capabilities include Electro-Optical (EO), Infra-red (IR), Synthetic Aperture Radar (SAR), Multi-spectral/Hyper-spectral (MSI/HSI), and Full Motion Video (FMV).



## **AFNORTH's tasks in support of IAA include:**

- ❑ Assist USNORTHCOM in identifying, sourcing, sustaining and employing airborne IAA assets. Additionally, if the DSCA situation will require dynamic movement and tactical control of airborne assets, AFNORTH will also assist USNORTHCOM in identifying the need for a Dynamic Ground Control capability (like a Joint Terminal Attack Controller (JTAC)).
- ❑ AFNORTH will execute Collection Operations Management (COM) for assigned airborne IAA through the AFNORTH /AOC (601st IRD) .
- ❑ AFNORTH (601st IRD) will coordinate and integrate DOD IAA collection efforts with non-DOD federal, state government, local government, and non-government airborne collection assets to increase efficiencies. This effort is greatly facilitated when all parties elect to participate in the Contingency Response Air Support Schedule (CRASS) process.

## **Roles and Responsibilities**

**U.S. Northern Command (USNORTHCOM).** USNORTHCOM plans, organizes and executes homeland defense and civil support missions, but has few permanently assigned forces. The command is assigned forces whenever necessary to execute missions, as ordered by the President and Secretary of Defense. USNORTHCOM's civil support mission includes domestic disaster relief operations that occur during natural or man-made disasters (e.g. fires, hurricanes, floods and earthquakes). Support also includes counter-drug operations and managing the consequences of a terrorist event employing a weapon of mass destruction. The command provides assistance to a Primary Agency when tasked by DOD. Per the Posse Comitatus Act, Title 10 military forces can provide civil support, but cannot become directly involved in law enforcement.

In providing civil support, USNORTHCOM generally operates through established Joint Task Forces subordinate to the command. An emergency must exceed the capabilities of local, state and federal agencies before USNORTHCOM becomes involved. In most cases, support will be limited, localized and specific. When the scope of the disaster is reduced to the point that the PA can again assume full control and management without military assistance, USNORTHCOM will execute its exit strategy and redeploy DOD forces.

**National Guard Bureau (NGB).** The NGB coordinates with National Guard forces and assets through the States' Adjutants General to monitor/coordinate civil support operations to assist local, State, and tribal authorities. NGB assists USNORTHCOM and its components in synchronizing/integrating federal and non-federal military operations to avoid duplication and achieve unity of effort. NGB will provide insight into non-federalized military air domain operations to AFNORTH. AFNORTH planners (functional Subject Matter Experts (SMEs)) should coordinate with their National Guard Bureau counterparts in pre-planning activities and throughout all phases of the operation. NGB J2 is the lead organization for coordinating Title 32 ISR assets and support and will act as the focal point for interaction between the IRD and State intelligence staffs. Title 32 State resources (people and aircraft) will be the NGB's responsibility to track for SA purposes. NGB will disseminate this information.

**Title 32 Operations.** AFNORTH Title 32 personnel may be involved in Title 32 IAA operations in support of individual State authorities. Affected states can request (through the EMAC process) that AFNORTH (601st IRD) assist in COM for IAA operations. Under this request, IRD personnel would coordinate the State's collection assets to fulfill state collection requirements. This is the preferred Title 32 operational structure, as it provides full visibility to on-going IAA operations to DOD and Federal partners thus streamlining response efforts across the supporting community. Additionally, this allows for the identification of IAA shortages and areas of interest, and the leveraging of previously untapped assets and capabilities. IAA collection guidance resides with the directing State, however AFNORTH (601st IRD) will use established channels and reporting guidelines to accomplish IAA mission taskings.

When not designated as the COM, command and control of IAA assets is exercised by State authorities (typically from the State Joint Force Headquarters-JFHQ). IRD personnel, in Title 32 status, are still available to assist affected states by providing subject matter expertise, LNO augmentation, and various pre-planned dissemination sources.

**Department of Homeland Security (DHS) – Interagency Remote Sensing Coordination Center (IRSCC).** The IRSCC advises the Secretary of Homeland Defense, Under-Secretary for Federal Emergency Management, the Director, National Response Coordination Centre (NRCC), and Chief of Intelligence on remote sensing issues. The IRSCC was created to improve interagency remote sensing support. The IRSCC supports field, regional, and national decision-makers and synchronizes all national remote sensing resources and capabilities. The IRSCC serves as the final clearinghouse for all remote sensing requirements generated at the field, regional, and national levels and validated at the NRCC. The Director, NRCC will act as the final arbiter in determinations of requirement priorities and the Co-Chairs will act as the final arbiter in determinations of remote sensing resource allocation requirements in support of validated, prioritized remote sensing requirements.

Central management of remote sensing requirements at the IRSCC serves two primary functions. First, it eliminates potential duplication of effort. Secondly, it ensures that anticipated/generated remote sensing products and information are made available to the maximum number of potential Federal, State, and local users.

## Mission Sets

**Broad-Area Coverage (BAC).** BAC refers to the collection effort aimed at collecting imagery of a large swath of territory, with the view of determining the full extent of destruction following a disaster (man-made or natural) or, if executed in advance of an incident, the pre-disaster state of an area. The following graphic depicts the scale.



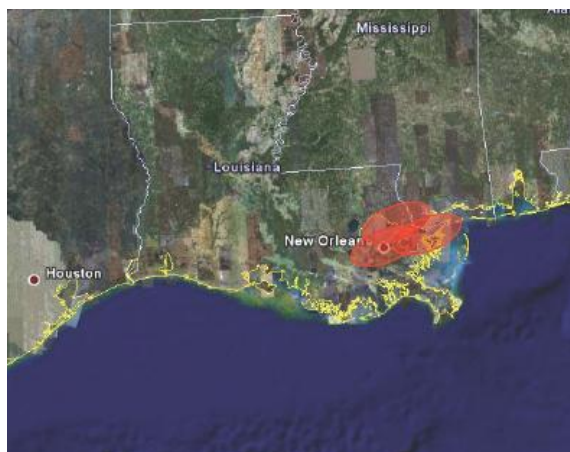
**Broad Area Coverage Scale**

**Damage Assessment (DA).** DA refers to the collection effort aimed at determining the full extent of localized destruction following a disaster (man-made or natural). Individual targets can include specific infrastructure, small areas, communities, etc. The following graphic depicts the scale.



**Damage Assessment Scale**

**Situational Awareness (SA).** SA refers to the collection effort aimed at establishing and maintaining a detailed and complete understanding of an evolving situation on the part of key decision-makers and local responders. It represents the most time-sensitive of the three collection efforts and is therefore most often associated with Dynamic Retasking. The following graphics depicts the scale.



**Situational Awareness Scale**



**Imagery Types.** The following table from the DHS ISR Playbook provides an overview of remote sensing techniques available for crisis response. It provides a short description of the discipline, information on the type of targets for each discipline and advantages and limitations.

Discipline	Description	Types of Targets	Advantages and Limitations
<b>Electro-Optical (EO)</b>	Visible images are similar to pictures a photographer might record in that they rely and display reflected light. If light is available, features like mountains, rivers, lakes, silt run-off from rivers into the sea, and coastlines are clearly visible. Clouds appear white because they reflect light.	Unlimited, light permitting	Limitation: Visible imagery depends on available light, it can only be detected during the day. Advantage: Literal view; easily interpreted
<b>Infrared</b>	Infrared images display temperature differences. Infrared sensors pick-up data both day and night. They show the pattern of heat (infrared radiation) released from the Earth. Heat-producing areas, such as warm water currents or cities (with heat-absorbing concrete and asphalt and heat-producing cars, people, and factories) are bright spots on infrared images. Clouds appear in varying shades of gray, depending on their temperature, which is determined by their height above Earth.	Surface temperatures, vegetation and soil distribution and their changes to estimate biological productivity, understand land atmosphere interactions, and detect ecosystem change, monitoring of eruptions and precursor events, gas emissions, eruption plumes, development of lava lakes, eruptive history and eruptive potential, extent and effects of wildfires, flooding, coastal erosion, earthquake damage, and tsunami damage, mapping of surface soils, monitoring desertification, deforestation, urbanization.	Advantage: Ability to operate at night Limitations: Adversely affected by atmospheric conditions, such as thermal crossover, and atmospheric attenuation..

Discipline	Description	Types of Targets	Advantages and Limitations
<b>Multi-Spectral Intelligence (MSI)</b>	In Multi-spectral Imaging (MSI), images of a scene or object illuminated by the sun or other sources are created using reflected or emitted energy from different parts of the spectrum. If the proper wavelengths are selected for collection and exploitation, multi-spectral images can be used to detect targets	Potential spectral uses include oil spill boundaries, specific materials and components of aerosols, gas plumes, and other effluents, Bathymetry and Hydrology products, identification and mapping wildfire threats, including hazardous fuel accumulations, determine vegetation classes, soil types, and hydrology.	Advantage: signatures are unique for each material, allows for discrimination of one material to another based on spectral signatures of the materials. Limitation: Weather Dependent
<b>Hyper-Spectral Intelligence (HSI)</b>	HSI collects hundreds of very narrow wavelength bands with much finer spectral resolution to “see” reflected energy from objects on the ground. Hyper-spectral sensors measure hundreds of wavelengths; it is not the number of measured wavelengths that defines a sensor as hyper-spectral. Rather it is the narrowness and contiguous nature of the measurements. The resulting hyper-spectral data offers a more detailed view of the spectral properties of a scene than the more conventional broad (spectral) band data, which is collected in wide, and sometimes non-contiguous bands.	Targets include MSI targets but have finer resolution capabilities	Advantage: spectral signatures are unique for each material; it should be possible to discriminate one material from another based on differences in spectral signatures of the materials. A primary goal of spectral collections is to discriminate, classify, identify and quantify materials present in the image. Limitation: Weather Dependent

Discipline	Description	Types of Targets	Advantages and Limitations
<b>Synthetic Aperture Radar (SAR)</b>	<p>Microwaves used in SAR are longer than those of visible light, and are less responsive to the boundaries between air and the water droplets within the atmosphere. SAR systems can collect data through clouds and light rain.</p> <p>Describing a scene in terms of range and azimuth creates SAR images. This gives the collected imagery the look of a “plan view” drawing, and provides very specific information about exactly where every object is positioned in relation to every other object on the ground.</p>	<p>Bathymetry in shallow seas and Coastal zones; Hazard and disaster detection (flooding, oil spills) detection of landslides; detection of surface movement caused by earthquakes, soil moisture, vessel detection, mapping flooded regions, volcanic deformation and subsidence.</p> <p>Hurricane support - information on the structure distribution of rain cells/rain bands, direct measure of the storm’s wind field at the ocean’s Surface.</p>	<p>Advantage: All weather, day or night</p> <p>Limitation: non-literal imagery; more difficult to understand/utilize; objects that do not reflect RF energy, do not show up.</p>

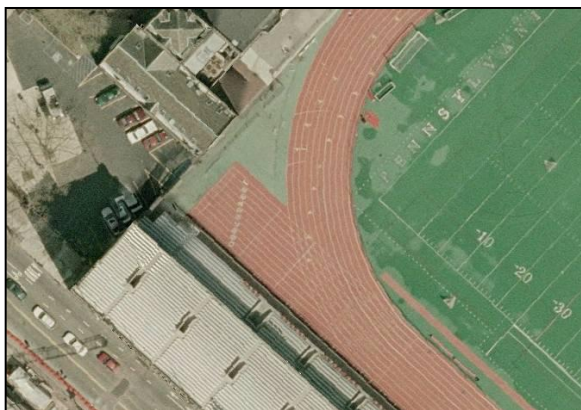


## Section 2 Electro-Optical (EO)



**Application.** EO systems utilize light sensitive receptors to collect and display images or video. When referring to ISR/IAA sensors, EO typically means images produced in the visible light spectrum. EO imagery is available in various degrees of resolution. It is important that customers indicate the resolution required to answer their specific needs.

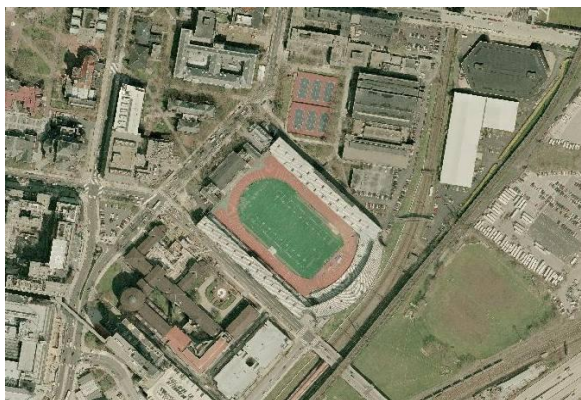
### Examples



Six-inch resolution



Two foot resolution



One meter resolution



Ten meter resolution



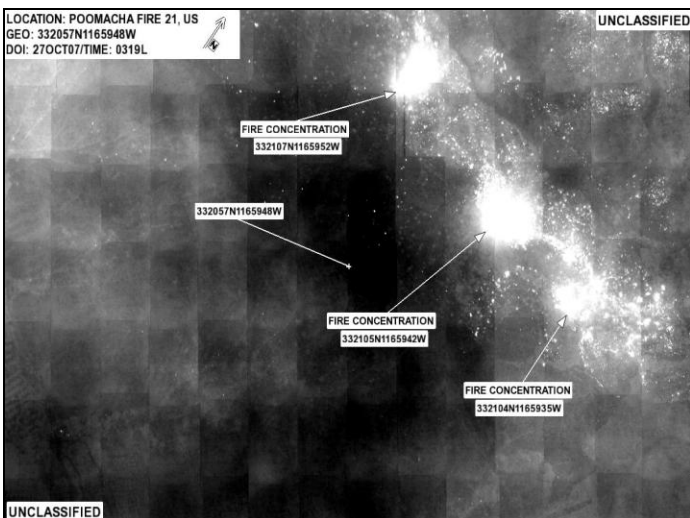
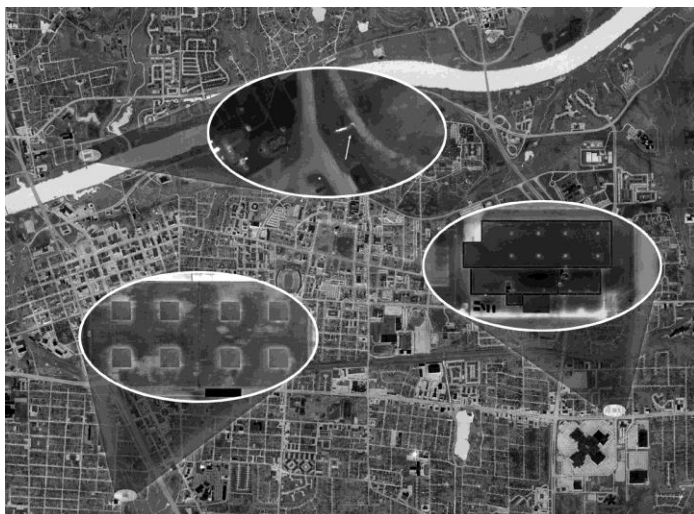


# Section 3 Infra-red (IR)



**Application.** IR systems are sensitive to the infrared portion of the electromagnetic spectrum. In order to produce a differentiated image they rely on heat gradients, i.e., varied infrared energy reflected or produced by adjacent objects. Sometimes referred to as Thermal Imaging, IR is most useful during hours of darkness, but can be used effectively during daylight hours as well.

## Example of IR Imagery





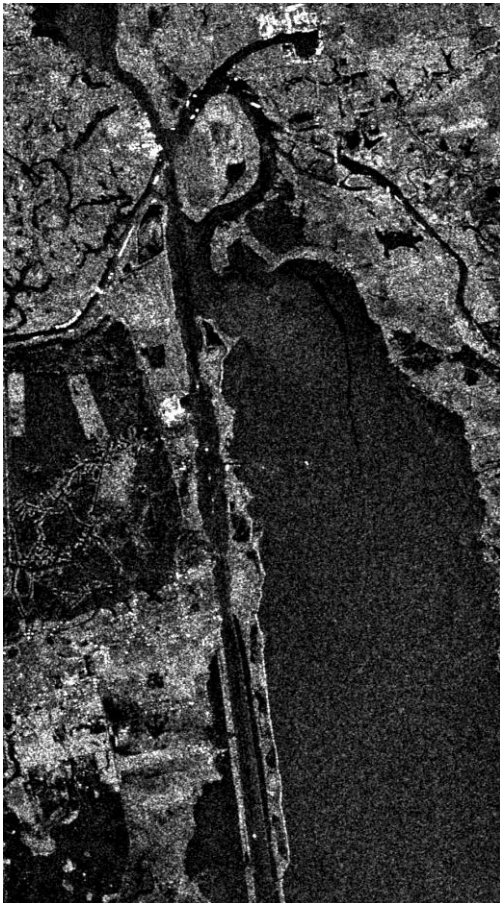


# Section 4

## Synthetic Aperture Radar (SAR)



**Application.** Synthetic-aperture radar (SAR) is a form of radar in which the large, highly-directional rotating antenna used by conventional radar is replaced with many low-directivity small stationary antennas scattered near or around the target area. The many echo waveforms received at the different antenna positions are post-processed to resolve the target. SAR can only be implemented by moving one or more antennas over relatively immobile targets, by placing multiple stationary antennas over a relatively large area, or combinations thereof. SAR has seen wide applications in remote sensing and mapping.



Examples of SAR Imagery



# Section 5

## Full-Motion Video (FMV)



**Application.** FMV is used herein to refer to live, real-time streaming video collected primarily for the immediate situational awareness of key decision makers. This is not to say that subsequent analysis on the images will not be conducted and disseminated. Nor should this be confused with video collected, but not disseminated until the aircraft has returned to base. It includes any live video across the electro-magnetic spectrum, but normally it will be EO or IR. Its main uses include:

- ☐ Search and Rescue
- ☐ Lines of Communication (LOC) Analysis
- ☐ Initial Damage Assessment (DA)
- ☐ Fire Perimeter Identification
- ☐ Situational Awareness (SA)

### Examples of FMV



**FMV taken of Gulf Coast Oil Platform Venting Gas after 2008 hurricane season**



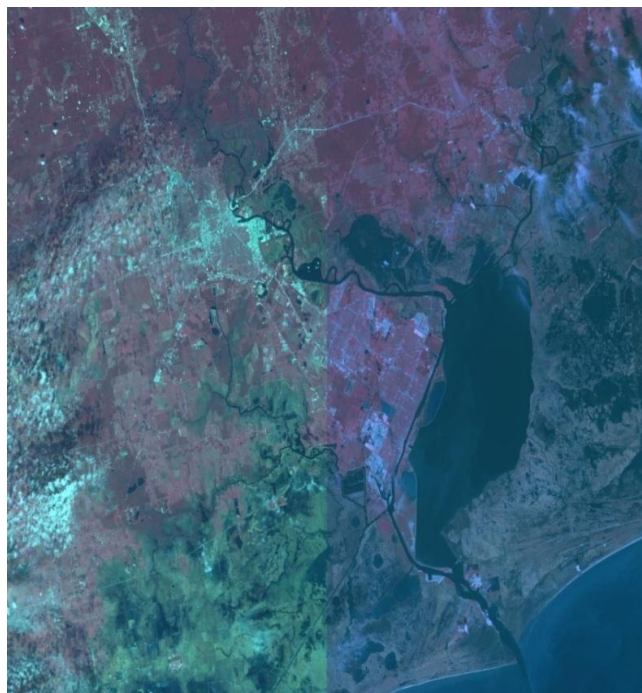


# Section 6

## Multi-Spectral/Hyper-Spectral Imagery (MSI/HSI)

**Application.** MSI and HSI use many bands within the Infrared, Visible and Ultraviolet portions of the electromagnetic spectrum to provide composite images produced by interpreting several layers of information. They are particularly useful at identifying chemicals, locating camouflaged objects, and providing change and anomaly detection. MSI/HSI systems are passive and require a light source to operate, making them less useful during hours of darkness. This type of imagery normally requires a trained analysts to interpret. Customers should consider this factor when requesting this type of imagery to ensure that the proper support personnel are included for the tasked asset.

### Examples of MSI/HSI



**MSI photos taken of Port Arthur, Texas during 2008 hurricane Season**

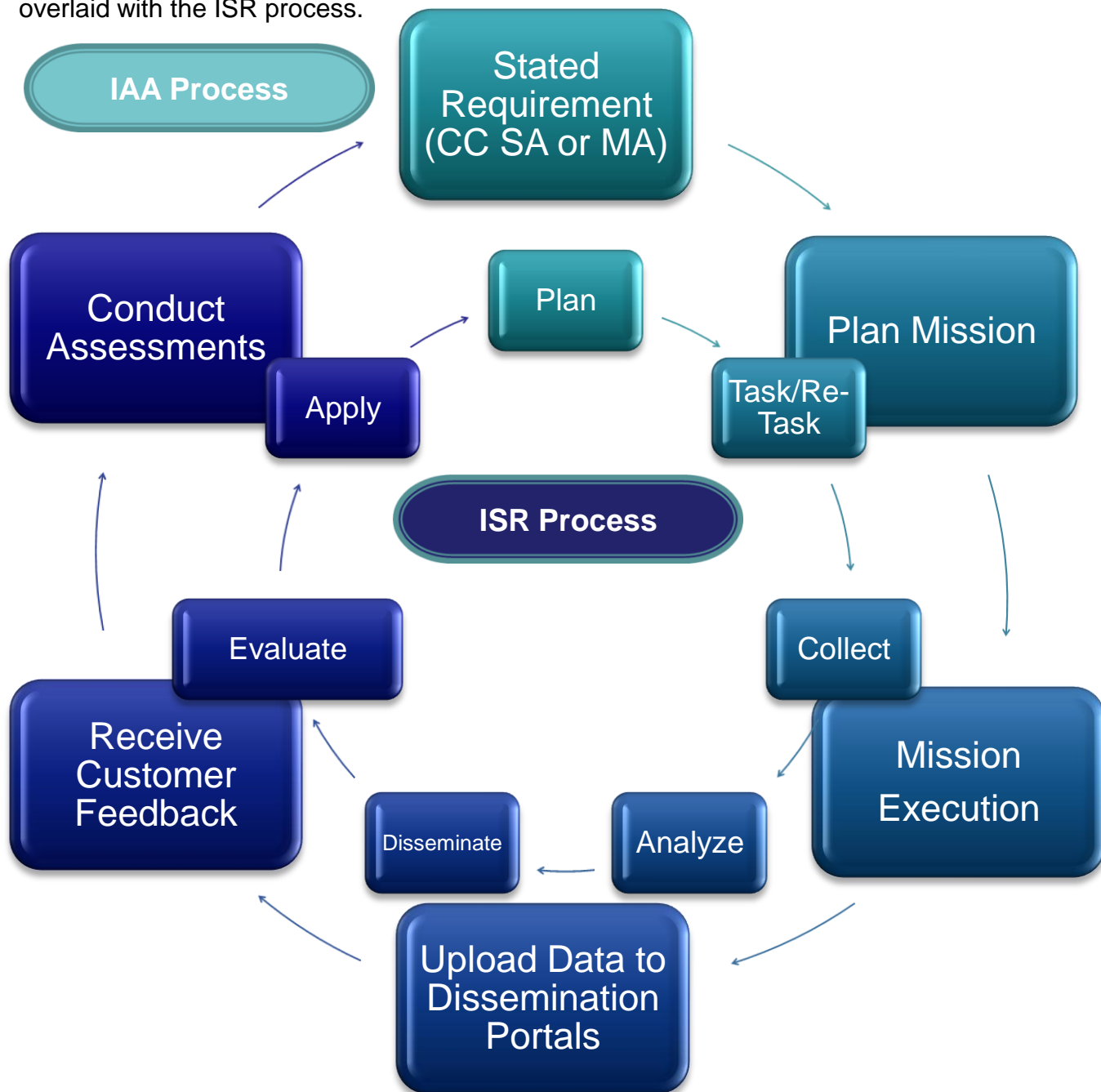


## Section 7

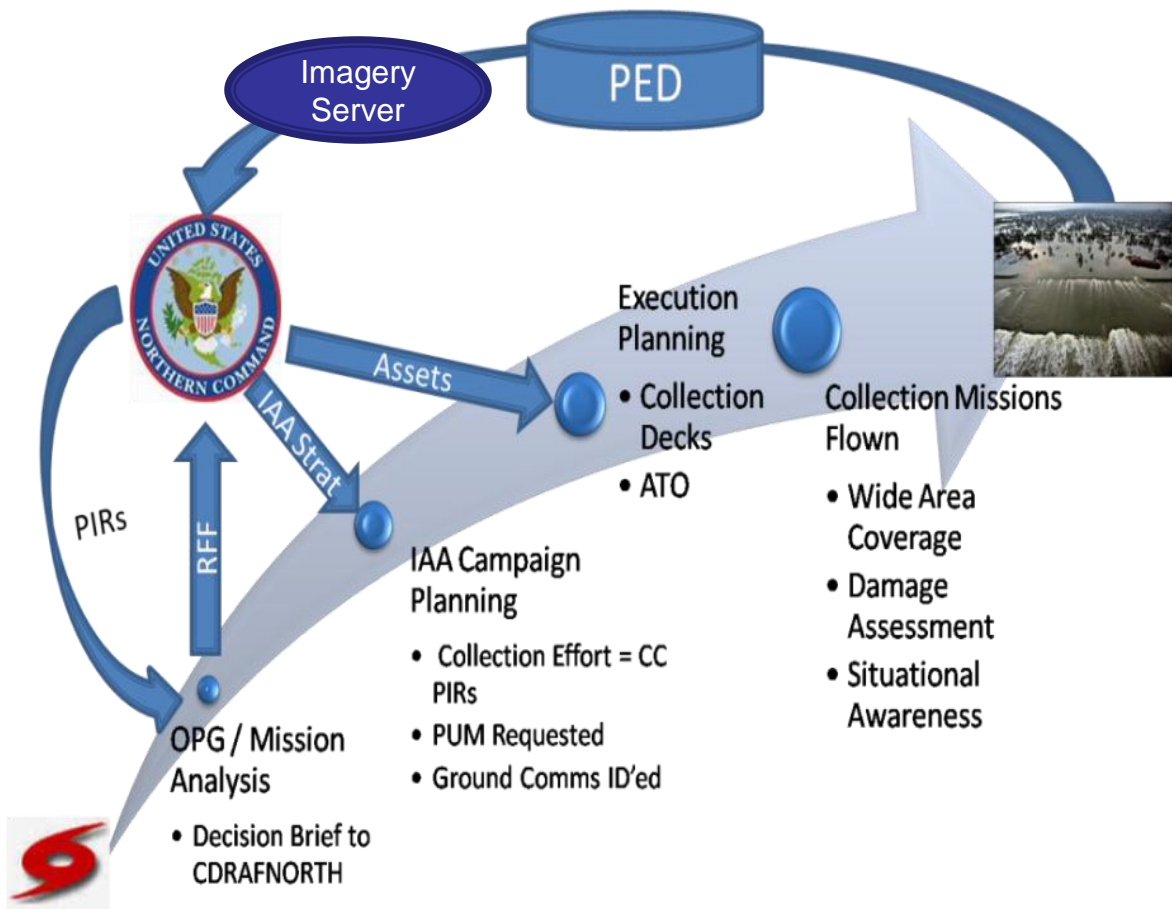
# Incident Awareness and Assessment Process (IAA)

### How to initiate an IAA Requirement

Incident Awareness and Assessment (IAA) Process. As described earlier, the IAA process is similar to the ISR process used abroad. The following graphic depicts the IAA process overlaid with the ISR process.

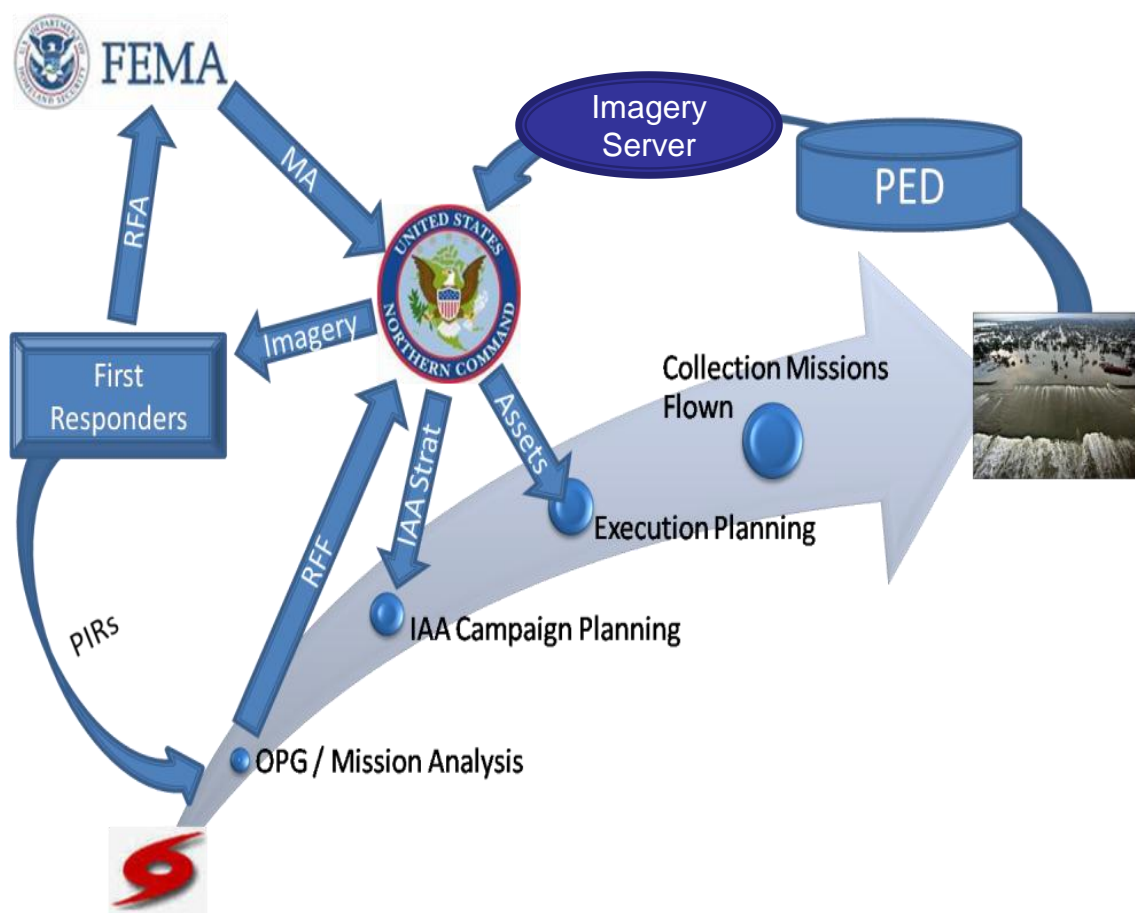


**Without Mission Assignment (MA).** There are several implications to consider when planning missions without an official mission assignment. Commander's intent and Priority Intelligence Requirements (PIRs) are critical and must be identified early before a collection plan is created. All missions flown without an MA are funded from within the Department of Defense. Information sharing with first responders is problematic or not authorized without a Mission Assignment (MA). In addition, Request for Forces (RFF) are more demanding because sourcing forces prior to a stated requirement from a PA makes it more difficult to justify the request. However, Command and Control issues are relatively simple as a straight forward military chain of command is in place.





**With Mission Assignment (MA).** There are separate considerations and implications to consider when an MA has been received. First, the assumption is made that first responders have been overwhelmed by the time the Request for Assistance has been received so defining requirements maybe a challenge. First responder's requirements are critical, however, dissemination architecture and connectivity to the first responders can be difficult at best. It is also important to note that military / civilian cooperation must keep in mind the different organizational cultures. DOD personnel, acting in an LNO role, must recognize that successful coordination will be built on personal relationships vice the formality of a military chain of command.



**Intelligence Oversight.** Intelligence Oversight limitations apply to AFNORTH and any supporting DOD unit that could collect, analyze, process, retain, or disseminate information on US persons and those who exercise command over these units and organizations. It applies to all military and civilian personnel assigned or attached to those units on a permanent or temporary basis, regardless of specialty or job function. It also applies to contractors or consultants if they are involved in activities subject to the procedures in DOD 5240.1-R. For Air Force Reserve Command, this AFI applies to Traditional Reservists, Air Reserve Technicians, Individual Mobilization Augmentees, and other Air Force Reserve Command members assigned or attached to intelligence units and staffs who are performing intelligence-related activities. For the Air National Guard (ANG), it applies to all ANG members in a Title 10 or Title 32 status assigned or attached to intelligence units or staffs who are performing intelligence-related activities.

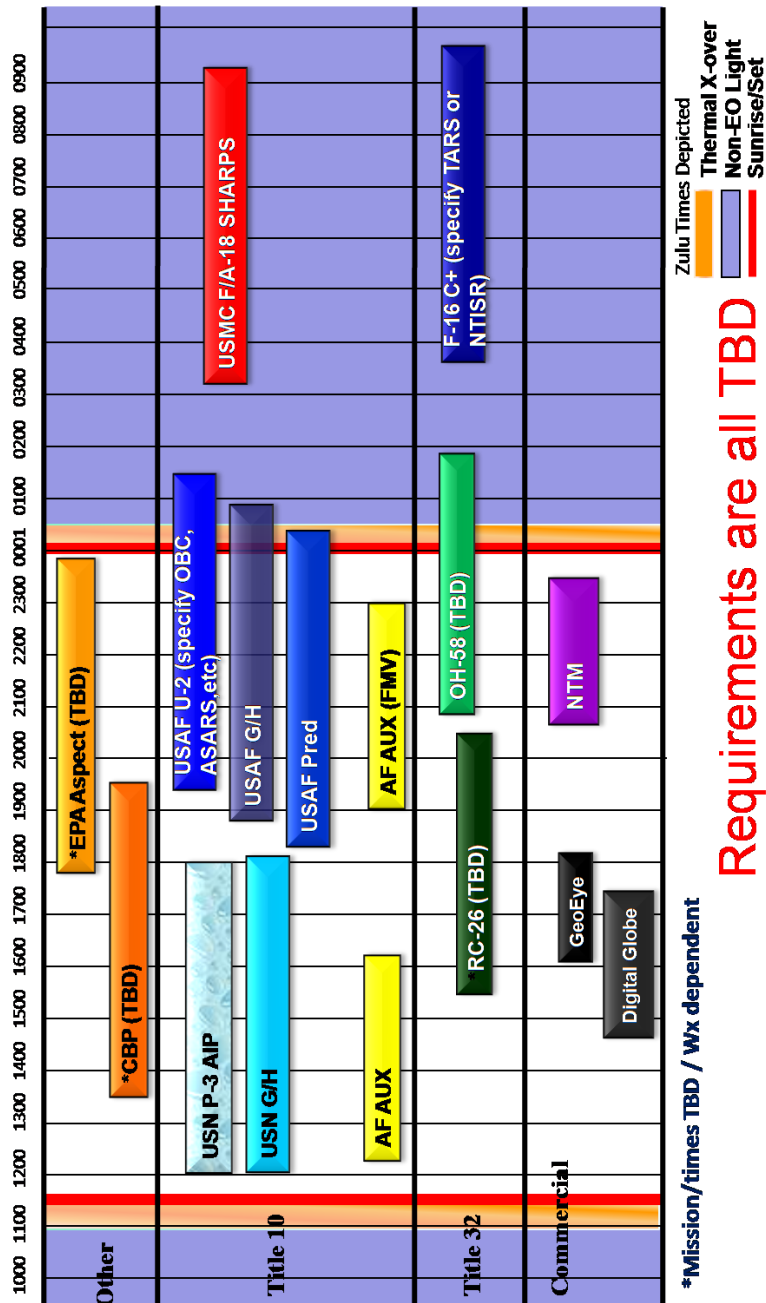
**Proper Use Memorandum (PUM).** When it is required for aerial intelligence collection within the USNORTHCOM AOR, J23M (Requirements Branch) drafts a Domestic Imagery Request (DIR) or PUM. The PUM clearly describes the boundaries and limits under which Intelligence Community personnel will be conducting operations in support of the DSCA mission. When it is determined that domestic imagery is required to satisfy an intelligence need or to support a designated Local Field Activity (LFA), the requesting command or component notifies the USNORTHCOM J23M, the JIOC-N Operations Officer (J23DO), or Knowledge Management Branch (J22S), and the Geospatial Intelligence (GEOINT) Operations Team for coordination. Notification will be followed-up by a written request, preferably through COLISEUM. Current DOD guidance (DIA/CLM-1/R 282305Z NOV 01) allows individual services and Commands to approve “domestic airborne reconnaissance” (manned and unmanned) imagery proper use memorandum for both military and private property. This guidance delegates to the Services and Commands the responsibility to review DOD 5240.1-R for compliance and encourages legal review by the servicing legal office. Unresolved issues are to be referred to Service or DOD General Council for determination. In some cases, a locally drafted and locally held PUM is sufficient to meet requirements. AFNORTH/A2 and JA will work with USNORTHCOM/J23M and JA to ensure that the appropriate legal documents are drafted and approved. The AFNORTH A2 Intelligence Oversight Monitor in coordination with the AFNORTH/JA will coordinate with USNORTHCOM/J23M and ensure that the appropriate documentation is approved prior to conducting IAA operations within the CONUS.

**Plan Mission.** In order to plan an effective mission AFNORTH IAA Planners need a detailed understanding of the requirement(s). The following IAA request form will initiate this process and help planners determine the proper platform, product and dissemination strategy.

Request for CFACC IAA Support							
Unit Tracking Number							
Customer/Intruder Email Address							
Date/Time of Request							
Required Product: (FMV, EO, IR, etc)							
Request originated by							
What is the Event/Operation							
Justification							
Dissemination Requirement							
Confidentiality							
ID#	Pri	State	Location Name	Location Description	Lat	Long	Essential Elements of Information (EEI) / What are you looking for?
1				Railroad bridge (north of I-10 bridge)	301417N	931410W	Report the presence of personnel in distress (SAR), locations of large scale flooding, status of LOC, dam levees, and the presence of hazmat contamination in the vicinity of tasked coordinates and DSAs
				Reporting Instructions		Special Instructions	
				Upload Imagery into the following path: <a href="http://edotip.or.usgs.gov/publicuser/morse/incoming/">http://edotip.or.usgs.gov/publicuser/morse/incoming/</a> (upload imagery into applicable folder). Once the data move has been completed, send an email with a dissemination summary (including # of images uploaded and any other amplifying data) to: <a href="mailto:cgacke@usgs.gov">cgacke@usgs.gov</a> , <a href="mailto:monrigherry@usgs.gov">monrigherry@usgs.gov</a> , <a href="mailto:601acdrisd.support@tyndall.af.mil">601acdrisd.support@tyndall.af.mil</a> , <a href="mailto:ingrca-nrbjoc2@ngc.army.mil">ingrca-nrbjoc2@ngc.army.mil</a>			

**IAA Synchronization Matrix (Sync Matrix).** AFNORTH (601st IRD) collection planners produce a Synch Matrix in order to ensure that all tasked assets are deconflicted, both from one another and from other government agency assets. The effect of the Synch Matrix is unified effort despite not having a unified chain of command or unified air tasking order (ATO). The following Synch Matrix was produced during the 2008 Gulf Coast hurricane season and is provided as an example.

## *IAA Synch Matrix Sunday, 14 Sep 2008*



**Collection Deck.** To task a platform, the AFNORTH (601st IRD) produces detailed collection plans. They include an Microsoft Excel spreadsheet identifying the specific collection points or the parameters of a directed search area. In addition, a Microsoft PowerPoint slide is produced to graphically depict the overall day's collection activity.

A	B	C	D	E	F	G	H
1							UNCLASSIFIED
2	Unit Tracking Number						Request for CFACC Reconnaissance Support
3	Customer/Unit/POC #/email etc.						
4	Date/Time of Request						
5							
6							
7	Required Product: (FMV, EO/IR etc)			Full Motion Video, EO/IR			
8	Request originated by			LA NG JOC			
9	What is the Event/Operation			Gustav Hurricane Response			
10							
11	Product Dissemination Requirement: (email						
12	Classification of products			UNCLASSIFIED			
13							
TGT #	TGT Name	Lat	Long	EEI	LTIOV	PERIODICITY	RECOMMENDED SENSOR
4	OUACHITA PARISH CD	322953N	092423W	Report the presence of personnel in distress, locations of flooding, status of LOC, dams/levees, and the presence of hazard	#####		EO/IR
9	BEAUREGARD PARISH OHS	305031N	0931702W	Report presence of personnel in distress, location of flooding, chemical/radiation leaks and the presence of hazard	#####		EO/IR
16	BIENVILLE PARISH OHS	323250N	0925532W	Report the presence of personnel in distress, locations of flooding, status of waterway, dams/levees, and the presence of hazard	#####		EO/IR
17							
17	CADDO EMERGENCY OPS C	323011N	0934517W	Report damage to bridge, passability, and hazmat contamination on the bridge	#####		EO/IR
18							
20	CLAIBORNE PARISH OHS	324730N	0930318W	Report presence of personnel in distress, location of flooding, chemical leaks and hazmat contamination in the vicinity	#####		EO/IR
19							
24	EAST CARROLL PARISH OHS	324814N	0911025W	Report the presence of personnel in distress, locations of flooding, status of LOC, dams/levees, and the presence of hazard	#####		EO/IR
20							
25	COCAINT PARISH OHS	313100N	0902126W	Report the presence of personnel in distress,	#####		EO/IR
21							



**Mission Execution.** Title 10 missions are formally tasked through the ATO process. The ATO directs a subordinate flying unit to execute the IAA missions. It contains the following details:

- ☐ Mission number
- ☐ Flight details
- ☐ Take off Time
- ☐ Time on Station
- ☐ Etc

The Reconnaissance, Surveillance, Target Acquisition Annex (RSTA) provides amplifying information to the aircrew and directs the format and content of the Post Mission Summary (described later in this volume). The RSTA Annex also provides detailed instruction for Processing, Analysis and Distribution (PAD) requirements.

**Dynamic Re-tasking.** Dynamic Re-tasking allows for the collection of time-sensitive IAA. The Chief of Combat Ops (CCO) within the AFNORTH Combat Ops Division (COD) determines if an asset can be re-tasked. The CCO does this on recommendation from the Senior Intelligence Duty Officer (SIDO) and the decision is subsequently relayed to the platform through the controlling Sector

**Dissemination.** Dissemination is based on user needs as determined by the IAA Request Form. Every effort is made to ensure the final product is unclassified and in a usable format. The most common form of dissemination used is the Imagery and FMV access portals as listed below.

**Pull – Posted to website(s).** Typically the United States Geological Survey (USGS) will host the majority of the imagery products on their Hazard Data Distribution System (HDDS) server. In addition, material may be posted to the Homeland Security Information Network (HSIN), and the USNORTHCOM Imagery/FMV server aka the Disaster Imagery Management Server (DIMS).

**Push** – Customers can specify whether they need products e-mailed or mailed directly to them. For example Civil Air Patrol has the capability to email imagery directly to customer while airborne via a satellite telephone. (Note: The satellite Constellation used for this capability is degrading and is occasionally intermittent).

**Live Feed** – Live feeds are accessed through a FMV portal or directly down-linked to the customer. Primary FMV customers will be collocated with a communications package (i.e. ROVER, DRAGOON, etc) that will allow them to have an immediate direct FMV feed while in the field. Additionally, FMV feeds will be pushed to the USNORTHCOM FMV server for the benefit of the remainder of the IAA community.

## Unclassified Imagery Access Portals

### United States Geological Survey Hazard Data Distribution System

- ☐ Open Access: <http://hdds.usgs.gov/hdds>
- ☐ Restricted Access: [http://edcftp.cr.usgs.gov/disaster\\_restricted/](http://edcftp.cr.usgs.gov/disaster_restricted/)

### NORTHCOM Disaster Imagery Management System (CAC Access required for the portal, User Name and Password required for the server)

- ☐ <https://operations.noradnorthcom.mil/sites/NNCJ2/NNCJ22/DSCA/DIMS/default.aspx>

### Department of Homeland Security's Homeland Security Information Network (HSIN) (Registration Required)

- ☐ <https://government.hsin.gov/default.aspx>

### TAGSWeb (Classified USN Global Hawk Imagery)

- ☐ [http://www.ghmd.navair.navy.smil.mil/GHMD\\_Web](http://www.ghmd.navair.navy.smil.mil/GHMD_Web)
  - ☐ Contact the AFNORTH (601st IRD) PED Team via SIPRNET for log in information
  - ☐ [601aocisrdpedteamomb@afnorth.af.smil.mil](mailto:601aocisrdpedteamomb@afnorth.af.smil.mil)

**Feedback.** In order to ensure that customer requirements are satisfied it is essential to collect post mission feedback from both the aircrew as well as the customer. Aircrew feedback will be in the form of a post mission summary as defined in the RSTA Annex to the Air Tasking Order (ATO). Customer feedback is sought through various Liaison Officers (LNOs) either in person or through telephone and e-mail exchanges to determine whether requirements were satisfied. This information is then used to determine the need for follow-on missions. A blank questionnaire can be found on the next page.

## ***CUSTOMER FEEDBACK QUESTIONNAIRE***

### Customer Information:

Unit:
POC:
Address:
City:
State:

Phone:
DSN:
STU/STE:
NIPRNET Email:
SIPRNET Email:

### Questionnaire

1. Was the imagery useful?
2. Was the imagery received in a timely manner?
3. Were any actions taken as a result of the product provided?
4. Did product provided satisfy the requirement?
5. Please provide any recommendations for the 601<sup>st</sup> AOC IRD in order to better support your imagery needs in the future:

### 601 AOC PED Contact info (DSN 523):

PED Chief: Capt Caesar Kellum (850) 283-5178 [caesar.kellum@tyndall.af.mil](mailto:caesar.kellum@tyndall.af.mil)  
NCOIC: TSgt Michael Squier (850) 283-5708 [michael.squier@tyndall.af.mil](mailto:michael.squier@tyndall.af.mil)  
PED Operations: SSgt Erica Kapreilian (850) 283-5734 [erica.kapreilian@tyndall.af.mil](mailto:erica.kapreilian@tyndall.af.mil)  
PED Operations: Mr. Todd Talbot (850) 283-5698 [todd.talbot@tyndall.af.mil](mailto:todd.talbot@tyndall.af.mil)

**Assessments.** The majority of operational efficiency is measured using operational metrics. Examples of information traditionally included in operational metrics are: IAA missions scheduled vs. missions flown, IAA sensor and communication link operational rates, imagery target deck collection rates (imagery targets tasked vs. imagery targets collected), ad hoc or dynamic re-tasking satisfaction rates (requested vs. successfully tasked, timeliness of collection and reporting, etc.) and on-station, in time, full mission, no problems (platform, sensor, links and crew).



The assessment process is used to evaluate the overall effectiveness of the IAA campaign. The process seeks to:

- ☐ Evaluate the effectiveness and efficiency of operations in achieving CFACC/JFACC objectives
- ☐ Evaluate the effectiveness of CFACC/JFACC objectives in supporting CFC/JFC objectives
- ☐ Recommend changes in weight, priorities or phasing efforts
- ☐ Provide predictive evaluation/assessment

Data is collected and analyzed after every IAA mission as the latest information is integrated into the cumulative totals. Additionally, an overall assessment is accomplished upon the completion of the contingency. Lessons Learned are captured in order to improve current processes and amend doctrine as required. The following table is an example of recently collected assessment totals.

Collectively, the Feedback and Assessments process ensures IAA assets are employed as efficiently and effectively as possible.

UNCLASSIFIED

### Hurricane IKE IAA Assessment Results – 13-14 Sep 08

INT / SENSOR	Sorties		Dynamic Retaskings		Targets			FMV		Customers	Flight Hrs
	Planned	Executed	Approved	Denied	Tasked	Collected	Satisfied	Still Imagery	Hours		
USN RQ-4	1	1	*4	0	409	*514	*514	0	0	TX SOC	17.5
RC-26	6	6	UNK	UNK	UNK	UNK	UNK				15.9
CBP P-3	1	1	0	0	UNK	UNK	0	0	0	FEMA/TX	9.3
SCATHE VIEW / FMV	1	1	0	0	31	9	7	0	2.6	n/a	2.7
USN P-3	3	3	1	0	0	0	0	18	0	JPRC-331AEG	10.5
AF AUX	2	2	0	0	0	0	0	0	0	n/a	6.7
<b>Totals</b>	<b>14</b>	<b>14</b>	<b>5</b>	<b>0</b>	<b>440</b>	<b>523</b>	<b>521</b>	<b>18</b>	<b>2.6</b>		<b>62.6</b>

Operational Effects:

RQ-4 – Collection Breakdown : 514 ( 354 SAR, 11 EO, 41 IR)  
Only 364 chipped/identified for exploitation  
246 - Declassified and posted for dissemination - All SAR

Notes:

RQ-4 – Flew on 13, and 14 Sep.  
\* Specific collects for each approved dynamic re-tasking increased RQ-4 collects by 105.





# Section 8

## Ground Architecture



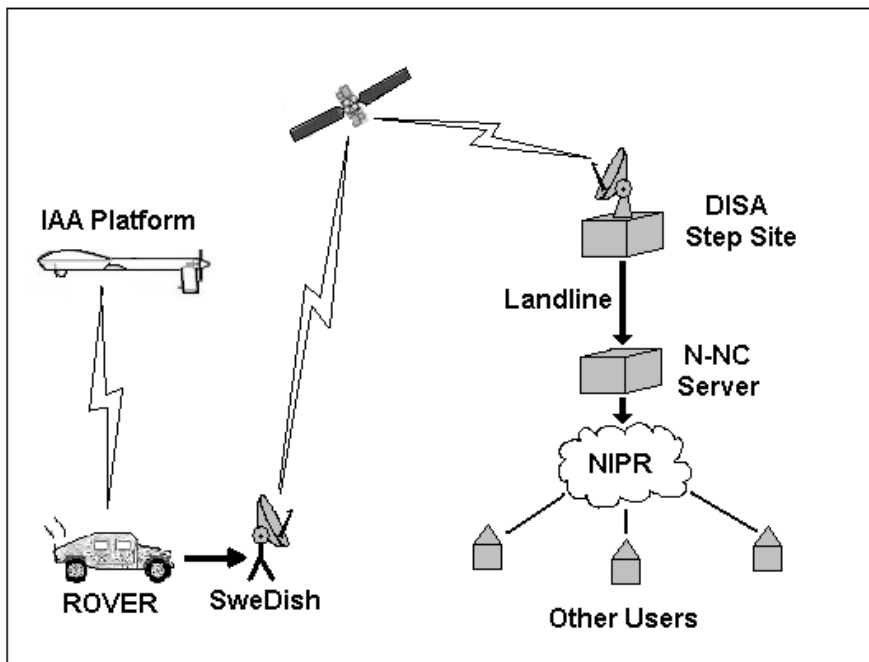
The basic architecture for the reception and transmission of FMV is the same regardless of platform used. It should also be noted that ANG forces utilizing the RC-26B aircraft are equipped with the Dragoon system, providing much higher video resolution and greater signal range than that available with the USA/USAF ROVER system.

The IAA platform transmits the video image from its sensor, normally via a C-band omnidirectional antenna. This restricts reception range to approximately 15 NM. ROVER receives the signal on the ground and reproduces the video on a ruggedized laptop system. Advanced ROVER systems are able to rebroadcast FMV via standard Ethernet links to other laptops/computer terminals, to a Personal Data Assistant (PDA), or to a satellite backhaul.



**ROVER in the field**

Reception by ROVER can be severely degraded by mountainous terrain, weather, frequency interference and other similar factors. Field use during DSCA scenarios typically result in ROVERs attempting to receive at ranges far greater than in wartime, overseas operations. What was designed to “see over the next hill” is being used to provide awareness over city sized areas. It is not uncommon for ROVERs employed in this manner to have great difficulty in maintaining signal reception from the collection platform.



Note: The HMMVV depicted represents a generic vehicle for ROVER mobility. The ROVER itself is depicted on the previous page.

Full Motion Video is provided to the on-site user at the ROVER terminal. If FMV is desired at a more distant location, a Swe-Dish or similar uplink terminal is used to convert and relay the signal through a DISA Teleport Step Site, then over leased landlines to the NORAD/USNORTHCOM FMV server. By this point, image degradation will be evident. Other users may view the FMV via NIPR connection, but with a further reduction in image clarity. FMV can also be disseminated via the Global Broadcast System (GBS).

**Swe-Dish.** One of the more important components in the Sensor-ROVER-FMV construct is the satellite inject point that provides the FMV signal to HHQ for dissemination via Web. The most common and most mobile option is the TSC-68 Swe-Dish (shown here).



The Swe-Dish should be paired with ROVER or Dragoon teams in the field to facilitate transmission of FMV to distant users via satellite link. Without the provision of a satellite uplink point, FMV is limited to local users in the immediate vicinity of the ROVER or Dragoon terminal. The Swe-Dish is highly mobile, weighing only 70 pounds.

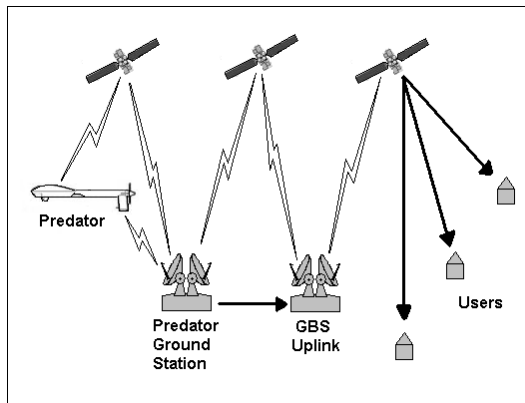
**Global Broadcast System.** The GBS operates as a one-way, wideband transmission service capable of supporting timely delivery of classified and unclassified data and information products for mission support and theater information transfer. GBS operates much like familiar satellite television broadcast systems. GBS disseminates IP-based real-time video and large data files (up to 4 GB) over-the-air (30 Mbps per transponder) to forces using smart push and user pull. For use within CONUS, the GBS receive suite located at AFNORTH HQ requires the use of a Theater Inject Point (TIP) to be fielded at an FMV source.

## Theater Inject Point.



The TIP is a trailerable satellite communications terminal normally consisting of two HMMWV and two trailers. The TIP is connected to the FMV source (ROVER, etc.) and pumps the FMV signal to the Horizons 1 satellite on a Ku-band signal. The signal is then redirected by a GBS transmit site in Norfolk, Virginia and can be distributed over the GBS network to more than 700 user terminals all over the world.

## Predator to Users via GBS



**USN/USA TCDL.** The Navy and Army use the Tactical Common Data Link (TCDL) for the majority of their FMV efforts. TCDL is a FMV link similar to the system used by ROVER, but it provides a greater extended range of transmission. TCDL links can operate at ranges of 100-150 NM as opposed to the short 15 NM range of a ROVER system. TCDL is a full duplex system allowing bi-directional information exchange over the link. TCDL transmissions are normally equipped with an encryption system that prevents reception by a ROVER system. In order for ROVER gear to acquire and receive signals, the TCDL must be reconfigured to transmit in an unencrypted mode acceptable to ROVER. The availability of TCDL ground packages are severely limited due to operations overseas. TCDL weighs approximately 2,200 pounds, requiring a large truck to move the system from point-to-point. In order to provide the FMV signal to distant users, TCDL must be linked to a Swe-Dish or other suitable satellite uplink system.



# Appendix I

## Associated Costs Table



Platform	Cost	Average Sortie Length
CAP C-182 w/SDIS	\$160/Hr	2-4 Hours
CAP GA-8 w/ARCHER	\$290/Hr	2-4 Hours
U-2 (i.e., SYERS)	\$6,700/Hr	10-12 Hours
U-2 (OBC)	\$12,500/Hr (Includes film)	10-12 Hours
RQ-4 Global Hawk	\$3,400/hr	24 Hours
OC-135 Open Skies	\$13,287/Hr	12-16 Hours
P-3 AIP	\$2,300/Hr (\$4,000/day to sit alert)	10-12 Hours
MQ-1 Predator	\$800/Hr (PED costs addt'l \$2000/hr)	18-20 Hours
MQ-9 Predator	\$1500/Hr (PED costs addt'l \$2000/hr)	18-20 Hours
RQ-7 Shadow	\$1,000/Hr	5 Hours
Eagle Vision	\$3,000-\$6500/Image (Resolution Dependant)	N/A
C-130 Scathe View	\$7,087/Hr	10-12 Hours
RC-26	\$1,966/Hr	5-6 Hours
TARS	\$6,000/Hour (varies with platform)	Varies by platform
E-8 JSTARS	\$13,616/Hr	12-16 Hours
OH-58	\$942/Hr	2 Hours



# Appendix II

## Preferred Assets



### Blizzard / Winter Storm

#### General Essential Elements of Information (EEIs):

- ☐ Report presence of personnel in distress
- ☐ Status of LOC
- ☐ Presence of isolated livestock
- ☐ Damage to critical infrastructure / other facilities

#### Prioritized Location of Interest:

- ☐ Distressed personnel
- ☐ Infrastructure damage
  - ☐ Roadways
  - ☐ Bridges
  - ☐ Power / comm lines
  - ☐ Supply routes
- ☐ Isolated livestock
- ☐ Airports
- ☐ Nuclear power facilities
- ☐ Other power facilities
- ☐ Hospitals
- ☐ Chemical / Biological sites
- ☐ Ports
- ☐ Dams / Levees



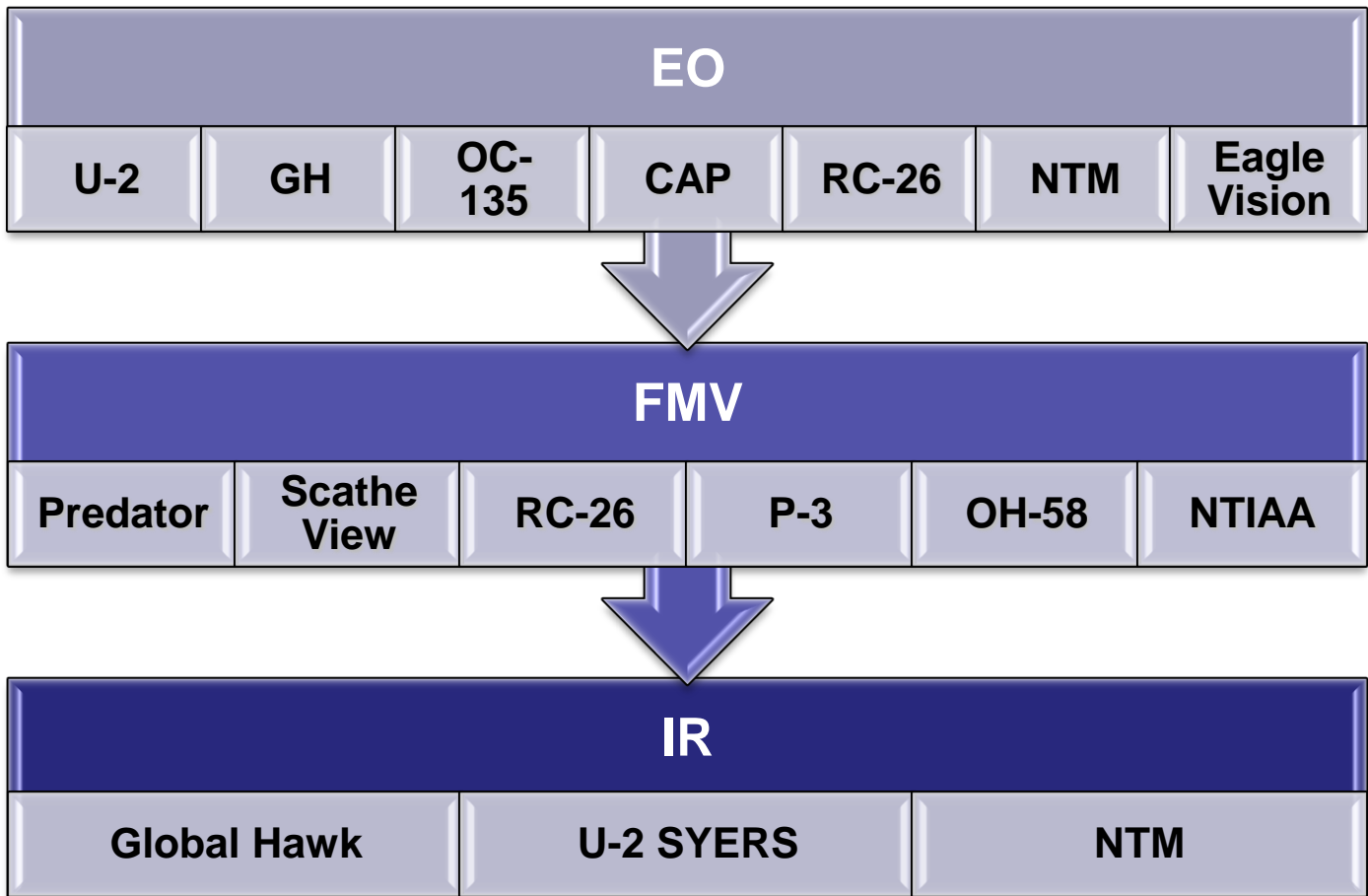
#### Websites:

- ☐ NOAA website (weather)  
<http://www.nws.noaa.gov>
- ☐ Open Source Imagery  
<http://earthobservatory.nasa.gov>  
<http://modis.gsfc.nasa.gov>



## Blizzard / Winter Storm

Note - Preferred platform is shown at the far left of each capability block, with the most important capability being shown on the top.



# Earthquake

## General Essential Elements of Information (EEl)s:

- ☐ Report presence of personnel in distress
- ☐ Status of LOC
- ☐ Status of dams and levees
- ☐ Damage to critical infrastructure and other facilities
- ☐ Presence of hazmat contamination

## Prioritized Location of Interest:

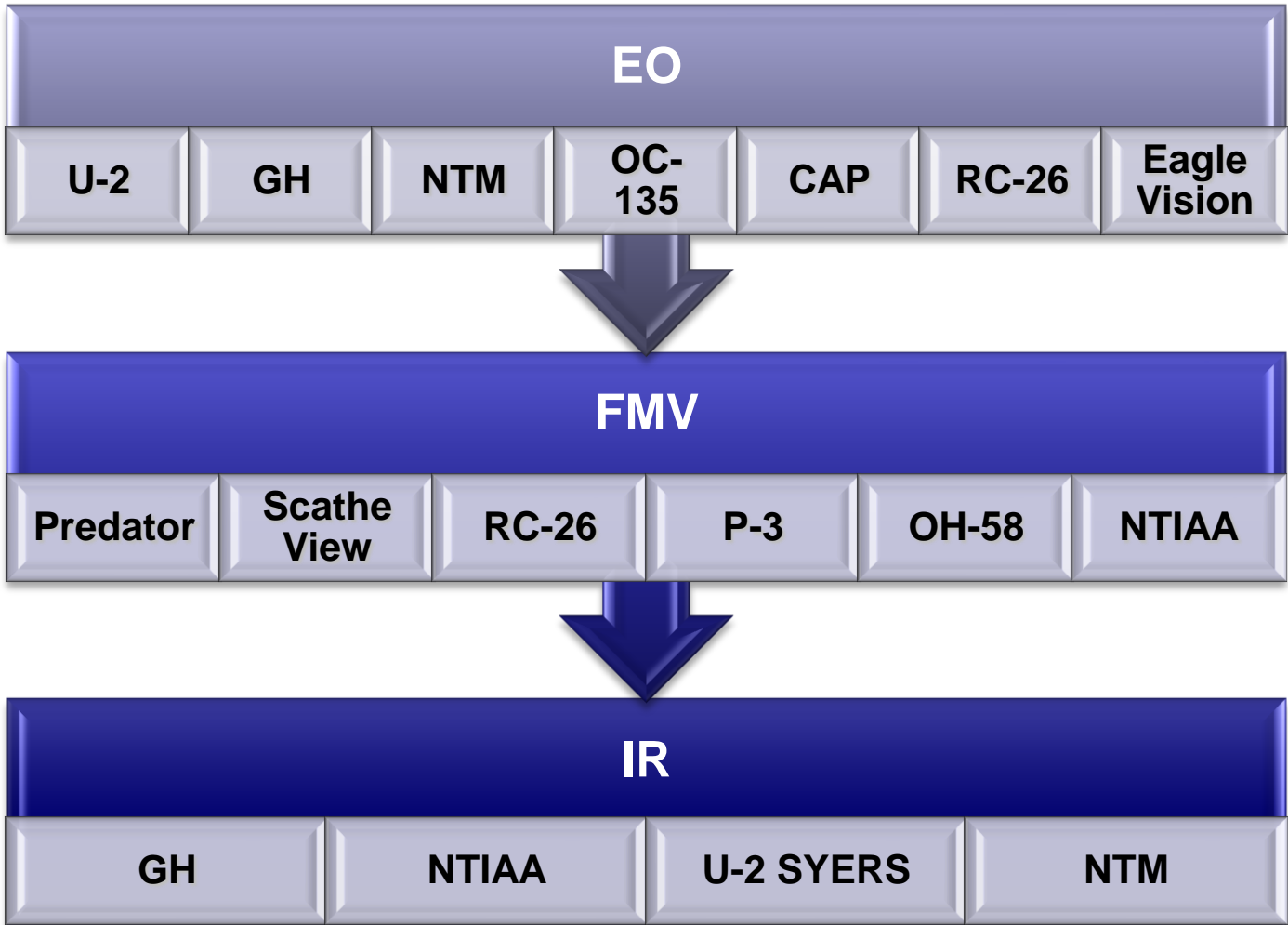
- ☐ Distressed personnel
- ☐ Infrastructure damage
  - ☐ DoD facilities
  - ☐ Roadways
  - ☐ Bridges
  - ☐ Power / comm lines
  - ☐ Supply routes
- ☐ Airports
- ☐ Nuclear power facilities
- ☐ Other power facilities
- ☐ Hospitals
- ☐ Chemical / Biological sites
- ☐ Ports
- ☐ Dams / Levees
- ☐ Structure damage to other buildings / houses within affected area



## Websites:

- ☐ NOAA website (weather)  
<http://www.nws.noaa.gov>
- ☐ Open Source Imagery  
<http://earthobservatory.nasa.gov>  
<http://modis.gsfc.nasa.gov>
- ☐ USGS website  
<http://earthquake.usgs.gov>

# Earthquake



# Flood / Tsunami

## General Essential Elements of Information (EEl)s:

- ☐ Report presence of personnel in distress
- ☐ Location of large scale flooding
- ☐ Status of LOC
- ☐ Status of dams and levees
- ☐ Damage to critical infrastructure and other facilities
- ☐ Presence of hazmat contamination

## Prioritized Location of Interest:

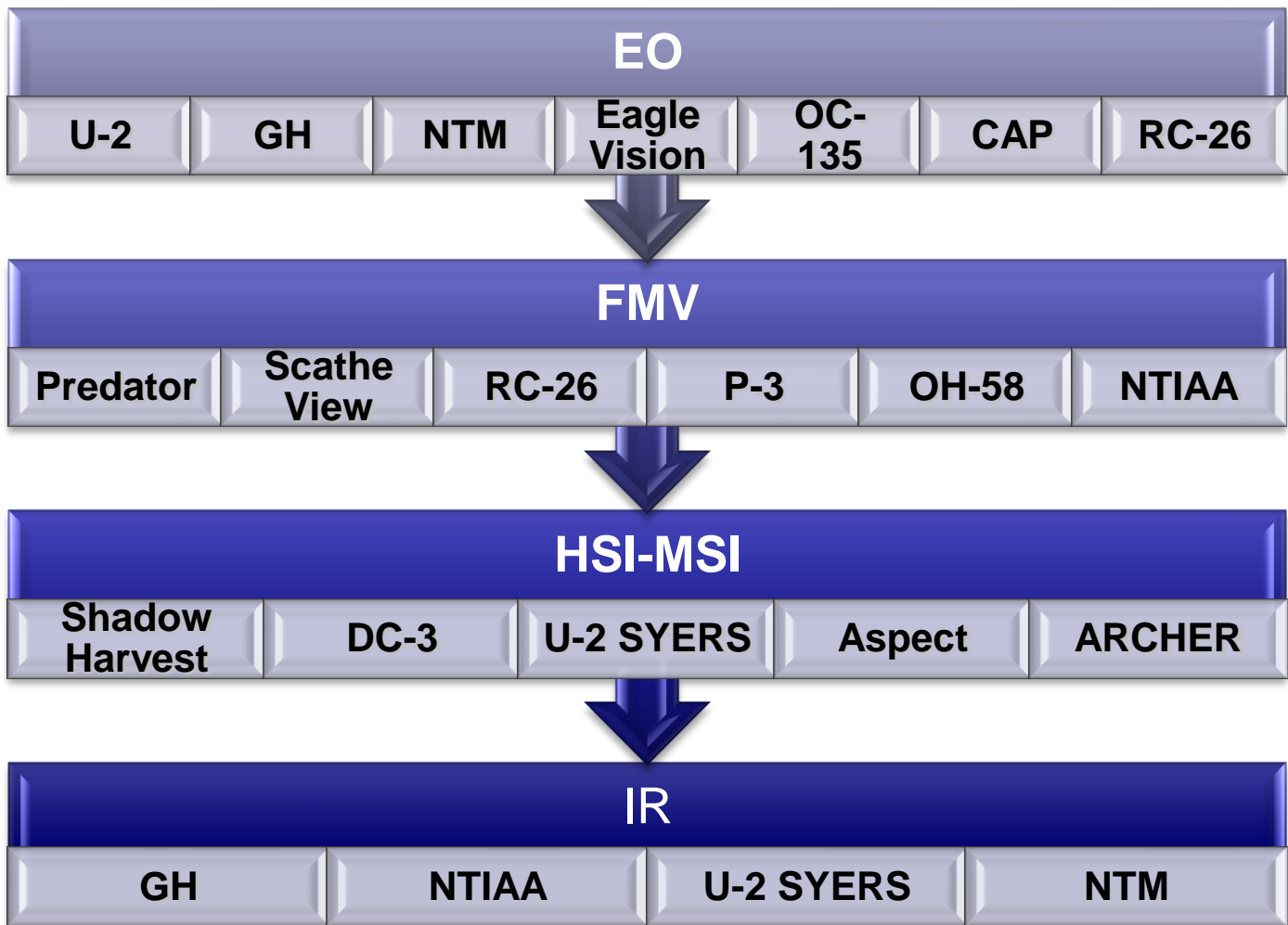
- ☐ Distressed personnel
- ☐ Flooded Area(s)
- ☐ Infrastructure damage
  - ☐ DoD facilities
  - ☐ Roadways
  - ☐ Bridges
  - ☐ Power / comm lines
  - ☐ Evacuation routes
- ☐ Airports
- ☐ Nuclear power facilities
- ☐ Other power facilities
- ☐ Hospitals
- ☐ Chemical / Biological sites
- ☐ Ports
- ☐ Dams / Levees
- ☐ Structure damage to other buildings / houses within affected area
- ☐ Pipelines



## Websites:

- ☐ NOAA website (weather)  
<http://www.nws.noaa.gov>
- ☐ Open Source Imagery  
<http://earthobservatory.nasa.gov>  
<http://modis.gsfc.nasa.gov>

# Flood / Tsunami





# Hurricane

## General Essential Elements of Information (EEIs):

- ☐ Report presence of personnel in distress
- ☐ Location of large scale flooding
- ☐ Status of LOC
- ☐ Status of dams and levees
- ☐ Damage to critical infrastructure and other facilities
- ☐ Presence of hazmat contamination

## Prioritized Location of Interest:

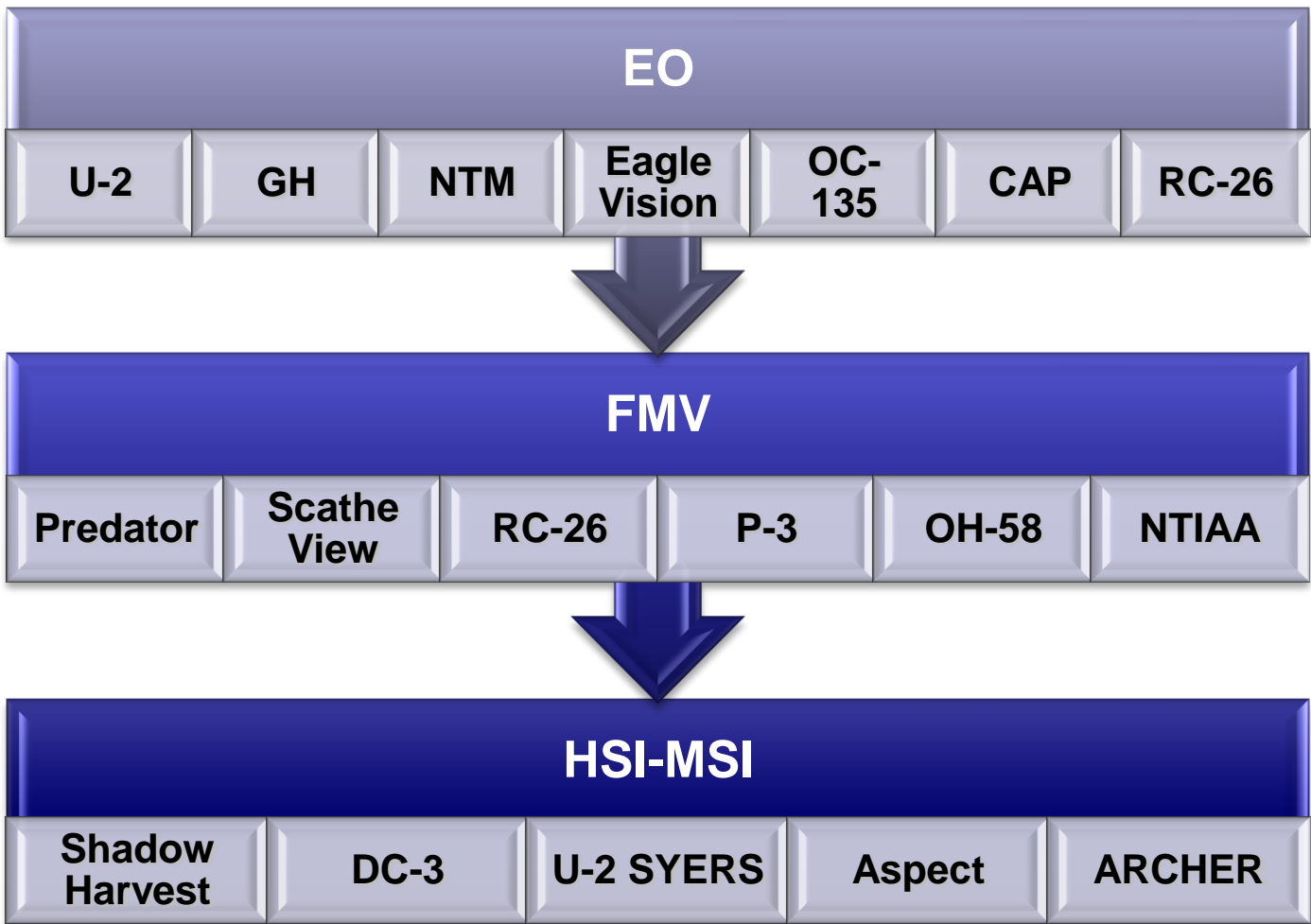
- ☐ Distressed personnel
- ☐ Flooded Area(s)
- ☐ Infrastructure damage
  - ☐ DoD facilities
  - ☐ Roadways
  - ☐ Bridges
  - ☐ Power / comm lines
  - ☐ Evacuation routes
- ☐ Airports
- ☐ Nuclear power facilities
- ☐ Other power facilities
- ☐ Hospitals
- ☐ Chemical / Biological sites
- ☐ Ports
- ☐ Dams / Levees
- ☐ Structure damage to other buildings / houses within affected area
- ☐ Pipelines



## Websites:

- ☐ NOAA website (weather)  
<http://www.nws.noaa.gov>
- ☐ Open Source Imagery  
<http://earthobservatory.nasa.gov>  
<http://modis.gsfc.nasa.gov>

# Hurricane



# Tornado

## General Essential Elements of Information (EEl)s:

- ☐ Report presence of personnel in distress
- ☐ Status of LOC
- ☐ Status of dams and levees
- ☐ Damage to critical infrastructure and other facilities
- ☐ Presence of hazmat contamination

## Prioritized Location of Interest:

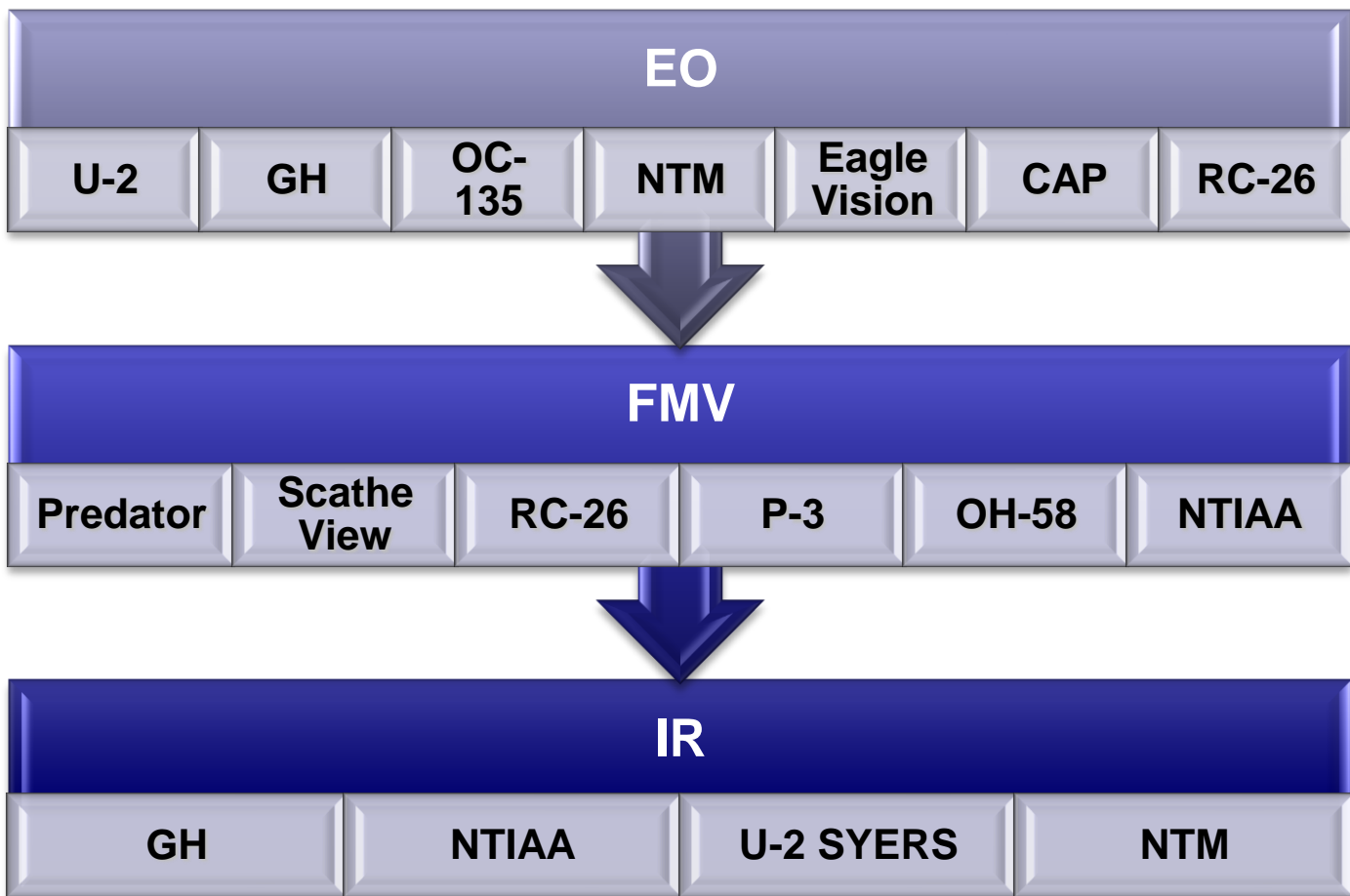
- ☐ Distressed personnel
- ☐ Infrastructure damage
  - ☐ DoD facilities
  - ☐ Roadways
  - ☐ Bridges
  - ☐ Power / comm lines
  - ☐ Evacuation routes
- ☐ Airports
- ☐ Nuclear power facilities
- ☐ Other power facilities
- ☐ Hospitals
- ☐ Chemical / Biological sites
- ☐ Ports
- ☐ Dams / Levees
- ☐ Structure damage to other buildings / houses within affected area
- ☐ Pipelines



## Websites:

- ☐ NOAA website (weather)  
<http://www.nws.noaa.gov>
- ☐ Open Source Imagery  
<http://earthobservatory.nasa.gov>  
<http://modis.gsfc.nasa.gov>

# Tornado



# Volcanic Eruption

## General Essential Elements of Information (EEIs):

- ☐ Report presence of personnel in distress
- ☐ Extent of volcanic effects
- ☐ Status of LOC
- ☐ Status of dams and levees
- ☐ Damage to critical infrastructure and other facilities
- ☐ Presence of hazmat contamination

## Prioritized Location of Interest:

- ☐ Distressed personnel
- ☐ Area impacted by volcanic effects
- ☐ Infrastructure damage
  - ☐ DoD facilities
  - ☐ Roadways
  - ☐ Bridges
  - ☐ Power / communication lines
  - ☐ Evacuation routes
- ☐ Airports
- ☐ Nuclear power facilities
- ☐ Other power facilities
- ☐ Hospitals
- ☐ Chemical / Biological sites
- ☐ Ports
- ☐ Dams / Levees
- ☐ Structure damage to other buildings / houses within affected area

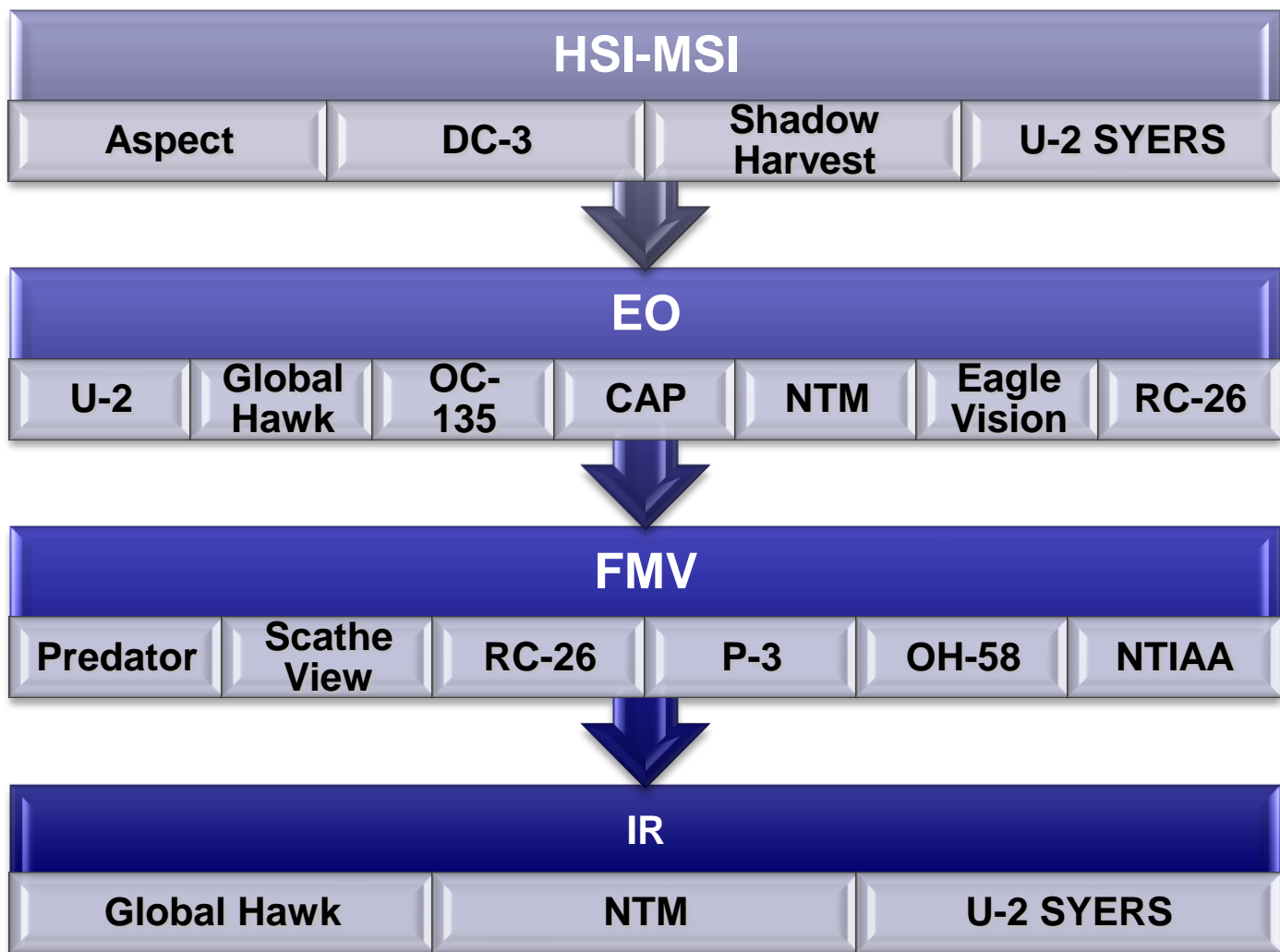


## Websites:

- ☐ NOAA website (weather)  
<http://www.nws.noaa.gov>
- ☐ Open Source Imagery  
<http://earthobservatory.nasa.gov>  
<http://modis.gsfc.nasa.gov>



# Volcanic Eruption



# Wildfires

## General Essential Elements of Information (EEl)s:

- ☐ Report presence of personnel in distress
- ☐ Status of LOC
- ☐ Damage to critical infrastructure and other facilities
- ☐ Presence of hazmat contamination

## Prioritized Location of Interest:

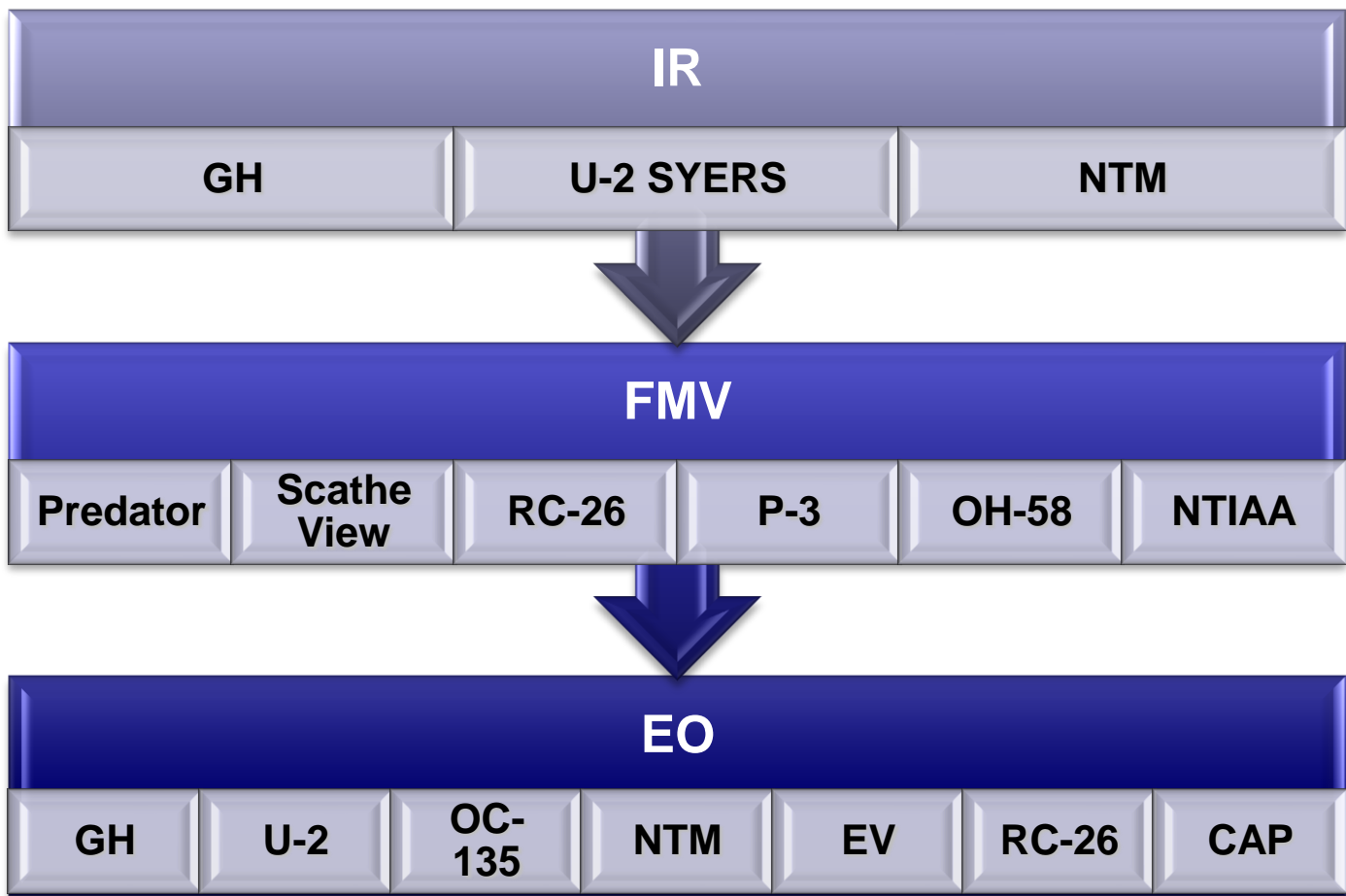
- ☐ Distressed personnel
- ☐ Infrastructure damage
  - ☐ DoD facilities
  - ☐ Roadways
  - ☐ Bridges
  - ☐ Power / comm lines
  - ☐ Evacuation routes
- ☐ Airports
- ☐ Nuclear power facilities
- ☐ Other power facilities
- ☐ Hospitals
- ☐ Chemical / Biological sites
- ☐ Ports
- ☐ Dams / Levees
- ☐ Structure damage to other buildings / houses within affected area



## Websites:

- ☐ NOAA website (weather)  
<http://www.nws.noaa.gov>
- ☐ Open Source Imagery  
<http://earthobservatory.nasa.gov>  
<http://modis.gsfc.nasa.gov>
- ☐ National Wildfire Incident reporting  
<http://www.inciweb.org>

# Wildfires



# Chemical Event

## General Essential Elements of Information (EEl)s:

- ☐ Report presence of personnel in distress
- ☐ Location of large scale flooding
- ☐ Status of LOC
- ☐ Status of dams and levees
- ☐ Presence of hazmat contamination

## Prioritized Location of Interest:

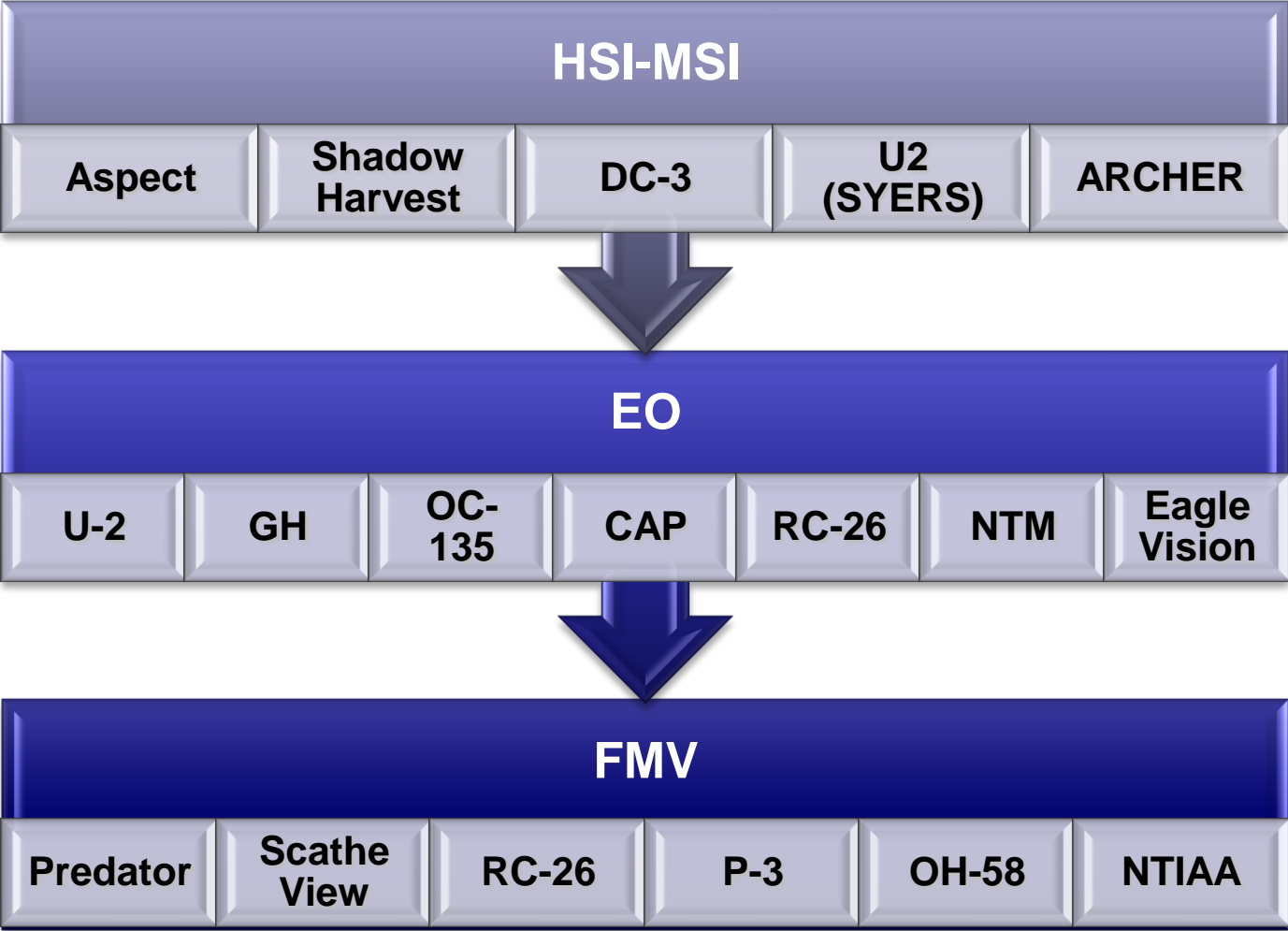
- ☐ Contaminated Area(s)
- ☐ Population Centers within affected area
- ☐ Distressed personnel
- ☐ Contaminated water supply / soil
- ☐ Infrastructure within affected area
  - ☐ DoD facilities
  - ☐ Roadways
  - ☐ Bridges
  - ☐ Evacuation routes
- ☐ Airports
- ☐ Nuclear power facilities
- ☐ Other power facilities
- ☐ Hospitals
- ☐ Chemical / Biological sites
- ☐ Ports
- ☐ Dams / Levees
- ☐ Pipelines



## Websites:

- ☐ NOAA website (weather)  
<http://www.nws.noaa.gov>
- ☐ Open Source Imagery  
<http://earthobservatory.nasa.gov>  
<http://modis.gsfc.nasa.gov>

# Chemical Event





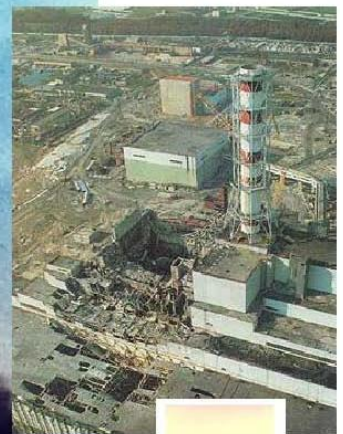
# Radiological Event

## General Essential Elements of Information (EEl)s:

- ☐ Report presence of personnel in distress
- ☐ Areas and extent of contamination
- ☐ Damage to critical infrastructure and other facilities
- ☐ Status of LOC
- ☐ Status of dams and levees
- ☐ Presence of hazmat contamination

## Prioritized Location of Interest:

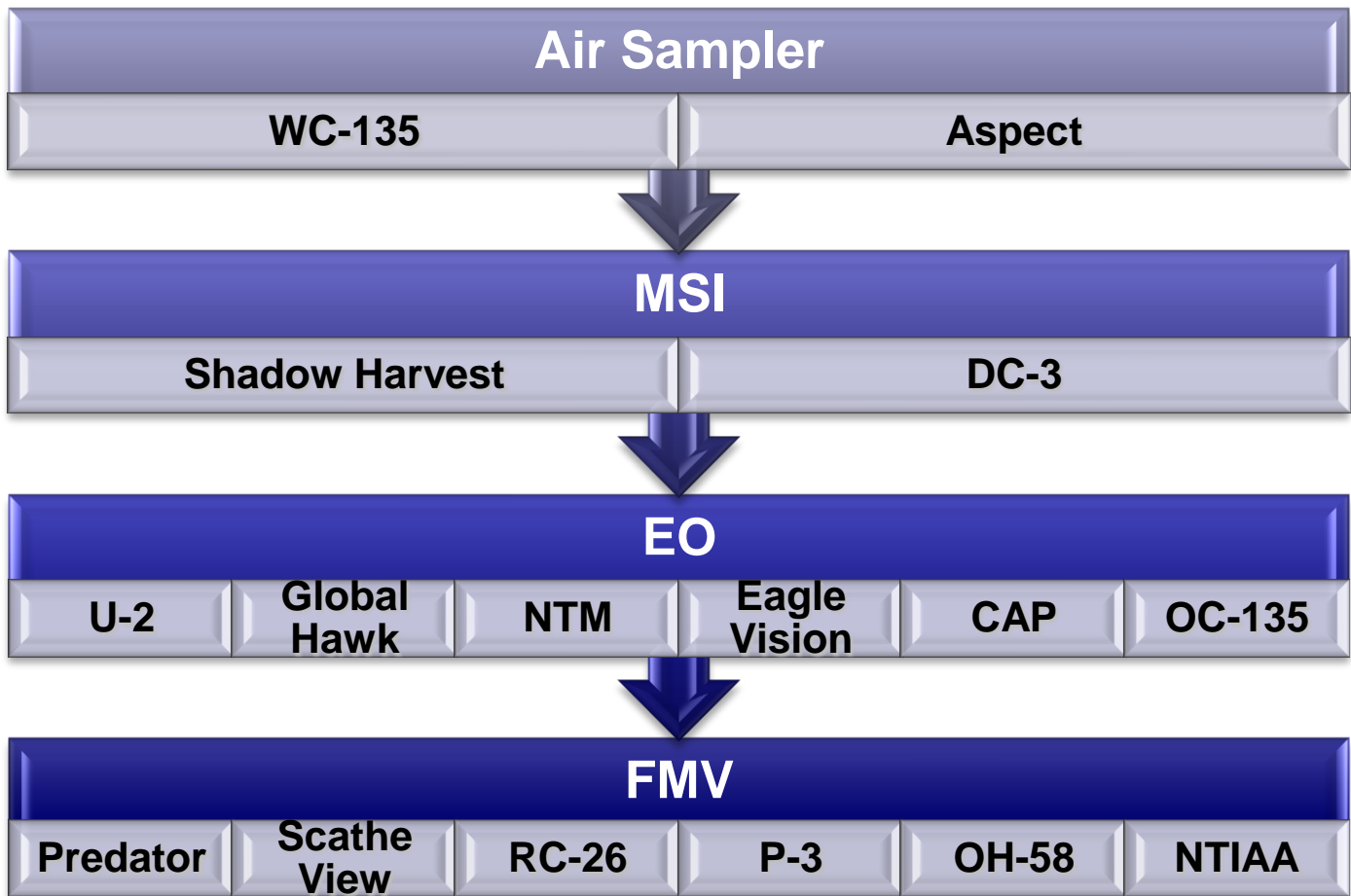
- ☐ Distressed personnel
- ☐ Radioactive Area(s)
- ☐ Evacuation Route(s)
- ☐ Infrastructure Damage
  - ☐ DoD facilities
  - ☐ Roadways
  - ☐ Bridges
- ☐ Airports
- ☐ Nuclear power facilities
- ☐ Other power facilities
- ☐ Hospitals
- ☐ Chemical / Biological sites
- ☐ Ports
- ☐ Dams / Levees



## Websites:

- ☐ NOAA website (weather)  
<http://www.nws.noaa.gov>
- ☐ Open Source Imagery  
<http://earthobservatory.nasa.gov>  
<http://modis.gsfc.nasa.gov>
- ☐ Unclass Intel Link  
[https://www.intelink.gov/wiki/Main\\_Page](https://www.intelink.gov/wiki/Main_Page)

# Radiological Event



# Terrorist Event

## General Essential Elements of Information (EEIs):

- ☐ Report presence of personnel in distress
- ☐ Damage to critical infrastructure and other facilities
- ☐ Status of LOC
- ☐ Status of dams and levees
- ☐ Presence of hazmat contamination

## Prioritized Location of Interest:

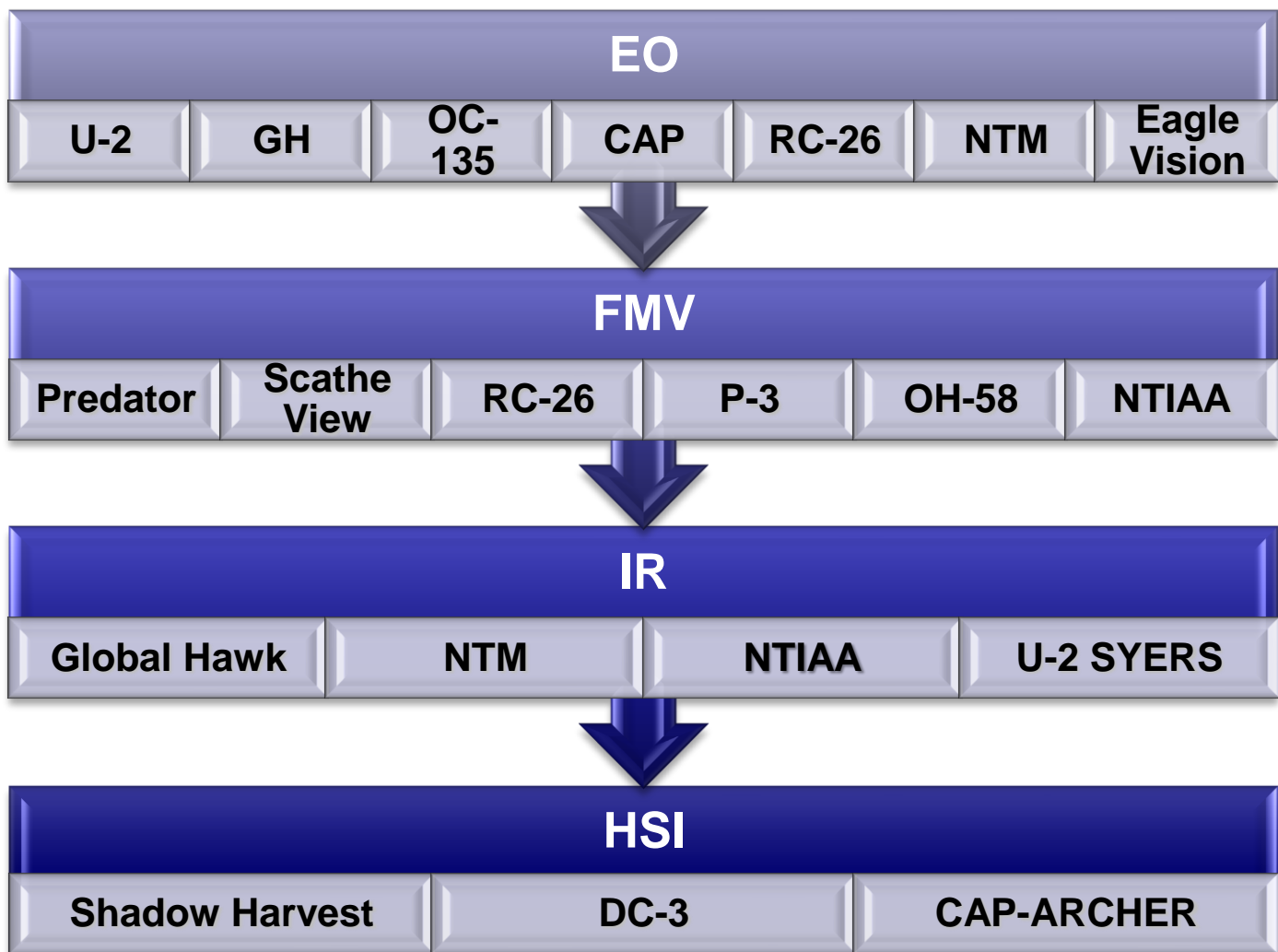
- ☐ Distressed personnel
- ☐ Damage Assessment within affected area
- ☐ Infrastructure Damage
  - ☐ DoD facilities
  - ☐ Roadways
  - ☐ Bridges
  - ☐ Power / comm lines
  - ☐ Evacuation routes
- ☐ Airports
- ☐ Nuclear power facilities
- ☐ Other power facilities
- ☐ Hospitals
- ☐ Chemical / Biological sites
- ☐ Ports
- ☐ Dams / Levees
- ☐ Pipelines



## Websites:

- ☐ NOAA website (weather)  
<http://www.nws.noaa.gov>
- ☐ Open Source Imagery  
<http://earthobservatory.nasa.gov>  
<http://modis.gsfc.nasa.gov>

# Terrorist Event





# Appendix III

## IAA Asset

## Descriptions



### **Title 10 IAA Assets**

The primary resource for DoD IAA platforms will be drawn from Title 10 assets. Contracted IAA assets may be utilized if available. The National Guard has organic IAA resources that will likely be utilized under State authority in coordination with AFNORTH.

### **Civil Air Patrol/USAF Auxiliary**

The Civil Air Patrol (CAP) is the official auxiliary of the United States Air Force. Civil Air Patrol flies more than 95% of all Federal inland search and rescue missions directed by the Air Force Rescue Coordination Center (AFRCC) at Langley Air Force Base, Virginia.

DOD policies that govern coordination and approval of requests for support to civil authorities normally do not apply to the Air Force Auxiliary (DSCA EXORD Para 1.F). The SECDEF has authorized the commanders of 1<sup>st</sup>AF and 11<sup>th</sup>AF to respond directly to civil-support requests, including those involving counter-drug activities, using the services of AF Auxiliary.

CAP performs disaster relief missions, air and ground transportation of responding personnel and provides a sophisticated nationwide communications network. CAP provides aerial photo platforms for many disaster relief responder agencies.



### **Satellite-transmitted Digital Imaging System (SDIS)**

**Brief:** The Satellite-transmitted Digital Imaging System (SDIS) allows CAP members to capture images from an airborne platforms and deliver those images in near real-time.

**Inventory:** 70

**Unit Location:** Systems located throughout the US.

#### **Commentary**

Images are collected with a commercial, off-the-shelf, hand-held digital camera. Images are downloaded to an onboard laptop computer and transmitted to a ground site via a RCOM-100 satellite phone. Aircraft can be deployed on relatively short notice to most locations where they are needed. The status and location of these aircraft can be found at the CAP Web Mission Information Reporting System (WMIRS) by logging in at:

<https://ntc.cap.af.mil/login.htm>



## **ARCHER**

**Brief:** Airborne Real-time Cueing Hyper-spectral Enhanced Reconnaissance is carried aboard one of 16 GA-8 Airvan.

**Function:** Multispectral/hyperspectral imaging, anomaly detection, and change detection.

**Inventory:** 16

**Unit Location:** Several locations throughout the US.

### **Commentary**

ARCHER is a custom-designed system of hyper-spectral imaging hardware and software to collect and exploit hyper-spectral imagery (HSI).

HSI is a technology that allows a sensor on a moving platform to detect and/or gather reflected radiation (light) from man-made or natural objects on the ground. ARCHER's HSI system allows CAP members to search the ground for objects having a specific spectral signature. Information relative to this signature is entered by the operator, allowing the HSI camera to detect the objects that match that particular electronic description. Since ARCHER's HSI technology is based on reflected light, so some small portion of the item must be exposed to light to be detected. ARCHER imagery may also be archived for later analysis.

ARCHER executes three separate algorithms for target acquisition and identification:

1) Spectral signature matching: detects specific spectral signatures using matched filters in order to find items, targets, etc. with known spectral properties.

Potential Missions: Counter Drug, Homeland Security

2) Anomaly detection: detects spectral anomalies (i.e., things that do not "belong").

Potential Missions: Search and Rescue, Disaster Relief

3) Change detection: detects changes over time through a pixel-by-pixel comparison.

Potential Missions: Homeland Security, Disaster Relief

ARCHER is keyed to the aircraft GPS navigation system to provide precise locational data for annotation to produced images. At any time during the flight, pan-sharpened HSI target image clips with their location information can be transmitted to ground observers. The pilot or flight crew receives flight situational awareness in the cockpit via the ARCHER TRAC display.

The status and location of the GA-8 aircraft and ARCHER systems can be found at the CAP Web Mission Information Reporting System (WMIRS) by logging in at:  
<https://ntc.cap.af.mil/login.htm>



## OC-135 Open Skies

**Brief:** A modified C-135 aircraft that flies unarmed observation and verification flights over nations that are parties to the 1992 Open Skies Treaty.

**Function:** Reconnaissance aircraft.

**Operator:** ACC. Sensor crews are manned by personnel from the Defense Threat Reduction Agency (DTRA)

**Inventory:** Two.

**Unit Location:** 55<sup>th</sup> Wing, 45<sup>th</sup> Reconnaissance Squadron, Offutt AFB, NE.



## **Commentary**

A modified version of the C-135 used for specialized arms control treaty observation and imagery collection missions with vertical-looking and panoramic optical cameras installed in the rear of the aircraft. OC-135B modifications include one vertical and two oblique KS-87E framing cameras, used for photography approximately 3,000 - 5,000 ft above the ground, and one KA-91C panoramic camera, which pans from side to side to provide a wide sweep for each picture, used for high-altitude photography up to approximately 35,000 ft. Data is processed and stored on a recording and annotation system.

## **AC-130U Spooky**

**Brief:** A four-engine turbo-prop aircraft based on the C-130 tactical transport aircraft. The mission of the AC-130 is close, gunfire and C2 support to tactical forces on the ground. In addition to being heavily armed, the AC-130U carries a full airborne command post with extensive communication suites.

**Function:** EO/IR, FMV

**Operator:** USAF Special Operations Command

**Unit Location:** Hurlburt AFB, FL

**Performance:** Ten hours on station, unrefueled.



## **TCPED Architecture**

Spooky is able to downlink FMV to ROVER and is capable of relaying an FMV signal from more forward assets back to the situation commander.

## **EO-5 (ARL-M/C)**

**Brief:** A four-engine turbo-prop reconnaissance aircraft employed as a “low profile” asset to provide intelligence and situational awareness to field commanders and national-level consumers. The EO-5 uses the DASH-7 airframe painted in innocuous colors with minimal national markings.



**Function:** EO/IR, FMV, SAR

**Operator:** USFK, USSOUTHCOM

**Unit Location:** 204<sup>th</sup> MI Battalion, Ft. Hood, TX

**Performance:** Missions are typically seven and a half hours, but the aircraft can be configured for longer orbits.

## **TCPED Architecture**

EO/IR systems can direct downlink to ROVER for immediate use by local authorities. SAR data is reported in NRT direct to battalion-level or higher organizations.

## **US Navy P-3C AIP Orion**

**Brief:** A four-engine turbo-prop patrol and reconnaissance platform dedicated primarily to fleet support.

**Function:** EO/IR, FMV

**Operator:** US Navy, COMPATRECON Wings

**Inventory:** 60+

**Unit Locations:** NAS Jacksonville, FL, NAS Brunswick, ME, NAS Whidbey Island, WA.

**Performance:** Time on station eight – ten hours



## **TCPED Architecture**

Typical Time on Station approximately 8 hrs

Direct downlink of FMV to ROVER or TCDL.

If no downlink, crew will process/exploit data at home station ~ 1-2 days

**Note:** The P-3 is the only Title 10 platform directly tasked in the DSCA EXORD to provide rapid response.



### **U-2 Dragon Lady**

**Brief:** Single-seat, single-engine, high-altitude endurance reconnaissance aircraft carrying a wide variety of sensors and cameras, providing continuous day or night, high-altitude, all-weather area surveillance.

**Function:** High-altitude reconnaissance. EO/IR, SAR

**Operator:** ACC

**Inventory:** 34

**Unit Location:** 9<sup>th</sup> Reconnaissance Wing, Beale AFB, CA

**Ceiling:** above 70,000 ft.

**Performance:** Speed 475 mph; range more than 4,500 miles; max endurance 10+ hr.

#### **Commentary**

The U-2 is the Air Force's premier high-altitude reconnaissance platform, capable of carrying multi-intelligence sensors simultaneously, making it USAF's only truly operational multi-intelligence platform and a key asset during combat operations. In 1992, all existing U-2s were consolidated under the designation U-2R.

Conversion to the S model configuration began in October 1994.

Sensor upgrades include the ASARS-2A Synthetic Aperture Radar sensor, which provides enhanced imaging modes and improves geo-location accuracy; the SYERS-2 EO imagery system providing DOD's only multi-spectral and IR capability. New data links enable the U-2R to connect in near real-time with network-centric hubs as well as line-of-sight ground stations, airborne data relays, and beyond-line-of-sight satellite data relays simultaneously.

### **TCPED Architecture**

EO/IR systems can direct link to Air Force ground sites and DCGS. Wet film (OBC) must be processed and digitized on the ground. Dissemination can occur within minutes via email or web portal postings once processing is complete.



### **MQ-1 Predator**

**Brief:** A medium-altitude, long-endurance unmanned aerial vehicle (UAV),

**Function:** Reconnaissance, EO/IR, SAR, FMV

**Operator:** ACC; AFSOC; ANG.

**Unit Location:** Creech AFB, Nev.

**Performance:** Cruise speed 80 mph, up to 138 mph, endurance 24 hr (460 miles with 16 hr on station).

### **Commentary**

Operated currently by ACC's 11th, 15th, and 17th RSs, AFSOC's 3rd SOS, and ANG's 163rd RW, the Predator UAV has evolved into a vital component of USAF's war-fighting inventory. A Predator system includes four air vehicles, a ground control station, satellite link, and about 55 personnel for 24-hour operations. Predator crew includes a pilot, sensor operator, and several other support personnel. It carries a sensor ball that provides a laser target designator with EO/IR sensors in a single package. The SAR must be removed to make room for some of the laser designator equipment. The MQ-1 can be controlled via direct line of sight or via satellite from a remote location. Currently, most Predator missions are controlled remotely from the US.



## **RQ-7 Shadow**

**Brief:** The Shadow is a single-engine, prop-driven UAV employed as a brigade-level, intelligence asset

**Function:** EO/IR, FMV

**Operator:** US Army

**Inventory:** 200+

**Unit Location:** CONUS operational units include: 1<sup>st</sup> Cavalry Div., Ft. Hood, TX, 29<sup>th</sup> Infantry Div., Ft. Belvoir, VA, and 82<sup>nd</sup> Airborne Div., Ft. Bragg, NC.

**Performance:** Endurance varies with models, but typical missions are 5-7 hours.

## **TCPED Architecture**

FMV can be directly downlinked to ROVER or TCDL for immediate use by local authorities.



### **MQ-9 Reaper**

**Brief:** A medium-to-high altitude, long-endurance UAV.

**Function:** Reconnaissance, EO/IR, SAR, FMV

**Operator:** ACC

**Inventory:** Eight

**Unit Location:** Creech AFB, Nev.

**Performance:** cruise speed 172 mph, up to 230 mph, endurance 14+ hours.

### **Commentary**

The typical MQ-9 system consists of several aircraft, a ground control station, communications equipment/links, spares, and active duty and/or contractor personnel. The crew is one pilot and one sensor operator. The aircraft is flown from within the ground control station using either a C-band line-of-sight data link or a Ku-band beyond-line-of-sight data link. The sensor is capable of very fine resolution in both spotlight and strip modes. The SAR also has ground moving target indicator capability.



### **RQ-4 Global Hawk**

**Brief:** A high-altitude, long-range, long-endurance UAV

**Function:** Reconnaissance, EO/IR stills, SAR

**Operator:** ACC

**Inventory:** Eleven

**Unit Location:** Beale AFB, CA

**Ceiling:** 65,000+ ft.

**Performance:** Objective endurance up to 40 hr (RQ-4B 33 hr) at a cruise speed of 400 mph and at an altitude of 65,000 ft allowing on-station loiter up to 1,380 miles from base for 24 hr.

### **Commentary**

The RQ-4A is high-altitude endurance UAV carrying a 1,900-lb payload, incorporating EO/IR and SAR sensors that permit switching between radar, IR, and visible wavelengths as required. The Global Hawk system operates in conjunction with its ground launch recovery element and mission control element for command and control. The RQ-4B system increases payload capacity to 3,000 lbs for future sensors/capabilities, including signals collection and electronics intelligence. Navigation is by GPS/INS. Global Hawk flies autonomously from takeoff to landing, providing near real-time imagery products for tactical and theater commanders. Vehicle ground track and mission plan can be updated in real-time to respond to changing air traffic control and/or mission collection needs. Global Hawk provides continuous, all-weather, day/night, wide-area surveillance.



### **RQ-5A Hunter**

**Brief:** Joint Tactical UAV designed to provide both ground and maritime forces with near-real-time imagery intelligence within a 200-km direct radius of action, extendable to 300+ km by using another *Hunter as an airborne link relay*.

**Function:** FMV, EO/IR stills

**Operator:** U.S. Army

**Inventory:** 4

**Unit Location:** 297<sup>th</sup> MI Bn UET, 15<sup>th</sup> MI Bn, Ft Hood, TX , 1<sup>st</sup> MI Bn, Wiesbaden, GE , 224<sup>th</sup> MI Bn, Ft Stewart, GA

**Ceiling:** 15,000

**Performance:** 11.6 hrs of endurance with max loiter speeds of 106kts and a combat radius of 144nm.

**Commentary:** A Remote Video Terminal (RVT) is used at tactical operations centers to receive and display real-time video and telemetry from the airborne vehicle. The RVT is connected to a directional antenna to receive signals from the air vehicle flying up to a range of 40km from the terminal. The RVT can alternatively be connected directly to the Ground Control Station. The RQ-5A Hunter is to be phased out starting this FY10. It will not be replaced unless the Army convince Congress to give them Warriors (Army Predator B).





### **RQ-8 FIRE SCOUT**

**Brief:** The first LRIP (Low-Rate Initial Production) contract for Fire Scout was awarded in May 2001, and the first production-representative RQ-8A flew in May 2002. The blades can be folded for compact stowage of the UAV.

**Function:** FMV, EO/IR stills

**Operator:** Navy

**Inventory:** 4

**Unit Location:** NAS Patuxent River MD

**Ceiling:** 20,000ft

**Performance:** 6+ hours of flight endurance with max speeds of 137 mph and a combat radius of 150nm. They typically operate at an altitude between 5000-10,000ft.

**Commentary:** The FIRE SCOUT is designed to supplement the RQ-7 Shadow with its armed capability and is envisioned to eventually replace the RQ-7 for Brigade Combat Team operations. The Army and the Navy are engaging in a joint acquisition program for this assets but the Army currently does not have any operational systems. Currently, this system is in operational testing. The Army's version will be the RQ-8B and will have a significantly increased range and payload.



### **RQ-11 Raven**

**Brief:** The UAV is small and can be transported easily in three small cases that fit into a rucksack. The crew can bring it with them and operate wherever the patrol goes. The Raven has three different cameras that attach to the nose of the plane: an electrical optical camera that sends data either through a nose camera or a side camera, a video camera in the nose, and a side-mounted IR camera. The IR technology is still too big to fit into the nose section of the plane. The camera does not have a zoom and is unable to lock on a target but provides enough resolution to show someone carrying a weapon.

**Function:** FMV, EO/IR stills

**Operator:** Army, Air Force

**Inventory:** 3000 (planned)/1500 operational

**Unit Location:** Ravens are organic to Army organizations from company level and higher

**Performance:** 60 minutes of flight endurance with max loiter speeds of 60 mph and a combat radius of 6.2nm. They typically operate at an altitude between 100-1000ft.

**Commentary:** Although it is not a broad area coverage system, it is very effective at imaging point targets as well as having a very small operational foot print.



## **Title 32 IAA Capabilities**

Title 32 IAA assets are operationally controlled by each State. States utilize organic assets or request assets from other States via Emergency Management Assistance Compact (EMAC) or through the National Guard Bureau. AFNORTH does not have direct tasking authority of these assets, but maintains close coordination and visibility through direct interaction and liaison.



## **C-130 (Scathe View)**

### **C-130 Scathe View Characteristics**

**Brief:** A containerized IAA system carried aboard specially configured, four-engine, turbo prop, C-130 tactical transport platforms.

**Function:** Reconnaissance, EO/IR stills, SAR, FMV

**Operator:** Nevada ANG (TAG)

**Inventory:** Eight aircraft, Five modular systems.

**Unit Location:** 152 IS, Reno NV

**TCPED Architecture:** NRT downlink to 152 IS or forward deployed analysts. Can process / Exploit FMV and stills w/in one day (target set dependent) and disseminate within minutes (web, e-mail), upload to GBS Rover multi-band data link capability. Sensor/Link: 60-80 nm

**Commentary:** Scatheview has a KU Band Satellite uplink similar in capability to the Predator which makes it a very desirable FMV asset.

## **RC-26 (ANG)**

**Brief:** Twin-engine turbo prop Fairchild SA-227 Metro 23 conversion containing a Guard specific reconnaissance package. The RC-26 is employed both overseas and within CONUS for a variety of missions.

**Function:** EO/IR stills, FMV (not all airframes are capable)

**Operator:** ANG (various states)

**Inventory:** Eleven

**Unit Location:** 147FW Houston, TX, 144FW Fresno, CA, 125FW Jacksonville, FL, 174FW Syracuse, NY, 141ARW Spokane, WA, 162FW Tucson, AZ, 115FW Madison, WI, 187FW Montgomery, AL, 150FW Kirtland AFB, NM, 186ARW Meridian, MS, 130AW Clarksburg, WV.

## **Capabilities**

Max speed 248 KTAS

Operating alt 25k-30k feet AGL

Total flight time 5-6 hrs

Multiple Basing Location, ANG (Eleven Airframes)



## **Sensor Capabilities (EO, IR, FMV)**

Color Daylight TV zoom to approx. 50x

Color Daylight Spotter Scope 960mm lens allows Daylight TV magnification to approx 100x

Thermal Imager 3-5 micron range (no thermal crossover), magnification similar to 50x

Daylight TV

KS-87 framing cameras used for low-altitude images (3,000 ft)

Sensor Resolution NIIRs 4-5

NIIRs 6 @4500Ft AGL

## **TCPED Architecture**

Transit from FOB ~1-2 hrs

Time on Station ~3 hrs

Return to base ~1-2 hrs

Download data tapes ~1.5 hrs

Process / Exploit / Digitize

- At FOB (if avail) ~3 days or transit to home station ~6-24 hrs

- At home station ~3 days

Disseminate ~minutes (web, email)

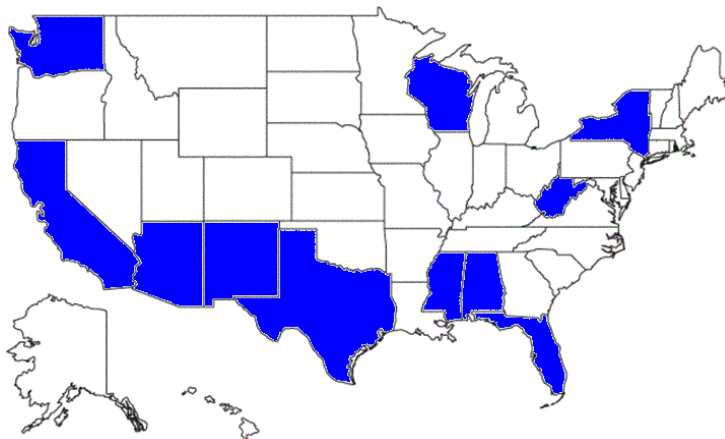
Avg # of targets per mission: 25-50

Rover Data Link Capable

LEA Capable Comm Suite

RC-26 utilized a platform specific Datalink called Dragoon to provide much higher resolution (60 frames per second) and extended tether range during FMV operations.

**Commentary:** A large number of RC-26s are typically deployed at any given time limiting the number available in the US for IAA missions.



## **E-8 Joint Surveillance Target Attack Radar System (STARS)**

**Brief:** A modified Boeing 707 equipped with a large, canoe-shaped radome mounted under the forward part of the fuselage, housing long-range, air-to-ground radar capable of locating, classifying, and tracking vehicles moving on Earth's surface out to distances in excess of 124 miles. Such data are then transmitted via data link to ground stations or other aircraft.

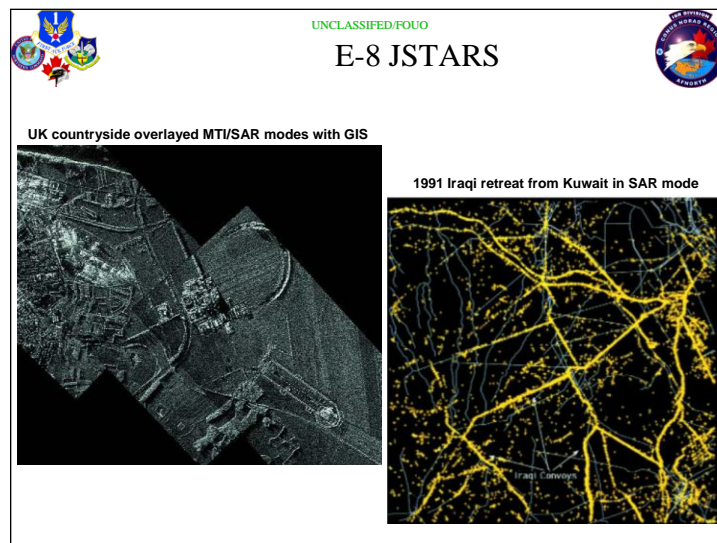
**Function:** Ground surveillance, battle management (BM), C2 aircraft

**Operator:** ACC and ANG, as the blended 116th Air Control Wing. Organized as an ANG asset

**Inventory:** 18

**Unit Location:** Robins AFB, Ga.

**TCPED Architecture:** Process/exploit Moving Target Indicator (MTI) data on-board. Disseminate in minutes via voice reporting or 24-48 hours hard/soft copy.



### **Commentary**

Joint STARS (Surveillance Target Attack Radar System) is a battle management (BM) platform capable of providing commanders with transformational C2 and near real-time wide area surveillance ultimately passing targeting information to air and ground commanders. Joint STARS battle managers use the sensor and a robust communications suite to engage enemy forces in day, night, and adverse weather conditions. The radar subsystem features multimode, side-looking, phased-array radar that provides interleaved MTI information, synthetic aperture radar (SAR) imagery, and fixed target indicator imagery. Joint STARS downlinks via a secure, jam-resistant digital data link and beyond-line-of-sight satellite radio communications. Multiple receivers are in use, predominantly the US Army's Common Ground Station and Joint Services Work Station.



## **OH-58**

**Brief:** The Bell OH-58 Kiowa is a turbine powered helicopter designed for the scout and light strike role. In National Guard service it operates with local and State law enforcement agencies as a counter-drug reconnaissance platform.

**Function:** EO/IR, FMV (not all airframes are capable)

**Operator:** National Guard

**Inventory:** 114

**Unit Location:** Located throughout the US

**TCPED Architecture:** FMV can be directly down-linked to ROVER for immediate use by local authorities.



## **Additional IAA Resources**

### **EAGLE VISION**

#### **Description**

EAGLE VISION is the DOD's only deployable, commercial imagery, ground station. The system directly receives, processes and distributes commercial imagery for use by commanders in the field. There are six EAGLE VISION systems distributed to both Active Duty and Guard components as follows:

- EG I – USAFE
- EG II – US Army, Colorado Springs
- EG III – California ANG, San Diego
- EG IV – South Carolina ANG, McEntire ANGB
- EG V – Hawaii ANG, Hickam AFB
- EV VI – Alabama ANG

Each EV unit has four to six unclassified imagery processing work stations and one classified work station. EV can process imagery for ingest into All DOD Mission Planning Systems and can produce the imagery in a variety of formats including GeoTiff, Original Commercial Imagery (OCI) format or Non-Geo Products (PDF, JPEG, etc).

#### **Architecture**

EAGLE VISION is capable of direct capture of satellite imagery from commercial sources, processing that imagery into a standard format, and utilizing satellite communications, DOT Mil, and Commercial Web services to distribute the processed imagery to users.

**Primary satellite communications are provided by:**

- AN/USC-60A Flyaway Tri-band Satellite Terminal
  - Lightweight spoke terminal with military and commercial band capability (X, C, Ku)
- Contracted ISR Capability

Additional ISR asset may be contracted out to government contractors. Initial planning considerations include a government contracted platform capable of Full Motion Video, EO, IR and SAR imagery in one single platform.

**Web access is provided by:**

- ICE NIPRNET Module:
  - Voice Switch -- DSN/Commercial access
  - Router/2 Servers -- email/Internet access

EAGLE VISION is designated as a “source” for the Global Broadcast Service, thereby providing organic and direct GBS access.

The entire EV package can be transported on two C-130's, one C-17, or a tractor trailer rig.





# Appendix IV

## Dynamic Re-Tasking Request Form



### 601 AOC SIDO DYNAMIC RETASKING REQUEST FORM

#### TO BE FILLED OUT BY REQUESTOR

1. Date and Time \_\_\_\_\_
2. Name \_\_\_\_\_ Contact Number \_\_\_\_\_
3. Agency/Company \_\_\_\_\_
3. E-mail \_\_\_\_\_
4. Location Type & Name \_\_\_\_\_
5. Coordinates (Lat/Long) \_\_\_\_\_
6. What is being looked at & why \_\_\_\_\_  
\_\_\_\_\_
7. Last time information is of value \_\_\_\_\_
8. Media type needed \_\_\_\_\_
9. Reporting Classification \_\_\_\_\_

#### TO BE FILLED OUT BY 601AOC SIDO

1. Re-tasking Number \_\_\_\_\_
2. CFACC PIR \_\_\_\_\_
3. Gain/Loss Result \_\_\_\_\_
4. EEI \_\_\_\_\_
5. Reporting Classification \_\_\_\_\_
6. Re-task time \_\_\_\_\_
7. Time on Collection Point \_\_\_\_\_

#### Approved by:

SIDO: YES NO Initials \_\_\_\_\_

CCO: YES NO Initials \_\_\_\_\_ Time \_\_\_\_\_

#### SIDO Contact Information:

DSN: 325-5785/5941

Commercial: 850 283-5785/5941

If e-mailing request – please call to confirm receipt

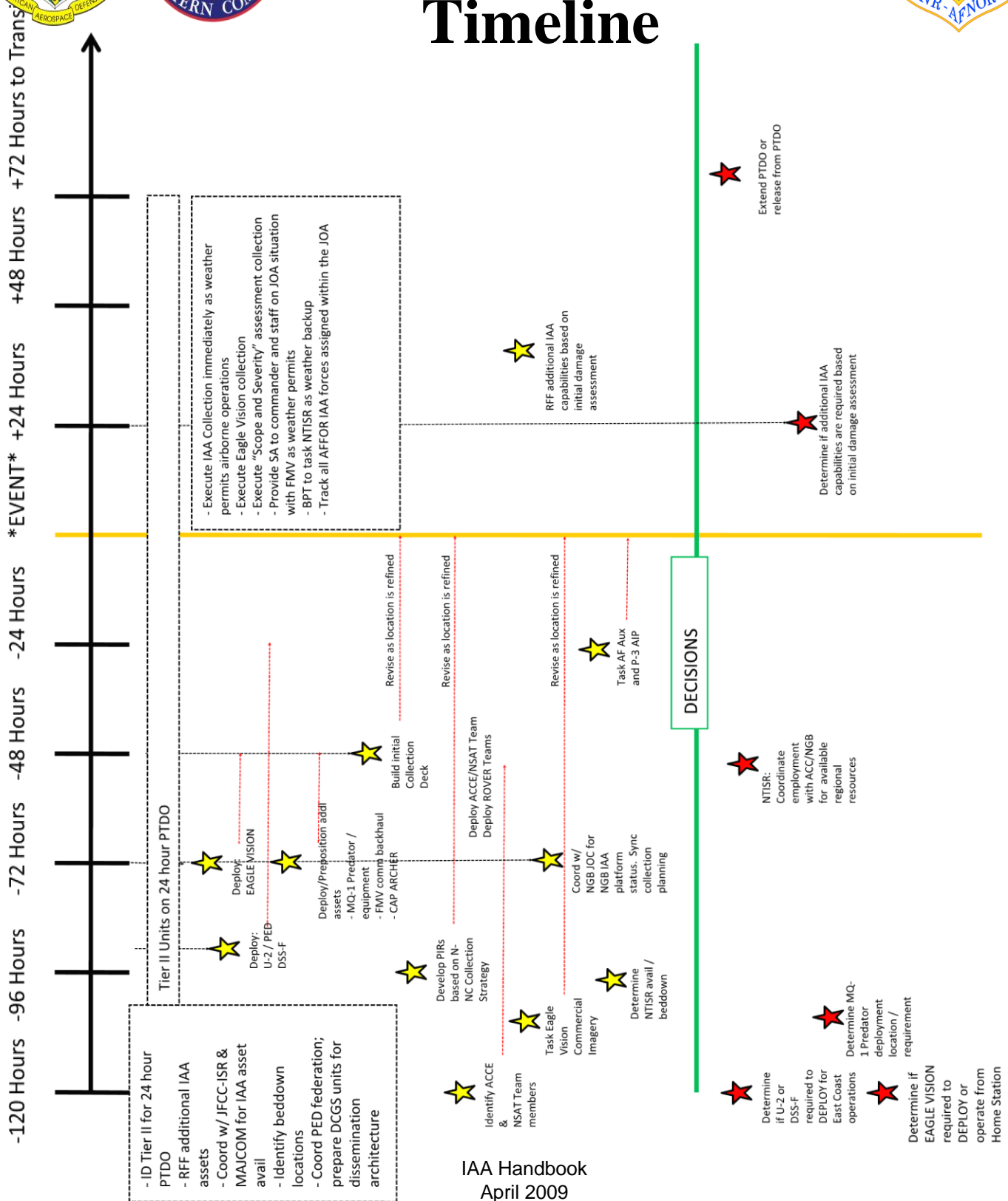
Email: NIPR: [601aocisrdsido.omb@tyndall.af.mil](mailto:601aocisrdsido.omb@tyndall.af.mil)

SIPR: [601aocisrdsidoomb@afnorth.af.smil.mil](mailto:601aocisrdsidoomb@afnorth.af.smil.mil)



# Appendix V

## Decision Support Timeline



# Points of Contact

## **AFNORTH/A2**

DSN 523-3785

Commercial (850) 283-3785

[AFNORTH.A2OMB@tyndall.af.mil](mailto:AFNORTH.A2OMB@tyndall.af.mil)

## **AFNORTH/A2X**

DSN 523-0897

Commercial (850) 283-0897

[AFNORTH.A2OMB@tyndall.af.mil](mailto:AFNORTH.A2OMB@tyndall.af.mil)

## **AFNORTH/BACKSHOP**

DSN 523-4436

Commercial (850) 283-4436

[AFNORTH.A2OMB@tyndall.af.mil](mailto:AFNORTH.A2OMB@tyndall.af.mil)

## **AFNORTH CAT A2 (Contingency only)**

DSN 523-5967

Commercial (850) 283-5967

[AFNORTH.CATOMB@tyndall.af.mil](mailto:AFNORTH.CATOMB@tyndall.af.mil)

## **601<sup>st</sup> AOC/ISR Ops**

DSN 523-5103

Commercial (850) 283-5103

[601AOC.ISROPS@tyndall.af.mil](mailto:601AOC.ISROPS@tyndall.af.mil)



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