**Emergency Operations Center**

**(EOC)**

**DESIGN WORKBOOK**

***for***

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# I. THE PURPOSE OF AN EOC.

A. Prior to any EOC design project, a clear understanding of the facility functionality is required. First consider how the space will be used and how many people will be operating in the EOC. An EOC typically operates as a facility designated for information gathering and analysis during and emergency. It is also a place where executive decisions concerning the emergency are made and where the resulting resource coordination and emergency response activities take place. Multiple rooms may be desired to segregate planning and policy efforts from operations. In addition, EOC activities include communications and dissemination of information or instructions to employees, other organizations, and the public. Appropriate communication facilities are a key component of a functional EOC.

B. A WELL DESIGNED EOC OFFERS A NUMBER OF ADVANTAGES:

1. Centralizes direction and control. A single point where all information is received and analyzed; where decisions are made, priorities established, and resources allocated.

2. Provides single point for collection, evaluation, display and dissemination of information. From information gathered at the EOC, the entire situation can be reviewed and evaluated - “What’s happened?” or “What’s about to happen?” The situation can be analyzed and response actions developed based on factual, coordinated data.

3. Facilitates verification of information. Rumors create problems until information can be verified (or communicated by an unimpeachable source). The EOC staff provides the resources and the capability to validate information, either by input from more than one source or by verification of data by field units.

4. Provides a repository of data. Unlike the situation that exists on a day-to-day basis, all parties involved in emergency operations must have immediate access to all information as quickly as possible. What transpires in one emergency response area may have significant impact on a number of emergency staff elements, even requiring complete reversal of planned actions.

5. Makes information immediately available. Information on what has happened, what’s about to happen, and what’s expected to happen are all right there in the EOC.

6. Provides a ready reference to current situation. The EOC provides a single location where the current status of an emergency situation is readily available and prominently displayed. This aids up-to-the-minute analysis of the situation, review of past actions or events, and development of possible courses of action to mitigate further destructive effects.

7. Makes maximum use of available communications. In any emergency situation, communication is the key to adequate response. The EOC must necessarily contain and make available to all elements of the emergency organization the information vital to adequate response to emergencies. Operating from a central location, the EOC makes maximum use of available information and provides a means of communication with the emergency staff on a day-to-day basis.

8. Facilitates coordination. A properly staffed EOC facilitates coordination among responding departments and agencies. Each department with an actual or potential response mission or capability must be able to coordinate activities with other participating organizations. This can be accomplished effectively only if representatives are collocated or are able to make contact with one another on a regular basis.

9. Facilitates operation over prolonged period. Disasters and emergencies do not operate on an eight-hour day or a five-day week. They often strike at the most inopportune times and frequently last for days, weeks, or even months. The EOC allows the response operation to proceed in a systematic, coordinated manner and, as sometimes occurs, allows those elements of the organization not actively engaged in the emergency operations to return to “business as usual.”

10. Provides continuity and facilitates shift change. Operating in a central location allows for shift operations, continuity of response, and close coordination among operating elements. The EOC may operate 24 hours a day for weeks on end. Only through coordinated operations in a central facility can responsive and continuous operations be ensured.

11. Provides for identification and use of available resources. Operating from an EOC, where all elements of the emergency staff are aware of problems at hand, facilitates determination of logistical requirements, helps to identify sources, and aids in the acquisition of logistical support. Frequently, one service element of the emergency organization may be in need of a particular resource (whether it be personnel, equipment, or supplies) only to find that another service element has the resource or is aware of a potential source.

12. Provides a facility to conduct meetings and training. A properly designed EOC not only provides a facility with operating space for the emergency services elements of a organization, but also provides a centralized location to conduct meetings, strategy sessions, and training.

13. Provides a facility for day-to-day operations. An established EOC can and should be the day-to-day operating location of the emergency management element recognized by the entire staff as the central focal point for all emergency responses.

# II. DETERMINING EOC LOCATION (PRIMARY AND ALTERNATE).

## A. LOCATION

The location of the EOC should be near the government’s administrative offices and other emergency services. This allows prompt response for EOC staffing. The administrative offices of the EOC management should be located in the EOC. Offices of local government officials should be nearby. Assure that all EOC team members have rapid access to the EOC. Also, identify where supplemental EOC staff resources may be called from, and if the EOC location will also allow them to respond in a timely manner. Such a location and the day-by-day use of the EOC help ensure immediate availability of key personnel and communications.

## B. SITE EVALUATION.

1. A site development plan shall be used to locate the EOC. The plan should take into consideration the following conditions and requirements:

* Natural topography and geological features.
* Existing cultural, historical and archaeological resources.
* Endemic plant and animal species.
* Health, safety and environmental protection requirements.
* Air quality impacts (e.g. contaminated outdoor air, emissions from nearby sources, soil gases, moisture and microbiological growth, improper venting, gases from indoor materials, office equipment emissions, dust and body odors.)
* Existing and planned support and service facilities including utilities, roads and parking.
* Interrelationship between facilities and aesthetic compatibility.
* Energy conservation requirements.
* Building code and zoning requirements.

2. If a risk area is identified, the EOC should be located as far from the area of highest risk. Examples include locating an EOC away from major fault lines, flood surge zones, flood plains, dam inundation zones, fire pathways, central areas subject to conflagration, avalanche paths, areas of unstable soil, hazardous material storage, downwind of hazardous gas processing and storage facilities, nuclear plants or toxic waste storage or transportation pathways, flight approach paths, and railways that transport chemicals or pressurized gas. If the location options place the EOC within a zone of the a hazard source, the Explosive Safety Quantity Distance (ESQD) arc, or within a prescribed 10 mile radius of nuclear power plants Emergency Planning zone, determine the level of mitigation that may be required in response to the hazard. Locate the EOC a safe distance from known hazardous materials.

3. For new building construction, first floor elevation should be set at 500 year flood elevation. For existing or renovated buildings, first floor elevation is recommended to be set at 500 year flood elevation and required to be set at 100 year flood elevation.

4. Identify the location of all utilities, including underground and overhead lines for electrical power, water supply, sewer, gas or petroleum lines, communications lines and towers and other utilities that may be in the planning zone.

5. Assure that the EOC is located in an area where it can be secured. Identify site perimeter, perimeter barriers and fences, control gates and other means of securing site perimeters.

6. The EOC should not be exposed to overhanging trees or forest from which wind-blown debris can strike the EOC. Debris and dust can damage the EOC or equipment essential to the EOC such as antennas and HVAC or generator motor filter systems.

7. Soil bores should be made to determine subgrade conditions that could impact EOC survivability in a disaster incident.

8. Identify where the government administration is located, and access for EOC Management personnel to the EOC.

9. Identify the location of emergency response and support services including law enforcement, fire, medical, transportation, public works and engineering support, munitions range control and other relevant support services.

10. The EOC should be located such as to allow as fast a response as possible and afford better control, easier access for EOC personnel and greater accessibility for operational forces.

11. The EOC should not be located where congestion can hinder access. It should not be contiguous to other facilities that could impair the functioning of the EOC.

12. Avoid locations that can have impaired access caused by collapsing bridges, damaged or flooded roadways, blocked rail crossings, or other man-made or natural impairments to access.

13. Locate the EOC where radio and other communication systems can operate most advantageously and have the most coverage. Locate away from radio interference such as power lines and tall metal structures.

14. Verify that the site has adequate area for the EOC building, required setbacks and parking. Determine the type of parking available (surface versus garage) and if the parking can be secured.

15. Evaluate if the site must accommodate helicopter access.

16. Identify the nearest active commercial, private and military airports, and flight paths in relationship to the EOC site.

17. The site should be easily and quickly securable in the event of an emergency. This includes not only protection of the staff and building, but protection of the communications, utility services and transportation services to the site.

## C. LOCATION WITHIN A BUILDING.

1. First consideration should be given to sub grade locations, where the EOC is protected from blast, wind-borne debris, windstorms and other hazards. Special caution should be given whenever proposed EOC locations are proposed on upper floors of structures. Access can be hindered with elevators out of commission and egress stairs compromised. Upper floors may be more susceptible to windstorm damage.

2. Verify that facilities selected for EOC use have the area to create large operations rooms and communications rooms and additional area necessary for support spaces. Verify that the facility has or can accept the infrastructure to support the protection, cabling and environmental control necessary in the EOC. Verify that the exterior envelope is or can be upgraded to the necessary protection levels for the EOC.

3. Consider possible expansion requirements when locating the EOC.

4. If the proposed facility will also be occupied by other functions, review the compatibility of those functions with the EOC. Determine if increased security, necessary for the EOC during full operations, impairs the functions of other tenants.

5. When locating EOCs in sub-grade building areas, consider sub-grade water. While designs may be contrived to withstand groundwater pressure during normal times, damage to EOC sub-grade structures can allow water under pressure from bomb or earthquake shock, liquefaction or flooding to enter into the EOC.

6. The EOC should not be located in a high-rise building or next to a high- rise building that can collapse.

## D. SITE FOR ALTERNATE EOC.

1. In addition to the primary EOC, an alternative location should also be planned in the event that the primary EOC cannot perform its function. The alternate EOC becomes the primary coordination and control point when the primary EOC is disabled. The secondary site should be prepared and capable of immediate activation, along with relocation plans for moving staff and essential items such as secure documents to the alternative site. The alternate site should be selected to minimize, to the extent possible, the degree that the major hazards impacting the primary EOC affect the alternate site.

2. Consider the relationship of the alternate EOC to the local government administrative centers and emergency services. Consider the accessibility of the site by the emergency operations team. While the alternate EOC should be at a different location to avoid both centers being disabled by the same event, access for staff from their normal duty location is an essential concern.

3. Consider placing the alternate EOC at a site served by different roadways than the primary EOC. Particular attention should be given to access routes that could be blocked by flooding, rail lines, traffic congestion, or other features that can be circumvented by the alternate site.

4. The alternate EOC should be on a separate power grid from the primary EOC.

5. Verify that the alternate EOC has adequate parking.

6. If the alternative EOC has a dual use function, determine how the resident function will be performed during an incident. Verify if the resident function will be suspended during EOC use of the alternative facility.

7. In general, criteria that applies to the primary EOC will apply to the alternate EOC.

## E. NEW VERSUS EXISTING LOCATIONS.

1. The first consideration in establishing an EOC should be the use or appropriate modification of space in an existing structure. EOCs do not need to be in stand-alone facilities and do not necessarily need to be located in a building exclusively designated for emergency operations. If the local government plans on constructing a new facility for other purposes such as administration, law enforcement, health or fire response services, consider incorporating modifications to facilitate an EOC.

2. Renovation of Existing Building Factors. The placement of an EOC facility should consider the following characteristics of an existing facility before acceptance of that facility as a location.

* Adequacy of space and ability to reconfigure space for EOC purposes.
* Structural collapse resistance or capability for upgrading structural characteristics.
* Emergency power.
* Adequate headroom clearance for all raised floor areas. Dais and raised floor areas should have a minimum of 2440 mm (8 feet) head clearance, but 3658 to 4268 mm (12 to 14 feet) is preferred to allow large displays. The raised floor must not be used as an air distribution plenum to avoid the need for plenum rated cables.

3. New Building Construction. If there is no space that is available or meets the risk factors identified for the EOC, a new structure should be considered. The EOC can be incorporated into a multipurpose military facility, or created as a stand-alone facility.

## F. SECURITY CONCEPTS.

1. Controlled Access Area. The operations area of the EOC must be designed as a controlled access area. The area must have a continuous secure perimeter. The number of egress points must be kept to the building code mandated minimum. All doors must be secure, with access control and intrusion detection.

2. Survivability. The EOC should be able to survive an emergency incident. Therefore, protection should be an integral part of planning, building (or modifying) and equipping an EOC. Securing the building and its staff against a wide variety of conditions will require close examination of its basic location, structural integrity and security procedures. Protection also means allowing for failures in equipment such as antennas and generators. All equipment should be installed with security in mind. This will require placing vulnerable equipment in more secure locations and providing extra support devices.

3. Scalable Security. Based on the Risk Analysis, provide security features commensurate with the threat severity levels faced by the facility and the level of acceptable risk. Provide capability for the EOC to increase security levels during incidents based on the threats relative to the incident. Security can be temporarily increased through additional barriers, additional surveillance and supervision and activation of protection systems such as filters that are bypassed during normal operations.

4. Restricted Areas. Identify areas within the EOC that have restricted security and communications requirements. Support and storage rooms located on the EOC perimeter that are not continuously occupied require intrusion volumetric sensors or other surveillance systems. Provide secure enclosure to all cabling and equipment associated with restricted or secure communications capabilities in the EOC.

5. Off-Site Protection. Protection cannot be limited to the EOC proper. Transportation routes should be kept open; ancillary offices used to maintain continuity of government administration should also be secure. Storage areas for vital supplies, mobile stock and vehicles should be secure. All of these facilities need to be protected. As conditions change before and during an emergency, the security systems need to be reexamined and modified. Examples include identification of road construction activity that requires alternative routes. Emergency vehicles including ambulances, police cars, fire trucks and water tankers parked in open lots may be vulnerable, rendering them unavailable for use during the emergency.

## G. ALTERNATE EOC REQUIREMENTS.

1 Alternate EOCs will normally be a secondary function of the space selected, with the space converted to EOC purposes if the primary EOC cannot function. Alternate EOCs will need to be equipped to perform the same basic capabilities as the primary EOC, but may not require a complete set of features.

2. The alternate EOC should be capable of accommodating the same security levels as the primary EOC. The alternate EOC should be capable of performing the same communications functions as the primary EOC. The alternate EOC should consider the same site selection criteria as the primary EOC.

3. A separate Risk Analysis should be performed for the alternate EOC. This assessment will determine the level of protection required for the alternate EOC, which may be different than the primary EOC location. The Risk Analysis should consider the different asset value of the alternate facility and the likelihood of the alternate location being impacted by the same incident in determining the level of protection and acceptable level of risk for the alternate location.

4. Protection of alternate EOC locations and protection of relocation activities during transition from primary to alternate EOC should be provided. The key staff and necessary items should be moved as quickly and securely as possible. A mobile unit used for relocation can enhance the security of the move. For alternate EOC sites, the security systems may be monitored from a remote position location when the alternate EOC is not activated.

5. The requirements for structural, building envelope, interior construction, mechanical systems, electrical systems, water sources, life safety, shock mounting, security and communications distribution may be adjusted to reflect the level of threat severity level and functional capability determined necessary for the alternative EOC.

# III. EOC DESIGN CONSIDERATIONS.

## A. STAFFING.

1. Determine what specific staff will report to the EOC. The EOC should be designed to accommodate these individuals and their related equipment. Additional space should be included for growth. The EOC should be sized to handle the maximum anticipated staff that would be called in the event of a major disaster.

## B. SPACE.

1. A minimum of 5 (4.64) square meters per person is required with 7.5 (7.43) square meters per person being preferable. If it provides sufficient space, an existing conference or training room may be suitable for this purpose. In selecting existing space, look for sufficient square footage and adjacency to other required facilities. These may include breakout rooms, eating facilities, emergency management offices, and photocopy and other office equipment areas.

*Important: The size and structure of the EOC will be primarily by the number of people required to carry out the EOC functions during an emergency.*

## C. CONFIGURATION.

1. As stated earlier, optimum configuration depends on the concept of operations. There are an infinite variety of EOC configurations and no two are the same. EOCs are often created with different constraints, financial resources and management priorities. To suggest any configuration is better or more efficient would be counter-productive to the entire concept of emergency management. EOC space needs to be flexible above all else.

2. Configuration priority should be given to facilitating communications. Groups or individuals should be adjacent to others that they will have regular communication with. For smaller EOCs, a board room configuration (seen here) may be suitable.

3. It may be most cost-effective to plan on using existing space for multiple purposes. A conference or training room may be well suited for use as and EOC. In this case, consideration should be given to ease of conversion. You must be able to quickly stand up the EOC. General configuration may be basically the same as the room’s normal set-up, varying only in where people sit. In most cases, staffing requirements will dictate the configuration and rearranging furniture may be required.

4. Telephone and computer equipment may require that wires be installed and stowed in a drop ceiling or under a raised floor.

## D. DISPLAYS.

1. Shared displays offer an effective means of sharing important information with everyone in the EOC. Overhead LCD projectors are the most cost effective option while large plasma screens and rear projection cubes (pictured here) are the latest and most versatile technology.

## E. INFORMATION COORDINATION.

1. Pre-determine what information and references will be maintained in the EOC. Regardless of the type of hazard that is faced, emergency managers almost always need to know:

* Where are the people?
* Where are the natural features that help or hinder response?
* Where are the institutions and human-made structures that help or hinder response?
* What transportation options are available to get the victims out and emergency services in?
* What resources are available to help with response?
* What are the environmental pathways that are likely to spread the impacts to other areas?
* Where do the organizational boundaries lie?

2. It is therefore essential to have, at a minimum, the following information:

* Employee contact lists.
* Emergency contact lists.
* Vendor contact information.
* Area maps and building plans.
* Meteorological and hydrological data.
* Inventory of available resources.

## F. FUNCTIONS OF EOC STAFF.

1. The number and function of EOC staff is a key consideration in designing the EOC space. While it is not clear at this point what staff should report to the EOC, in general one would expect the following major functions to be performed by the emergency management staff:

* Executive authority policy making (Direction and Control)
* Establishing priorities
* Information collection, evaluation, and display (Disaster Analysis)
* Coordination of resources (Operations)
* Communications/warning
* Public information (Media Center)
* Government services Liaison (Keeping track of other govt. services at the same time)

2. Factors Affecting Staff Required.

a. The emergency staff required to operate an EOC effectively during an emergency situation will depend on several factors:

* Size of the organization.
* Size of the day-to-day organizational staff.
* Nature of the emergency. The EOC can be activated at different operating levels based on circumstances.
* Percentage of the organization (number and area) involved in the disaster or emergency.
* Size of the facility selected for use as the EOC.

3. The staff will expand and contract during various phases of the emergency, with the largest commitment of personnel during the response phase. Staff office area can be designed as a mini EOC that can be used for threat monitoring and low-level activations.

4. Necessary versus Unnecessary Personnel.

a. In almost every disaster, there is a tendency toward convergence upon the EOC. Far more people appear in the EOC than are required to manage the situation. It appears to be the desire on the part of staff to “make sure we have enough people to do the job”. In addition, interested local staff personnel without assigned emergency duties or responsibilities - including elected officials, volunteers, and the curious - frequently gravitate toward the crisis center to find out what is happening or to see if they can help.

b. Staff members, actual and potential, must be advised of their roles and responsibilities in advance of an emergency, especially if their assignments involve operations in the EOC. This is usually done through a comprehensive emergency plan. These staff personnel - and only these - should be permitted access to the EOC, except in special cases when the services of additional staff become necessary due to some unforeseen circumstances. Staff responsibilities must be clearly delineated and fully understood by all personnel.

5. Important Staff Components.

a. The emergency service disciplines which must be represented in the EOC are many and varied. In addition, numerous administrative and support elements must be present in the EOC to provide direct support to elements of staff responsible for response and recovery functions.

b. Consider:

* Executive Group
* Disaster Analysis
* Resource Coordinators
* Communications
* Operations Supervisor
* PIO
* Security
* Administrative Support
* Government and Business Liaison

## G. BASIC CONCEPTS OF EOC CONFIGURATION.

1. The EOC, the nerve of the organization during emergency operations, may take on many configurations. The layout may be standard, used in a like manner in all emergencies, or it may vary based on response to the specific event. The configuration or layout of the EOC will be determined by several factors:

* Size and shape of the room or rooms selected as the organizational EOC.
* Size of the crisis management team.
* Location of the supporting communications system.
* Experience gained through activation and operations either in actual disaster or during exercises.

2. It is important to recognize that the layout or configuration will change not just once, but several times over the years. As experience is gained during exercise or disaster operations, a particular layout or procedure may be proved inefficient or even invalid. The emergency manager must be aware of this possibility and not attempt to defend the current configuration or retain the status quo. Flexibility should be the key.

3. A floor plan or drawing must be developed depicting the basic layout; arrangement of furniture, a location of displays/maps, and the communications arrangement within the EOC. This floor plan, once it has proved adequate, should become a part of the EOC standard operating procedures.

4. Different disasters (both in size and type) may require modified EOC layouts. Different stages of a disaster may also require modifications in the arrangement of the EOC, reflecting changes in the size and composition of the crisis management staff as the emergency escalates or phases down.

5. As previously indicated, the preferences of the emergency management coordinator and members of the EOC staff will influence the final configuration. The optimum layout or configuration can be determined only through exercises or operations during actual emergencies. During periods when the EOC is in actual operation, shortcomings and deficiencies will become apparent. It is not uncommon for it to take several activations of the EOC over a period of several years to determine just what the best configuration really is.

6. Despite the many variables and possible idiosyncrasies of the coordinator and/or the staff, several general principles should be considered in developing the EOC layout:

* The manager should be in a position from which to stay abreast of the current situation and manage the operation. To some this may mean a position in the main operations room, with connecting communications and appropriate displays.
* Staff elements whose emergency response functions interface continually, are interdependent, or are in direct support should be co-located.
* EOC staff sections should be located adjacent to displays pertaining to their activity. This allows for ease of posting and ready reference.
* Staff sections operating through their own communications networks must either be located near the source of their communications or have the capability to remove the system to their location in the EOC.

7. These are some of the basic principles to consider. Keep in mind that there are others equally important, some over which you will have absolutely no control. However, you may have the opportunity or capability to do something about some other factors.

8. Problem Areas.

a. One of the areas that will present a major challenge is that of the noise level within the EOC. Noise above tolerable levels will seriously impede the efficiency and effectiveness of the EOC staff. Various noise abatement designs may limit EOC noise.

b. Crowding is another problem. Everyone wants to “get in on the act”. Many EOC staff personnel or service chiefs feel more comfortable with additional personnel close by. Some organizational staff personnel with no emergency assignments desire to be involved in the action to see if they can help. This is highly commendable but cannot be tolerated and must be controlled rigorously. Only those individuals required to perform emergency response functions during that particular phase of the emergency should be allowed in the EOC. This may prove difficult to enforce and will require firm policy direction from the chief administrative office or director.

## H. EOC RECOMMENDATIONS.

1. EOC design considerations include a wide array of issues. This section discusses these considerations in detail and provides recommendations that are based on best practices and federal standards. The key consideration areas are: survivability, flexibility, communications, and redundancy.

2. Survivability.

The EOC must be constructed in an area free from as many hazards as possible. Building designs that exceed the standard building code should be considered. We recommend locating the EOC within the core of the building to add additional protection. In case the EOC itself is impacted by events, an alternate EOC should be identified as well.

3. Flexibility and Open Architecture.

EOCs should be designed and built to be the primary facility for 50 years or longer. Case studies show that organizations have quickly (within several years) outgrown their facility either in general space or technology. A new EOC must have maximum flexibility for configuring it to meet the varied needs of different disasters and to accommodate future growth in responsibility or technology. A multi-purpose room with raised flooring and open architecture systems will allow expansion as well as the use of future technologies.

4. Communications.

Information fuels EOC operations. Communications requires multiple lines of communications, and multiple redundant systems to include: telephone, radio, amateur radio, satellite-based communications, TV and other media information. The EOC should be closely linked to communications centers and other EOCs via robust communications systems. Information sharing and display options should be automated to support the transition from a low level emergency to a full-blown disaster with the necessary documentation.

5. Redundancy.

Redundancy is the key to survivability and communications. When it comes to cost cutting, redundant systems will often be the first targets; this is to be avoided if possible. Having diversity in technology and communication paths will help to eliminate disruptions occurring just when the systems are needed most. Manual tools are also recommended in case power or technology fails during the event.

## I. FACILITY DESIGN NEEDS.

1. The following lists describe elements of effective EOCs and provide a list of design considerations based on our experience and federal guidelines.

2. Outside Areas.

* Office parking, general parking, emergency parking (this is a recurring shortfall).
* Vehicle barriers at entrances, transformers, fueling stations, etc.
* Covered outside break areas for smokers and general gathering place(s).
* Security lighting and security cameras.
* Protection for air intake areas from either terrorist or industrial chemical releases.
* Media hook up points with power and cable runs.
* Weather station.
* Positioning of the communications tower.

3. Technical Space.

* Audiovisual editing and monitoring space.
* Warning point equipment space.
* Message center space, for faxes, copier, distribution, satellite.
* Weather monitoring station.
* Space for GIS and plotter(s).
* Space for backup EOCs for other agencies/organizations.

4. Utilities.

* Water storage on site.
* Connections to two different distribution networks.
* Backup generator(s) that provide total service to the building.
  + - * + Size generators at 1 and 1/2 the expected capacity to allow for growth.
        + One generator capable of running the critical functions of the building.
* Site pre-wired to hook up a third mobile generator.
* Computer monitoring of the facility by remote control.
* A dedicated facilities person to operate and maintain the facility.
* Separate room controls for HVAC.
* HVAC sized for maximum occupancy as opposed to normal occupancy.

5. Communications.

* Phone system with touch screen, user friendly - one at each pod, ops area.
* PBX that supports phone forwarding.
* Multiple routing of telephone lines to different switches.
* Radio tower with direct connectivity (as opposed to remotely located antennas.)
* Additional analog lines.
* T1 (or greater) data service to the building.
* Radio room for amateur communications and public safety communications.
* Radios in each breakout room to correspond to functions.
* Set up antenna jacks in break out rooms with antennas in place for radios for participating agencies.

6. Security Area.

* A main entrance that controls public access and contains intruders (man trap).
* Protection for the receptionist/security person.
* Communications at that point with the rest of the building.
* Ability to use PA system to page.
* Access control system that allows persons with access to move directly into the building.
* A control system that allows security to track who entered and left the building by time (such as proximity card system).
* Increasing levels of security for sensitive areas of the building, utilities, computers, dispatch.

7. General Administrative Space.

* Dual use space throughout the facility.
* Cubicles designed to take two - four people in emergencies.
* Low rise walls.
* Good signage - EOC signage different and very clear including directional signs.
* Building directory.
* Extra phone and electrical jacks for EOC expansion.

8. Operations Room.

* High ceilings.
* Large projection displays (rear projection).
* Large screen TVs (32-36").
* Use indirect lighting with dimmers. (Note that fluorescent Lamps can produce radio frequency interference.)
* Track/spot lighting along walls with three-circuit capability.
* Provide sound attenuation.
* Audio visual control point.
* Remotely controlled camera.
* Raised flooring with multiple outlets for electricity and data.
* Coffee bar near the EOC, water fountain in the room.
* Tackable wall surface.
* Access to multiple TV channels (use infrared system with mobile headsets for selecting audio channels).
* Lots of white boards mounted on walls.
* Egan Wall System/portable white boards.

9. Breakout Rooms.

* Multiple breakout rooms.
* Some divided by soft walls.
* Egan Wall System.
* Put white boards as panels on walls.
* Small pull down screen in each room.
* Built in storage in each room.
* Radio communications in each room.
* TV/monitors (32-36") in each room.
* Tackable wall surface.

10. Media Room.

* Live feed from the Coordination Room.
* Telecommunications hookups for the media.
* TV/Computer monitor.
* Ability to tape briefings either video or audio.

11. Storage.

* Lots of storage.
* Secure storage for electronic equipment.
* Storage for training materials, public education materials, and equipment.
* Storage areas incorporated into conference rooms and breakout rooms.
* Large credenzas provide storage and work surface.

12. Restrooms/Shower & Locker Rooms.

* Restrooms sized for the maximum number of people present during operations.
* Full size lockers.
* Separate showers for men and women.
* Multiple shower stalls with private dressing area.
* Restrooms in two different areas of the facility.

13. Support Areas.

* Kitchen with refrigerator, microwave, dishwasher, stove/oven, plumbed coffee maker.
* Eating and serving area.
* Wide hallways, eight feet on main corridors and minimum of six feet elsewhere.
* Bulletin boards.
* Bunking area wired as future office space if needed.
* Exercise room.
* Quiet rooms.
* Utility closet with stationary tub.
* Non structural mitigation throughout.
* Furnishings need to be part of the facility and identified up front.
* Make conduit cable runs 2 to 3 times what is anticipated for future growth.
* Large multipurpose room with dividers - Access from outside - Full kitchen for serving.
* Teleconference capability.

14. Common Mistakes to Avoid.

* Lack of storage area.
* Eliminated bunking.
* Failed to raise flooring.
* Not enough conference room space.
* Not enough parking.
* Outgrown facility by time it’s constructed.
* Rigidly adhering to normal space planning guidelines.
* Inadequate lighting controls.
* Work cubicles too small.
* Too few communications and electrical outlets; no radio tower.
* Restrooms/showers/lockers too small.
* Lack of complete kitchens and dining area too small.
* Setting an arbitrary square footage limit.

## J. FACILITY DESIGN ATTRIBUTES.

1. Location.

* Use results from a Hazard Vulnerability Analysis (HVA) in determining the location and design of EOC: Locate the EOC in an area that minimizes potential hazard impacts to the facility. Evaluate all hazards that may impact the EOC. Consider:
  + - * Protection from WMD.
      * Protection from groundwater (for any part of EOC below ground).
      * Nearby hazards, e.g. structures, that could collapse onto EOC.

2. Access to EOC.

* Good access by roads.
* Public notification signage (small signs providing direction to EOC).
* Access roads should be passable under all situations if possible.
* Access roads elevated.
* Good connections from primary roadway systems.
* Sufficient clearance on underpasses for large vehicles.
* Site entry: primary and secondary.

3. Parking Lots.

* Designated for EOC only; restricted to individuals using EOC.
* Parking lot and site security.

4. External Structure.

* Built to (or in excess of) current building codes and regulations.
* Design features to withstand local natural hazards e.g. earthquake, strong winds, tornadoes, hurricanes, etc. (see HVA).
* Lightning Protection.
* WMD protection; Secure against terrorist assault.
* Accessible to the physically handicapped.
* Windows: able to withstand hurricane force winds; block UV light.

5. Internal Structure.

* Ensure the following are built to or in excess of code: partitions; floors, walls, ceiling treatments or electrical wiring, panels, batteries, and plumbing.
* Fire protection systems: automatic fire suppression (sprinklers); fire fighting equipment; smoke detectors/fire alarms (audible and visual). FM 200 type system in data centers.

6. Plumbing.

* Ensure ability to shut off / close off from outside utility system. (Ability to secure and protect in case of contamination).
* Consider a "closed" system.
* Include a holding tank.
* Disposal adequate for extended operations. (Estimates of human waste production range from 45 to 170 Liters per day [12 to 45 gallons] per day.)
* Toilet areas ventilated to outside and not recirculated through EOC.
* Vents must be secure and protected.
* If located below ground, ensure an adequate sump pump system and check valves.

7. Garbage System.

* Garbage storage facilities (in case required collection services are interrupted, suspended.)
* Storage areas ventilated, not recirculated into EOC. (Vents: secure and protected).
* Trash compactor.

8. Emergency Water Equipment and Storage System.

* Independent 14-day water supply is advisable (well, storage tank, or cistern.)
* Water supply considerations include:
  + Potable water for drinking, food preparation, hand washing, medical/first aid. (A minimum of 10 gallons of water per day per person is recommended.)
  + Additional water required for flush-type toilets. (25 gallons of water per person per day.) Consider chemical toilets.
  + Additional water required for showers and waste disposal systems.
* Additional water required for mechanical equipment (e.g. cooling water for auxiliary power systems, mechanical cooling systems, firefighting equipment.)

9. Ventilation System.

* An adequate and safe air supply is important. Sufficient fresh air is required for EOC staff health and for mental alertness. Considerations include:
  + - * + System should supply not less than 0.4 cubic meters per minute of fresh air per person to the occupied space, of which at least 0.14 cubic meters per minute is outside air. (This is sufficient to supply the necessary oxygen for breathing and to purge the air of carbon dioxide produced by breathing.)
        + A HEPA (high efficiency particulate arrestor) pleated filter capable of filtering 99.97% of particulates 0.3 um in size should be used.
        + Locate the air intake remote (some distance away) from the exhaust.
        + Ensure air intake and exhaust is secure and protected (WMD).
        + Adequate for long term operations.
        + Adequate heating system with backup heating.
        + Adequate air conditioning system with backup.
        + Independent temperature control within EOC rooms.

10. Auxiliary Lighting System.

* Emergency battery operated lights with trickle chargers placed in stairwells, corridors, restrooms, etc.
* Emergency lighting for EOC operations rooms.

11. Auxiliary Power System.

* Generator size, type of fuel, fuel tank size: Sufficient capacity to furnish the necessary power to maintain the EOC fully operational 24 hours per day for a minimum of 14 days.
* Auxiliary power system sized to provide for the maximum demand loads of the EOC. Loads connected to generator should include: communications, computer, lights, ventilation, air conditioning, heating, sump, and kitchen.
* Location of generator and fuel supply: ensure protection from all hazards.
* Ensure generator exhaust system not a threat to EOC.

12. Security.

* Secure against terrorist assault.
* Use keys or combination locks.
* Ventilation / exhaust openings protected (e.g. steel grates).
* Smoke & heat detectors.
* Fire containment for important rooms (machine rooms).
* Fire extinguishers.
* No smoking policy near computer equipment.
* Fireproof containers for computer media.
* Guards at critical entrances (main gate, all building entrances).
* Authentication of employees (ID badge check).
* Burglar alarms.
* Surveillance equipment.
* Escorts for visitors.
* Personnel Security.
  + Background checks.
  + Periodic/random updates.
  + Vendor agreements to check their employees.
  + Public security policy (in writing, easily available).
  + Train employees to watch for suspicious activity.
  + Train supervisors to watch for possible employee problems.
  + Established security audit procedures.
  + Precautions against fired/leaving employees.
  + Explicit restrictions on resource usage.
  + Careful distribution of keys/accounts/privileges.
* Communication.
  + - * + Password control.
        + One-time password or challenge response.
        + Tiger team password cracking.
        + Encryption of channels.
        + Protecting network cabling (eavesdropping, denial of service).
        + Shielding (electro-magnetic interference).
        + Firewalls.
* Operations Security.
  + - * + Unpredictable security checks.
        + Identify critical/targeted data.
        + Established procedures for dealing with computer crime
        + Established response team.
        + Practice drills for response team.
        + Policy for handling sensitive/confidential/trade-secret data.
        + Spot checks of trash.
        + Spot checks for online and available data.

13. Ease of Use by Disabled.

* Adhere to the "Americans with Disabilities Act."
* Internal structure must meet the minimum standards for access and use by people with physical disabilities. (Special attention to such architectural design components as vehicular traffic routes, interior traffic routes, protruding objects, ground and floor surfaces, curbs and ramps, stairs, elevators, doors, drinking fountains, light switches, toilet facilities, kitchen and dining facilities, handrails, grab bars, alarms, telephones and accommodations.)

14. Space Requirements, design attributes.

* Minimum of 5 to 8 square meters per EOC staff member assigned to the EOC in an emergency on a sustained 24-hour basis
* Head room of 8 feet (or greater) recommended

15. EOC Layout / Floor plan, design attributes.

* Layout by functions to be performed. Consider space for such functional areas as: operations; planning; logistics; administration/finance; communications; policy/executive group; briefing room; press room.

16. General Guidelines.

* Layout should provide for minimum interference between operating and support areas (such as eating, sleeping, mechanical equipment, health and sanitary facilities).
* Arrange operational areas (including the Operations Rooms, communications and message centers, and executive office space) to provide maximum efficiency in the interchange of essential information.
* Locate EOC staff sections adjacent to the displays pertaining to their activity to allow for ease of posting and ready reference.
* Position functional groups with adequate spacing between them to minimize noise levels.
* Locate staff groups and agencies near their communications.
* Provide for storage of work supplies and personal belongings.

17. Communication and Warning Equipment.

* Equipment often becomes inoperative due to lack of power or damaged components.
* Ensure mitigation measures to protect these systems against hazards.
* Ensure outside radio antennas are secured.

18. Display Equipment.

* Visual displays offer an excellent means for sharing information quickly and efficiently. Displays should permit immediate access to intended users by sight without interruption.
* The least expensive and most flexible display media, charts, and maps (either magnetic or plastic overlay), are easy to store, use, and relocate if necessary. The disadvantage of this medium should be considered in developing EOC information systems. Wall charts may become difficult to keep current in the hectic early activity of EOC operations when data they are designed to display are most needed. Wall charts are also easily obstructed by normal traffic in the EOC. When a chart is filled, it must be erased, thus losing data on early problems and responses, unless procedures are developed to record it before erasing (such as with instant-print camera).
* Overhead projectors offer a simple, inexpensive method of displaying important information. Viewgraphs or transparencies (plastic sheets) used with the projector can be saved or reproduced on a copy machine for record, thus avoiding loss of valuable information as operations proceed.
* Computer applications provide excellent storage, display and printing capabilities; they can store emergency plans, SOPs, checklists, resource files, and alert lists and can produce reports and public information releases. Additionally, computers offer the greatest flexibility in providing information to satellite offices in the EOC, such as the Coordinator’s office. Computers must have a reliable power source, independent of the commercial power source, and must be tested for operability on alternate power- sources.
* Computer Displays:

Should be free from disturbing glare and reflections.

There should be appropriate contrast between the screen and its background.

Natural light should be avoided.

Adjustable coverings should be provided for any windows.

* Displays should include:
  + EOC layout and organization.
  + Message flow.
  + Major Events.
  + Problem log.
  + Damage Assessment.
  + Maps.
  + Hazard / Risk Maps.
  + Weather.
  + Resource status.
  + Signs for functional sections, groups, units.
  + Signs for staff positions.

19. Furnishings, Furniture, Office Equipment, and Supplies.

* Furnishings should be light and support mobility. It may be necessary to re-configure the EOC during an event. Bulky, heavy, cumbersome equipment/supplies will hinder, rather than help.
* Provide adequate desks, tables, and chairs.
* Provide adequate work surfaces for maps, support equipment, etc.
* Office Equipment and Supplies (see EOC Equipment / Supplies Checklist).

Spare parts and tools on hand for equipment.

Maintenance schedules for equipment.

Supplies for a minimum of 14 days are maintained and rotated.

20. Sanitary Facilities, Equipment, Supplies.

* Sanitary facilities will be necessary to maintain the EOC for extended periods. Facilities, equipment, supplies sufficient to meet needs for 14 days. Consider:
  + Toilets.
  + Showers.
  + Laundry Facilities.
  + Garbage Disposal.
  + Backup sanitation kits and plenty of extra supplies such as toilet paper; supplies maintained and rotated.
* Vendors.

21. Food and Water Supply.

* Water Supply:
  + Minimum supply of 38 Liters of water per day per person.
  + Alternate sources of water; Arrangements to ensure availability in an emergency.
  + Additional supplies to satisfy mechanical and other requirements for water.
  + Water available for showers, waste disposal systems, firefighting equipment, etc.
  + Emergency bottled water available for drinking and cooking.
* Food Supply.
  + Food stocks for 14 days per person.
  + Avoid sugar-laden and fat-filled foods such as hot dogs, hamburgers, candy bars, donuts, and pastries. Sugar can cause irritability, hyperactivity, and depression. Fats cannot provide the fuel that emergency personnel need to handle intense activity levels. More suitable foods include plain granola bars, fresh and dried fruits, milk, hard cheeses, whole-grain breads, crackers, and fresh vegetables.
  + Avoid overuse of caffeine and sugar-laden beverages; alcoholic beverages should not be available.
  + System to rotate food supplies.

22. Kitchen Equipment, Supplies.

* What and how much will depend upon the type of food supplies stored and the preparation needs. Consider:
  + EOC cooking facilities?
* Minimum capability:
  + Coffee urns, pots, other hot drink capability.
  + Hot plates.
  + Microwave oven.
  + Refrigerator.
* Paper plates, cups, bowels, plastic utensils.

23. Sleeping Accommodations.

* Some type of sleeping arrangements should be available to accommodate at least half of the EOC staff. Two or three tier bunks can be used to conserve space. Sleeping bags and portable beddings should be readily available. Consider:
  + Sleeping accommodations sufficient for the emergency staff (recommended facilities so that 50% of EOC staff can sleep / rest at one time).
  + Resting facilities located in a quiet location.
  + Lockers for personal clothing, equipment, hygiene supplies (recommended 0.1 cubic meters per person).

24. Medical Equipment, Supplies.

* See Attachment 1 “EOC Equipment / Supplies Checklist" for more information.
* There should be at some first-aid capability. Ensure that EOC staff trained in first aid procedures.
* Equipment and supplies sufficient amounts to meet needs for 14 days
* First aid kits with extra supplies of bandages and antiseptics should include medicines to treat diarrhea, headaches, constipation, and some respiratory problems.
* Consider having a medical professional assigned to the EOC.

25. Janitorial Services, Supplies.

* Supplies to properly store and dispose of trash.
* Ensure provision for janitorial service during EOC operations.

26. Maintenance and Spare Parts.

* Tools and spare parts for the physical plant: lighting, communications, ventilation, heating, auxiliary power, plumbing, etc.
* Lubricants for equipment as applicable.
* Ensure procedures in place to maintain support systems and equipment.
* Ensure inspections and maintenance schedules.
* Ensure a database tracking system for inspections and maintenance schedules.
* Data base includes:
  + Description of equipment, including model number, serial number and manufacturer.
  + Vendor(s) name, address, and phone number.
  + Contract number and account information.
  + Date equipment was purchased or leased.
  + Last scheduled inspection/maintenance.
  + Next scheduled inspection/maintenance.
  + Expiration date of contracts.
* Special Equipment, Clothing, design attributes:
  + Breathing apparatus and protective clothing for hazmat spills, toxic gas leaks, etc. available for EOC staff.
  + Cold weather clothing (if heating fails) available for EOC staff.
  + Other special equipment or clothing needs.
  + Ability to deal with future technologies and design attributes.
* Use of EOC Space.
  + Length of time required to activate physical facility (Federal guidelines recommend 30 minutes).
  + Ensure checklists are posted to rapidly convert to EOC.
  + Ensure regular exercises to practice converting to EOC use.
* Lightning.
  + Proper grounding and protection.
* Environment.
  + Temp control (AC).
  + Humidity control.
  + Separate AC for computer rooms.
  + Alarms on temp/humidity control equipment.
  + Air filters.
* Electricity.
  + Clean electricity supply.
  + Uninterruptible Power Supply.
  + Anti-static carpet.

# IV. TECHNOLOGY REQUIREMENTS FOR AN EOC.

## A. TECHNOLOGY.

1. An EOC exists to receive information, process it, display it, and then coordinate response and recovery activities based upon the analysis of what has occurred.

2. There is a direct link between the efficiencies of communications, processing of information and the speed and accurateness of the analysis needed to determine response activities. Information displays are the key factor in allowing EOC members to visually assimilate and process information in order to make sense of chaotic maelstrom type of events. Physically plotting information on map displays is perhaps the best way in which to spatially give individuals the tools in which to form their mental picture of unfolding events.

3. Information sharing between individuals and EOC sections is what coordination is all about. The communications, information routing and displays need to support this primary function.

4. The audiovisual system needs to support the assumption that perhaps only 25% of the people responding to an EOC in a catastrophic event will have ever functioned using the equipment. It is also assumed that systems that require continuous use in order to maintain proficiency will be in the minority. Systems experts like Geographical Information System (GIS) Technicians or Computer Aided Design (CAD) System Operators will be needed to run these more sophisticated systems.

5. Technology must be used to make complex operations simple for the average person. Systems need to be able to be operated intuitively by people unfamiliar with their basic functions. Instructional periods for people to become functional (note: not proficient) in operating equipment needs to be measured in minutes not hours.

## B. SYSTEM REQUIREMENTS.

1. Flexibility is one of the primary criteria for the facility as a whole. This is especially true as it relates to the audiovisual system. Forecasting a minimum of a 40-year life span for an EOC facility means that it must accommodate a number of revolutions in technology. As communications, automation, and audiovisual systems continue to merge in form and function, their future needs must be considered. The basic facility environment needs to support the visual display of information via television monitors, large screen projection systems and more conventional wall display systems. Lighting controls and wall space design is a critical part of this functional element.

2. People and functions throughout the building must be able to access information that is available in other portions of the facility. This may be either just audio (as in briefings) or the visual display of information. Use of the Internet as a source of information during disasters can only be expected to grow, so computer access to outside networks needs to be robust and redundant.

3. Information must be able to be moved and shared throughout the facility. Telecommunications links must exist that allow information to be transmitted to other remote sites like other EOCs or perhaps a federal Disaster Field Office. Internet connectivity must be considered paramount.

4. While technology is important, a combination of high tech and low-tech systems is needed in the facility. As stated earlier there will be a wide range of system skills available. There must be some lowest common denominator systems that everyone can relate to and interact with.

5. Automation systems must serve the processing of information and not impede or disrupt the rapid flow of critical news and event information. Systems must support the primary function of information sharing and coordination and not detract from these processes.

6. Access to local and national media outlets (both radio and television) is necessary. This information is needed to feed a rapid impact assessment process that is designed to determine what events are unfolding and their impact on people, organizations and the community as a whole.

7. The news media are a true partner in providing information to the public about disasters and what action is being taken to counter the negative impacts of disasters. Space for the media should be considered. The goal is to keep them out of the EOC but to provide them with the information they need to convey an accurate picture of events to their customers. Their access into the facility and system information needs to be controlled. This is done to ensure that unconfirmed information or brainstorming types of information is not available to them. On both the exterior and interior of the facility they need an appropriate visual backdrop that conveys their presence at a government facility that is serving and responding to the public’s needs. Permanent, in place, microwave or fiber optic connections to the media will allow for a rapid flow of information from the EOC and a Joint Information Center (JIC) to the media.

# V. CONCEPT OF OPERATIONS RECOMMENDATIONS.

## A. EMERGENCY SUPPORT FUNCTIONS (ESFS).

1. A jurisdiction’s "Comprehensive Emergency Management Plan" should consider use of ESFs rather than functional annexes. ESFs are the current “best practices” and facilitate coordination between the various levels of government during emergency operations.

2. ESFs represent groupings of types of response or assistance activities that are likely to be needed in times of emergency or disaster. The National Response Plan is organized by ESFs, and most government Comprehensive Emergency Management Plans are now organized by ESFs as well. During emergencies EOCs determine which ESFs/functional divisions are activated to meet the disaster response needs.

3. County, state, and federal governments will respond to requests for assistance through the ESF structure. Within city, District and Provincial EOCs, requests for assistance are tasked to the particular ESFs for completion. A lead agency/department for each ESF is indicated, and is responsible for coordinating the delivery of that ESF to the emergency area. The lead agency/department will be responsible for identifying the resources within the ESF that will accomplish the mission, and will coordinate the resource delivery.

4. A jurisdiction’s Comprehensive Emergency Management Plan should be based upon the concept that the emergency functions for the various departments and organizations involved in emergency operations will generally parallel their normal day to day functions. To the extent possible, the same personnel and material resources will be employed in both cases. The day to day functions that do not contribute directly to the emergency operations may be suspended for the duration of the emergency. The efforts that would normally be required for those functions will be redirected to the accomplishment of emergency tasks by the departments concerned.

5. Example ESF Schedule.

ESF # l: Transportation

ESF # 2: Communications

ESF # 3: Public Works & Engineering

ESF # 4: Fire Fighting

ESF # 5: Information & Planning

ESF # 6: Mass Care (General Public)

ESF # 7: Resource Support

ESF # 8: Health

ESF # 9: Search & Rescue

ESF # 10: Hazardous Materials

ESF # 11: Food & Water

ESF # 12: Energy

ESF # 13: Military Support

ESF # 14: Public Information

ESF # 15: Volunteers & Donations

ESF # 16: Law Enforcement & Security

ESF # 17: Animal Protection

ESF # 18: Special Medical Needs

ESF # 19: Business & Tourism Assessment

ESF # 20: Disaster & Life Safety Assessment.

ESF # 21: Damage Assessment

ESF # 22: Emergency Medical Services

ESF # 23: Employees Assistance & Deployment

ESF # 24: Public Protection (Warning, Evacuation, Shelter)

ESF # 25: Administrative & Finance

ESF # 26: Fatality Management

ESF # 27: Evacuation Traffic Management

ESF # 28: Debris Management

ESF # 29: Information Technology Services

ESF # 30: Safety Risk Management

## B. CRISIS MONITORING, CRISIS ACTION TEAM.

1. The EOC should provide a 24-hour designated contact or warning point. This may either be a skeletal crew that maintains readiness, capability, record keeping and communications or, if 24 hour staff is not available, communications forwarded to a designated point of contact. When an incident arises, the facility should be designed to allow staff levels to be expanded rapidly in appropriate response to the incident.

2. Consider use of a Crisis Action Team (CAT) to facilitate crisis monitoring and crisis decision making. A CAT is used to facilitate the process of evaluation and incident planning, and possible activation and implementation of emergency functions and resources. The CAT is a flexible, supporting/coordinating service that could be used as needed. The CAT would be composed of members from various departments and organizations considered essential to facilitate the process of evaluation and incident planning, and possible activation and implementation of emergency functions and resources. The CAT will be the initial responders to the EOC during emergency operations, and will make the determination if members of the EOC Management Team should be activated. The CAT can also be used to support Incident Commanders in field situations. Any department or organization could be called upon to provide a representative to the CAT. Exactly who is called and ultimately how many people will serve on the CAT is dependent upon the situation and the functions that will be activated.

## C. DEVELOPMENT OF EOC OPERATIONAL PROCEDURES.

EOC Operational Procedures should include the following procedures:

1. EOC Activation Procedure.

2. Alerting and Notification, to include EOC Staff Alert and Notification Roster.

3. EOC Setup.

4. Use and Types of Incident Status Boards.

5. Security: Entrance, Egress, and Sign-in.

6. Activation Levels - EOC Staffing.

7. Communication Systems and Operating Procedures.

8. Computer Systems and Operating Procedures.

9. Operational Period Duties.

10. Briefing Procedures:

* Initial Activation Briefing.
* Start of Shift Briefings.
* End of Shift Briefings.
* Shift Changeover Briefing.
* Briefings for visitors or special subjects/situations.
* Media Briefings.
* “Heads-up” Briefing.
* Briefings for the Executive.

11. Incident Action Planning.

12. EOC Support, Equipment/Supplies.

13. Message/Information Flow.

14. Situation Reports.

15. After Action Reports and Critiques.

16. Deactivation.

17. Personnel Accountability.

18. Records Maintenance.

## D. EOC ORGANIZATION.

1. The National Incident Management System (NIMS) provides an incident command structure (ICS) which is a method for organizing an EOC. Within the ICS, emergency support functions are established which focus on specific areas of responsibility.

2. Consider the following additions to the "ICS" EOC organization:

a. Executive Group. The Executive Group develops policy and strategy, disseminates policy guidance and direction through the EOC Director, provides interface to the media and public, and liaison with state and federal officials as required.

b. A “Legal Officer” function who:

* • Provides legal analysis of the emergency management program.
* • Reviews existing plans and procedures.
* • Provides legal advice.

c. A Crisis Action Team (CAT). Members can be integrated into the EOC organization or retained as a separate unit. The CAT will recommend policy guidance and direction to the EOC Director.

d. An EOC Support Branch to include the following Units: Administrative Support; Maintenance; Security.

e. EOC Communications Branch.

## E. CONCEPTS OF EOC CONFIGURATION.

1. The EOC may take on many configurations. The layout may be standard, used in a like manner in all emergencies, or it may vary based on response to the specific event. The configuration or layout of the EOC will be determined by several factors:

* Concept of Operations.
* Size and shape of the room or rooms used as the EOC.
* Size of the crisis management team.
* Location of the supporting communications system.
* Experience gained through EOC use in actual disasters or during exercises.

2. It is important to recognize that the layout or configuration will change not just once, but several times over the years. As experience is gained during exercise or disaster operations, a particular layout or procedure may be proved inefficient or even invalid. A floor plan or drawing must be developed depicting the basic layout; arrangement of furniture, a location of displays/maps, and the communications arrangement within the EOC. This floor plan, once it has proved adequate, should become a part of the EOC standard operating procedures.

3. Different disasters (both in size and type) may require modified EOC layouts. Different stages of a disaster may also require modifications in the arrangement of the EOC, reflecting changes in the size and composition of the crisis management staff as the emergency escalates or phases down.

4. As previously indicated, the preferences of the emergency coordinator and members of the EOC staff will influence the final configuration. The optimum layout or configuration can be determined only through exercises or operations during actual emergencies. During periods when the EOC is in actual operation, shortcomings and deficiencies will become apparent. It is not uncommon for it to take several activations of the EOC over a period of several years to determine just what the best configuration really is.

5. Despite the many variables, several general principles should be considered in developing the EOC layout:

* The coordinator should be in a position from which to stay abreast of the current situation and manage the operation. This may mean a position in the main operations room, with connecting communications and appropriate displays.
* Staff elements whose emergency response functions interface continually, are interdependent, or are in direct support should be collocated.
* EOC staff sections should be located adjacent to displays pertaining to their activity. This allows for ease of posting and ready reference.
* Staff sections operating through their own communications networks must either be located near the source of their communications or have the capability to remove the system to their location in the EOC.

## F. COLOR CODING.

Consider “color coding” the EOC to facilitate the ease of identifying the various functions within the EOC. Each section in the EOC Organizational Chart can be assigned a color. This concept can be continued in the EOC facility. Position signs can identify the position and be in the same color as depicted the EOC Organizational Chart. The staff could have vests, hats, or name tags with the same color. Color coding provides a quick visual reference and assists with organizing the different sections.

## G. EOC STAFFING.

1. In almost every disaster, there is a tendency toward convergence upon the EOC. Far more people appear in the EOC than are required to manage the situation. It appears to be the desire on the part of staff to “make sure we have enough people to do the job.” In addition, interested local staff personnel, without assigned emergency duties or responsibilities, may attempt to report to the EOC. This may include board members, volunteers, and the curious – individuals who frequently gravitate toward the EOC to find out what is happening or to see if they can help.

2. Staff members, actual and potential, must be advised of their roles and responsibilities in an emergency, especially if their assignments involve operations in the EOC. This is usually done through the emergency plan. These staff personnel - and only these - should be permitted access to the EOC, except in special cases when the services of additional staff become necessary due to some unforeseen circumstances. Staff roles and responsibilities must be clearly delineated and fully understood by all personnel.

3. The Comprehensive Emergency Management Plan and its concept of operations should clearly describe who is to report to the EOC. The staff can expand and contract during various phases of the emergency.

## H. EOC STAFF POSITION CHECKLISTS.

Develop a complete EOC Operations Manual, complete with detailed checklists for each EOC staff position. Content for each EOC staff position SOP should include:

1. Position.

2. Who the Position Reports To.

3. EOC Positions Managed by this Position.

4. Job Description.

5. General Tasks (pre-emergency).

6. Initial Actions (EOC activation).

• General.

• Specific.

7. Continuing Actions.

8. Shift Change.

9. Demobilization:

• General.

• Specific.

10. References.

11. Authorities.

## I. EOC STAFF: HEALTH, SAFETY AND WELFARE PROCEDURES.

Staff Health, Safety and Welfare Procedures should include the following procedures:

1. Emergency Power.

2. Medical Emergencies.

3. Medications.

4. Stress and Anxiety.

5. Personal Supplies.

6. Psychological Concerns.

7. Deactivation Considerations (Mental Health).

## J. INFORMATION/MESSAGE FLOW.

1. There are four basic types of messages that are found in the EOC:

• Inquiries asking for information.

• Advisories providing information or resources.

• Requests asking for resources or policy decisions.

• Orders directing resources or activities.

2. One of the greatest areas for confusion and inefficiency during actual operations under emergency conditions is the inability to capture control of the information flow. When messages come into the operations center, where do they go, and how is the action taken on those messages tracked? Management of this flow is absolutely necessary for accurate status and analysis of the present situation.

3. A great deal of this problem can be solved in the establishment of an efficient message form and routing schedule.

4. EOC Data Requirements:

* Alert Lists. Names, addresses, and day and night telephone numbers of members of the EOC staff, cooperating agencies, and nearby organizations.
* Hazard Information. Maps of risk areas, flood zones, landslide- prone areas; maps of the community with locations of hospitals, schools, nuclear reactors, hazardous materials storage areas, and other critical facilities identified (including address, day and night contact procedures).
* Mutual Aid. Lists of nearby organizations with day and night telephone numbers and communication links, names of contact persons, and types of resources available.
* Agency Lists. List of local, state, and federal agencies with day and night telephone numbers and communication links.
* Staging Areas. Lists of predestinated, multipurpose staging areas with addresses, day and night phone numbers, and resources available (fuel, maintenance facilities, food, sleeping capacities).
* Warning and Public Information. Procedures for receiving warnings and for activating local warning systems.
* Media. Lists of radio, print, and television media with contact numbers. Prepared advisory information for major disasters, especially shelter and medical facility locations, and health and safety precautions.
* Damage Assessment. Procedures for activating damage assessment teams with lists of personnel assigned to teams, with day and night contact points.
* Law Enforcement. Police and security equipment, personnel, facilities, and supplies in or near the area; private security companies with personnel and equipment information, address and telephone number(s).
* Fire. Fire station locations and communications with personnel, equipment, and supply information; lists of private or public owners of pumps, compressors, and other supplies.
* Public Works. Locations and communications with public and private equipment yards and multi-purpose staging areas; day and night phone numbers and addresses of supply and equipment vendors, heavy equipment contractors, and fuel suppliers; maps of utility systems, station and substation locations, and communications.
* Medical. Lists of medical facilities, capacities, and communications links; lists of secondary medical facilities with locations and contact procedures; lists of medical supply houses with contracts; lists of pre-designated temporary first aid stations.
* Transportation. Lists of transportation resources, including public and private agencies with vehicle fleets. Specifically identify those with radio capacity.
* Communications. Lists of citizens band (CB) and amateur (HAM) radio clubs or individuals with frequencies, assignments, contact procedures; lists of government and commercial radio networks with frequencies, assignments and contact arrangements.
* Supplies. Lists of supplies of bulk fuel, foods, and specialized equipment and supplies (sandbags, lighting, generators, pumps, respirators) with day and night contact numbers.
* Congregate Care. Lists of shelters, capacities, stocks, and designated managers. Lists of other facilities with organizations designated to operate them, and contact procedures.

# V. CONCLUSION.

EOC designs are typically based on the organization’s concept of operations. A sound concept of operations is required to support an effective decision making process that will help a jurisdiction’s management function effectively during emergencies. This report can be used to support the best configuration and equipment for an EOC.

# ATTACHMENTS

## Attachment 1: EOC EQUIPMENT AND SUPPLY CONSIDERATIONS

1. Auxiliary Power.

* Generators.
* Uninterrupted power systems.
* Surge protection

2. Mechanical.

* Lighting.
* Backup systems, equipment.
* Flashlights, batteries, bulbs.

3. Communications.

* Phones.
* Cell phones.
* Radios (inter-personnel and inter-agency).
* Commercial radios.
* TV cable and satellite connections.

4. Displays.

* Maps.
* Charts/displays.
* White boards, chalk boards, or electronic boards
* Bulletin boards.
* Easels with flipcharts/pads.
* Monitors, projectors, etc.

5. Furniture.

* Tables/chairs.
* Desks.
* Clocks.

6. Office Equipment (Electric).

* Computers.
* Photocopiers.
* Extension cords.
* Surge protectors.

7. Record Keeping.

* Recording system and equipment.
* Cameras.
* Message forms.
* Logs.
* Time tracking software.

8. Documents.

* Plans:
  + - * + Extra copies of key operations plans.
* SOPs.
* Resource staffing lists.
* Library of reference materials:
  + - * + Phone Books.
        + Resource Lists.

9. Supplies.

* Pencils, pens.
* Printer Paper.
* Printer toner.
* Writing pads.
* Paper clips.
* Tape.
* Push pins.
* Staplers/staples.
* Scissors.
* Name tags.
* Folders.
* Boxes.
* Clipboards.
* Binders.
  + - * + In a COVID-19 environment, this may include signs and posters reminding staff to adhere to social distancing.

10. First Aid Facility, Supplies.

* Food service.
* Kitchen, dining space.
* Can openers.
* Coffee.

11. Sanitary, Hygiene Facilities.

* Toilets, supplies.
* Showers.
* Sanitation kits: chemical disinfectants, commode seats, etc.
  + - * + Additional COVID-19-related items may include:
* Thermometers.
* Hand sanitizer.
* Testing kits.
* Gloves, face masks/shields, and other necessary PPE.
* Additional cleaning supplies/disinfectant to sanitize all communal equipment and spaces.

12. Garbage, Trash Supplies.

* Brooms.
* Sponges.
* Mops.
* Buckets, Pails.
* Other cleaning supplies.
* Trash cans.
* Shovels.

## Attachment 2: INTERNAL OPERATIONAL AREA DESIGN/LAYOUTS

The EOC should be physically arranged to permit close, continuous coordination and immediate, positive action by all responsible or impacted groups.

Operations Suite. The core area of the EOC should be identified as the operations suite. It should be arranged as an enclave and designed as a controlled access area.

Types of Spaces. The following list of spaces identify areas that may occur in an EOC, though many of these spaces may not be required in smaller EOC facilities:

A. SECURITY AND RECEPTION AREAS.

* Entrapment Area or Room
* Reception Desk

B. OPERATIONS SUITE.

* Operations Room
* Executive/Policy Rooms
* Conference Rooms
* Briefing Rooms
* Data & Telecommunications Equipment Room
* Senior Management Staff Rooms
* Information and Planning Rooms
* Communications Center
* GIS/Mapping

C. ADMINISTRATIVE OFFICES.

* EOC Director or Emergency Management Director
* Deputy Director
* Communications Director
* Public Affairs or Information Officer
* Administrative Assistant
* Legal Counsel
* Duty Officer or Operations Section Chief

D. SUPPORT SPACES.

* Copier/fax machine room
* Storage
* Emergency Generator
* Optional Sleeping Quarters or a Quiet Area
* Optional Food Service or Break Area

E. ADJACENCY REQUIREMENTS.

1. The EOC will consist of an operations suite with a main operations room from which direction and control is exercised. All spaces that directly support that function during an emergency incident should be located directly adjacent to the operations room within the operations suite. Often, related operations spaces exist, such as communications rooms or rooms for detailed analysis of resource management, continuity of operations and other issues. These should also be located in the operations suite. The EOC will also include office spaces for staff who work out of the EOC, which also should have access to the operations suite area. All spaces that have working relationships with the operations room should be located inside the controlled access area. Other support spaces such as sleeping areas will be located in adjacent zones, though not in the controlled access area. The support spaces should not interfere with the primary operations in the operations suite. General planning guidelines include:

• The layout should provide a minimum of interference between operating and support areas such as eating, sleeping, mechanical equipment and sanitary facilities.

• The operations suite (including operations room, communications and message centers and executive offices) should be arranged to provide maximum efficiency in the interchange of essential information.

• Necessary provisions should be made for storage, though such use of space should be carefully planned.

• When possible, furniture and equipment should be moveable to allow reconfiguration of the space and conversion of space functions to suit the situation and staff level required for the specific incident. When flexible layouts are used, layout information should be posted and response staff trained on how to quickly implement the appropriate EOC layout.

2. The following relationship diagram is intended to illustrate general relationship requirements, and not to denote a mandatory configuration. The size, composition and existing site constrains of individual EOCs may vary considerably necessitating variations in layouts to achieve desired functional relationship of the spaces.



3. Security and Reception Areas. The EOC requires control of personnel entering the EOC Operations Room or the EOC Operations Suite. This may include an entrapment area or room, and a reception desk area.

4. Entrapment area. If the Risk Analysis indicates that entrance security necessitates an entrapment area, this should be located prior to the reception desk. The entrapment type entry area or room provides control access in and out of the EOC, allow for verification of identity before admittance, allow for summoning of escort for visitors, and provide for delay of forced entries. The public should be able to access the outside entrance door to the entrapment area and be admitted to the entrapment area through communication with the receptionist or via automated access control. A second secure door should be provided for access from the entrapment area or room into the EOC once the individuals requesting entrance have been cleared to enter. The entrapment area should allow communications with the reception area either through a secure window or through an intercom and camera system. The entrapment area should be equipped with a secure locker for storage of items not permitted in the EOC. If the need for a metal detector for entrance screening is indicated by the Risk Analysis, accommodations for a metal detector system should be incorporated into the entrapment area. Additional strengthening and protection of the entrance may be required if indicated by the threat severity level and level of protection from the Risk Analysis.

5. Reception Desk. This position should be located directly adjacent to the entrance from the entrapment area and be capable of communicating with individuals in the entrapment area (if one is provided) and individuals outside the EOC requesting entrance into the EOC or entrapment area. The receptionist requires a desk, and preferably a transaction height counter of 1066 mm (42 inches) for conducting identification and badge issuing business with individuals. If indicated by the threat severity level and level of protection of the Risk Analysis, the receptionist may have an attack and ballistic resistant window overlooking the entrapment area.

6. Operations Room. The operations room is the nerve center of the entire EOC. It is a large meeting area designed to facilitate operational decision making. It should be centrally located in the EOC. Extensive presentation, communication and data processing aids for key personnel are maintained in the operations room.

a. Provide a designated plan for the seating arrangement or location of key members of the emergency operations team designed around the “concept of operations” which will determine who should sit together.

b. The operations room will generally be arranged with key coordinating staff and decision makers located on a dais in front of the space, with supporting emergency personnel located in groups spaced throughout the operations room.

c. The operations room should have displays visible to all participants. Displays may use rear projection, front projection or flat panel display systems. Flat panel displays could be plasma or LCD technology. The displays should also have teleconferencing capability. Each display should be able to have video feed from a variety of sources, including staff computers, DVD/VCR players, public news broadcasts, and teleconferencing systems. Each console station for staff should have a minimum of 1 telephone and 1 data communication connections, and possible radio connections. Provide public address capability for each position, possibly through the phone system, as well as connections to the communications and command conference spaces.

d. The following illustrations show four general configuration alternatives for the operations room. The total number of stations required in the operations room will be a function of the number of staff required to be present. Note that there is no one right way to configure spaces. The best configuration will depend on the concept of operations and the space available. It is important that the chosen configuration allows people to see shared displays and speak to the people that they need to interact with.

• The first alternative shows positions clustered in rows. This arrangement creates working group teams of different specialists. This provides basic organization when there are many participants of different specialties which can be clustered into related teams.

• The second alternative shows the positions arrayed in rows facing a primary display screen and director positions. This allows all members of the team to be focused on a common issue, each providing their own related input.

• The third alternative is an advancement of the team arrangement, arraying the working group teams in “V” configurations that allow a lead position to address each group. This configuration also orients the working groups towards a front display and directory dais area.

• The fourth alternative can best be described as standard conference arrangement, with all team members seated around a large conference table. This arrangement is best used with only relatively small groups, where everyone needs to focus on a common discussion. This is appropriate for small EOC operations or policy groups of larger EOC operations. The orientation of the displays to the moderator and the command positions requires consideration.

Operations Room with staff in “teams” of console positions.







Operations Room with staff in “V” teams of console positions oriented towards visual display systems.



Operations Room with staff in conference arrangement with positions around a large table.