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DAR ES SALAAM REGION

# **Emergency Operations Center Handbook for DarMAERT**

**JUNE 2020**



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**June 2020**

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# 1. Introduction

The Training, Exercises, and Drills (TED) program for the Dar es Salaam Multi-Agency Emergency Response Team (DarMAERT) was made possible through a partnership by the Government of Tanzania, the United Kingdom Department for International Development (DFID), the World Bank, Earthquakes and Megacities Initiative (EMI), and Ardhi University (ARU). It was designed to support the emergency management pillar of the Tanzania Urban Resilience Program (TURP).

It was in September of 2018, that the EMI-ARU team conducted a Capacity Needs Assessment (CNA) with key DarMAERT leaders and stakeholders to solicit the latter's perspectives critical to the design of the TED. Since then up to the completion of this document in May 2020, the EMI-ARU team continued coordination with DarMAERT for the co-design of the different TED activities, all of which were instrumental to the crafting of this document.

This *EOC Handbook* is a deliverable to the World Bank to support the following requirement under the Emergency Management pillar of the Tanzania Urban Resilience Program (TURP): “to propose the structure of the Emergency Operations Center (EOC) and the protocols for its operation and management.”

The development process for the *EOC Handbook* was underpinned by a philosophy of Human-Centered Design, in which DarMAERT members provided critical inputs, context, and recommendations pertaining to the evolution of this product. Annex 1 shows the history of DarMAERT's EOC Co-Design Inputs through the TED Program. The *EOC Handbook* was further shaped by a Design Thinking process throughout a series of iterative and iterative “building blocks” of Trainings, Exercises, and Drills. As described below, the thought process behind the findings and recommendations of the EOC Handbook with the Design Thinking process of *Empathize*, *Define*, *Ideate*, and *Prototype* were tested in TED Module 4—which culminated in a catastrophic cyclone and flood-oriented Functional Exercise for DarMAERT delivered in March 2020.

The analysis process in the formulation of the *EOC Handbook* was also aligned with international best practices<sup>1</sup>, including state-of-the-art practices from the United States' Federal Emergency Management Agency (FEMA), which were used to analyze the EOC along the following characteristics: Facility Features, Survivability, Security, Sustainability, Interoperability, and Flexibility. The business process that governed the EOC were also baselined against state-of-the-art FEMA documentation that leveraged another international emergency management standard—the Incident Command System (ICS). While these processes were primarily documented in a companion product under the TED program, the *Standard Operating Procedures Handbook*, the lens of the

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<sup>1</sup> This includes examples in Metro Manila, Philippines as well as Dhaka, Bangladesh as well as Mumbai, India, as well as additional examples from the Middle East/North Africa (MENA) region as well as Sub Saharan Africa.

“Planning P” concept under ICS<sup>2</sup> was a further methodology to interpret the physical space requirements of the DarMAERT EOC.

After an intensive development and co-design process with DarMAERT, which included four Training Modules, four Tabletop Exercises and three Drills, this *EOC Handbook* was tested in Module 4 with its capstone Functional Exercise. During this development process, DarMAERT was able to formulate and describe its vision to retrofit and augment its current space at the Ilala Fire Station, and provided critical inputs to the prototype rendering of the proposed spacing as well as to equipment and personnel recommendations. A copy of this design rendering is provided in Figure 1 below and described in greater depth within this document. It is noted, however, that adjustments in this design rendering will be likely in the future, as the World Bank, Government of Tanzania and DarMAERT pursue new Information, Communication and Technology (ICT) or other investments in the DarMAERT EOC.

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<sup>2</sup> The “Planning P” is a concept derived from the Incident Command System (ICS), and used frequently in EOC Activations as an international best practice. The Planning P represents processes and steps involved in planning for an incident. The leg of “P” describes initial response actions and EOC Activation. The top of “P” represents the first operational Planning Period, with a circular sequence of meetings, planning, briefings, and the creation of a new operational period. The Planning P is the “clock” from which EOC activations are structured.



*Figure 1. Proposed DarMAERT EOC re-design.*

## The Emergency Operations Center in Context

### 1.1. What is an EOC

An Emergency Operations Center (EOC) is the *physical space in which Emergency Response operations occur*. In the context of the United States, of which some aspects are being adopted as an international best practice, an EOC is:

*the physical location at which the coordination of information and resources to support incident management (on-scene operations) activities normally takes place. An EOC may be a temporary facility or may be located in a more central or permanently established facility, perhaps at a higher level of organization within a jurisdiction. EOCs may be organized by major functional disciplines.*



The major functional disciplines are known in the DarMAERT context as “Emergency Response Functions” or ERFs (e.g., fire, law enforcement, medical services), by jurisdiction (e.g., National, Regional, Municipal, Ward), or by some combination thereof.<sup>3</sup>

Designing an EOC to be tailored to the required Emergency Management functions of a given jurisdiction can take one of three forms:

1. *Retrofitting EOCs from Existing Building Space* – redesigning a current space, often a component of a building, to assume the necessary functions of an EOC during an activation event. This is the chosen approach of DarMAERT.
2. *Designing and Constructing new EOCs* – a complete design, engineering, and construction project to establish a new EOC, allowing for greater flexibility to achieve standards to build capacity for an Emergency Response operation.
3. *Establishing “Control Rooms” or External Nodes for EOCs* – establishing smaller building spaces for jurisdictions including local levels of government, local communities, or Emergency Support Functions spaces to monitor front-line or specific Emergency Response information, including the deployment and tracking of specific resources.

## 1.2. EOC International Standards

EMI’s approach to international standards for EOC recommendations drew heavily from best practices from the FEMA. The FEMA approach proved compatible with the *Emergency Management Accreditation Program (EMAP<sup>4</sup>)* standards including:

- 4.5 – Prevention
- 4.6 – Operational Planning and Procedures
- 4.7 – Incident Management
- 4.8 – Resource Management and Logistics
- 4.9 – Mutual Aid
- 4.10 – Communications and Warning
- 4.12 - Facilities
- 4.13 – Training
- 4.15 – Crisis Communications, Public Education, and Information

Specifically, the EMAP Standard for Facilities asked each Emergency Management Program seeking international accreditation to assess their own internal capabilities along the following guidelines:

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<sup>3</sup> *State Emergency Operations Centers*. US Department of Homeland Security, via Data.gov. Accessed: Jan 22, 2020. <https://catalog.data.gov/dataset/state-emergency-operations-centers-eoc>

<sup>4</sup> *The Emergency Management Standard*. Emergency Management Accreditation Program (EMAP). Accessed: Mar 23, 2020. <https://emap.org/index.php/what-is-emap/the-emergency-management-standard>

4.12 - An accredited Emergency Management Program should have facilities capable of adequately supporting response and recovery activities;

4.12.1 The Emergency Management Program has a primary and alternate facility capable of coordinating and supporting sustained response and recovery operations consistent with the Emergency Management Program's risk assessment; and

4.12.2 The Emergency Management Program has established and tested procedures for activation, operation, and deactivation of primary and alternate facilities<sup>5</sup>

It was noted that FEMA Region VI based in Denton, Texas, USA is also currently EMAP-accredited. FEMA drew heavily on the *Incident Command System (ICS)* as a best practice for structuring the organization and management protocols of the EOC. Accordingly, EMI's view is that its approach to adopting FEMA products is anchored in international best practices, as EMAP and ICS are two of the international standards EMI adapts for its approach to Integrated Emergency Management Systems (IEMS).

The two FEMA Products that have been used to adapt a baseline for evaluating the DarMAERT EOC were:

- 1) FEMA Emergency Operations Center Assessment Checklist,<sup>6</sup> which provided the majority of the context for the physical recommendations for the EOC, as well as some Management and Operations protocols; and
- 2) FEMA EOC Skill Sets User Guide,<sup>7</sup> which suggested the utilization of the Incident Command System as a best practice for structuring EOC Operations.

After reviewing and adapting for the Dar es Salaam-based context, the physical characteristics of the EOC were grouped across the following categories:

#### 1. Facility Features

- The physical features of EOC facilities: e.g. sitting, structure, available space. EOC spaces are: an operations area, conference rooms, communications center, secure communications room and multi-use space. This includes multi-use space that is not

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<sup>5</sup> The Emergency Management Accreditation Program (EMAP) applies peer-reviewed, credible standards in a formal accreditation process that targets an entire Emergency Management program within a jurisdiction. The process of finalizing and updating documentation fosters continuous improvement of a holistic Emergency Management program. Emergency Management Accreditation Program. 2013. *Emergency Management Standard*. Accessed: 1/27/19.

<https://www.emap.org/index.php/root/for-programs/23-2013-emergency-management-standard/file>

<sup>6</sup> Federal Emergency Management Agency. 2015. *Emergency Operations Center Checklist*. Accessed: 7/24/2019. <https://www.fema.gov/emergency-operations-center-assessment-checklist#2>

<sup>7</sup> Federal Emergency Management Agency. 2018. *Emergency Operations Center Skillsets User Guide*. Accessed: 7/24/2019

[https://www.fema.gov/media-library-data/1523362117337-5d0c53869715a7a5f64fb6addc357e75/EOC\\_Skillsets\\_User\\_Guide.pdf](https://www.fema.gov/media-library-data/1523362117337-5d0c53869715a7a5f64fb6addc357e75/EOC_Skillsets_User_Guide.pdf)

dedicated to EOC operations but can quickly be made available to support EOC requirements for additional space during major disaster or surge situations.

## 2. Survivability

- The effects of a realized potential risk and continued operations from the EOC or a fully-capable alternate location (e.g. have an alternate EOC that can be activated and used if the primary is destroyed, damaged or not accessible) are sustained.

## 3. Security

- The EOC guards against potential risks and protect operations from the unauthorized disclosure of sensitive information (e.g., have sufficient security and structural integrity to protect the facility, its occupants and communications equipment and systems from relevant threats and hazards).

## 4. Sustainability

- There are support operations for extended durations (e.g. be able to sustain operations 24/7 during all emergency situations without interruption; to the extent practical, be located in a place that is not a high-risk area for known hazards, such as flooding and other natural hazards, nuclear power plants, hazardous material sites, etc.).

## 5. Interoperability

- The EOC shares common principles of operations and exchange routine and time-sensitive information with local jurisdictions, Emergency Support Functions, and national partners.

## 6. Flexibility

- Operations are scaled and operational pace adapted to the All Hazards event (e.g., have sufficient space, equipment, furniture, administrative supplies, and the like are available to satisfy mission requirements).

The management and operations protocols were grouped along the categories:

### 1. ICS Organization

The organization integrates elements of and aligns to Incident Command Structure including Command Staff—EOC Manager/Incident Commander, Public Information Officer, Liaison Officer, and Safety Officer—as well as General Staff—Planning Section Chief, Operations Section Chief, Logistics Section Chief, and Finance and Administration Section Chief.

### 2. ICS Business Process

The organization follows an established “clock” of business processes aligned to the “Planning P” cycle and publishes Situation Reports and Incident Action Plans at least once per operational period.

Specifically, EMI also used a modified “Planning P” concept from Incident Command System representing the *business processes that underpin* an EOC operation as additional lens to interpret how the physical space occurs to support the specific needs of DarMAERT.

The six (6) stages of the Planning P, as described in detail in the *SOP Handbook* and presented in Figure 2, were:

1. **Activate** the EOC
2. **Build** the Situation Report and Incident Objectives
3. **Create** the Incident Action Plan
4. **Disseminate** the Incident Action Plan
5. **Execute** the Incident Action Plan
6. **Finish** the EOC Activation (de-mobilization and After Action Report).

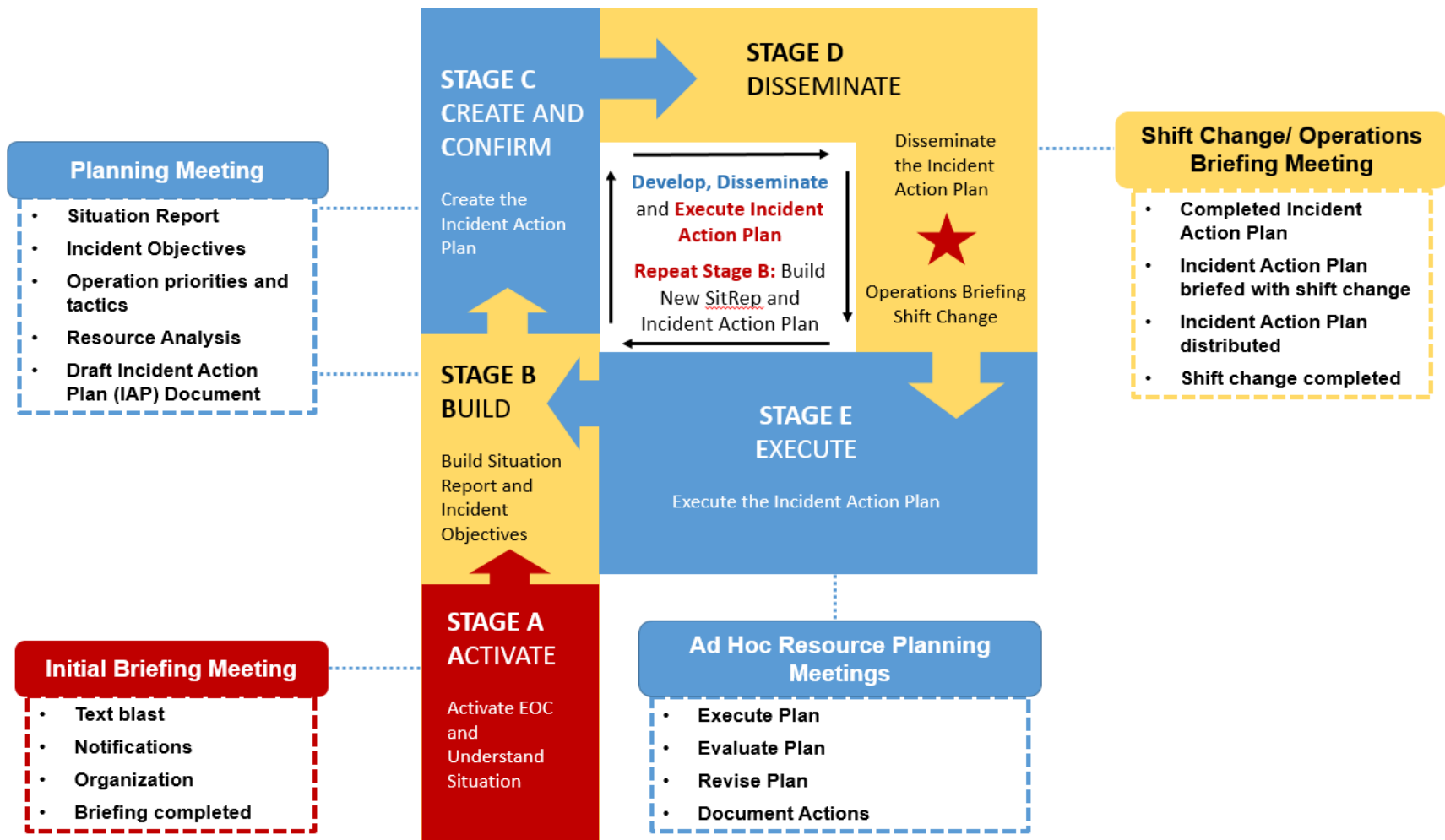


Figure 2 Planning P Process of EOC Activations

### 1.3. International EOC Best Practices and Case Studies

Across the world, there have been many documented EOC best practices and case studies that contributed to the development of the DarMAERT EOC design and protocols. It had been important to draw critical elements from international EOC best practices to ensure the effectiveness, reliability and sustainability of the DarMAERT EOC. Selected successful examples of effective EOC design and construction specifically in Africa, Asia and the Middle East are presented below.

#### 1.3.1. EOC Projects in Africa

##### 1.3.1.1. Guinea, Liberia, and Sierra Leone

Health-specific EOCs established by the US Centers for Disease Control (CDC) and the governments of **Guinea, Liberia, and Sierra Leone** to provide response coordination to the 2014 Ebola outbreak (Figure 3). Per the CDC Foundation, “At the peak of the Ebola epidemic in West Africa during the summer of 2014, the U.S. Centers for Disease Control and Prevention (CDC) and officials from Guinea, Liberia and Sierra Leone identified the need for public health emergency management systems and physical emergency operations centers (EOCs) to coordinate Ebola response activities. During a public health emergency like Ebola, EOCs serve as command centers that bring all response functions together in one location. More specifically, the EOCs and incident management systems established for the Ebola response enabled better coordination of national activities, faster decision-making and data sharing among public health experts and emergency response partners.”<sup>8</sup>

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<sup>8</sup> *Dedicating Emergency Operations Centers in West Africa*. CDC Foundation. Sept 17, 2015. <https://www.cdcfoundation.org/blog-entry/dedicating-emergency-operations-centers-west-africa>. Accessed: Mar 24, 2020.



*Figure 3. EOC established in West Africa during the 2014 Ebola outbreak. (Image courtesy: Charles Stokes, CDC Foundation.)*

#### 1.3.1.2. Senegal

In West Africa, **Senegal's** EOC also emerged as a response to the 2014 Ebola outbreak and was considered as a model with 11 permanent staff members, tasked to actively monitor infectious disease alerts and develop plans to respond to future outbreaks. The EOC has been utilized to coordinate activities for a chikungunya outbreak and managing Senegalese casualties in the Hajj stampede. EOC members participate in Public Health Emergency Management Fellowships, learning from experts in emergency management, developing systems to implement in Senegal's EOC.<sup>9</sup>

### 1.3.2. EOC Projects in Asia

#### 1.3.2.1. Bangladesh

In **Bangladesh**, best practices include the effective diagnosis of the country's emergency response system, focusing on Dhaka's concept of operations, and successful development of city-level disaster

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<sup>9</sup> *Senegal: Emergency Operations Center becomes a Model in West Africa.* CDC Foundation. (n.d.) [https://www.cdc.gov/globalhealth/security/stories/senegal\\_eoc\\_west\\_africa.html](https://www.cdc.gov/globalhealth/security/stories/senegal_eoc_west_africa.html)

Accessed: June 18, 2020

response system, including EOC design, communications system, plans and related trainings and drills through a 2014-2015 project of the Government of Bangladesh with the World Bank. GEODASH, a web-based platform for data and information sharing, and the Dhaka Earthquake Risk Atlas contributed to the city's information-building on earthquake hazards as basis for a highly responsive emergency management system customized for specific scenarios. This strengthened the capacity of government agencies to respond to emergency events facilitating 68 wards with decentralized emergency response services in Dhaka and 20 wards in Sylhet. As of the publication of this EOC handbook, constructions and renovations for the EOC design prescribed for the project, have been finished. ICT tenders are also to be finalized by mid-2020 with all equipment expected to be installed until June 2021.

#### 1.3.2.2. India

The EOC initiative in **Mumbai, India** involved more than 100 institutions from all three (3) levels of government, academe, the private sector and civil society in Mumbai, which is the third most populous city in the world. It included detailed and scientific analysis of DRM and EOC operations of the Municipal Corporation of Greater Mumbai (MCGM), as well as local-capacity building and training to improve local expertise. This is encapsulated in the formulation of the Disaster Risk Management Master Plan model for Mumbai, replicated in other cities in the state of Maharashtra and across India. Useful steps such as the analysis of Mumbai's emergency call system, update of facilities and operational design of the MCGM's EOC to implement integrated emergency management, and Emergency Support Function (ESF) design and training provided the elements for a major upgrade and sustainability of the entire DRM and emergency management system.

#### 1.3.2.3. Philippines

In the private sector in the **Philippines**, an EOC based on best practice design and specifications adhering to international guidelines was used by the Philippine Disaster Resilience Foundation using a roadmap developed by EMI to achieve readiness level targets. The project involved the completion of a temporary EOC in Makati City with identified EOC staff, SOPs, ConOps, supported by the procurement and installation of IT telecom equipment based on an integrated data center and telecom design. It was operational for 2 years prior to building and equipping a new state-of-the-art EOC facility at the New Clark City that is currently fully operational. One prominent feature of the EOC is the utilization of the Disaster AWARE platform of the Pacific Disaster Center, which allowed the PDRF to integrate reliable and timely information for climate- and disaster-related data into its EOC operations.

Meanwhile, in the public sector, local governments such as Pasig and Quezon City have conducted Emergency Management Accreditation Program (EMAP) Gap Analysis and implemented improvements in EOC software, hardware and Geographic Information System (GIS) applications, and flood early warning system. There were investments in building a new emergency and fire training center, where it offers training services to other local governments.



### 1.3.3. EOC Projects in the Middle East

#### 1.3.3.1. Jordan

The Ministry of Health EOC in **Amman, Jordan**, which, according to CDRF Global “consists of a large meeting table equipped with state of the art data management, video and teleconferencing capabilities, and smartboard technology, all supported by an uninterrupted power supply. When responding to a public health emergency, the EOC can coordinate its field offices throughout Jordan’s 15 governorates, while also serving as an important hub of communication and coordination between ministries, agencies and various other partners. In the U.S., civil defense organizations, FEMA, disaster relief organizations, and countless state, local and regional entities have chosen the EOC model for outbreak and disaster preparedness and response.”<sup>10</sup>

#### 1.3.3.2. Turkey

The robust Emergency Operations Center **in Istanbul, Turkey**, which also includes Command and Control Centers to support redundancy during a catastrophic event. Per the Republic of Turkey Istanbul Governorship, “these new operational command centers have a reliable and modern infrastructure with a high accessibility. One of the centers (Akfirat) is located in the Anatolian side of city while the other one (Hasdal) is in the European side. They are capable of providing continuous disaster management operation for fourteen (14) days after a disaster with 500 staff members for not only limited to the city center, but also all of the districts city-wide...Command centers gained the ability to command centrally during an emergency or a disaster within İstanbul Disaster Response Plan (ISTAMP) with meeting rooms and command center chambers. These meeting chambers are equipped with smart systems that retrieve data from Service Units of ISTAMP. This data contains real time updates with images from the field and live broadcast among other information.”<sup>11</sup>

Planning Assumptions specific to the DarMAERT EOC is are described in the next section, below.

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<sup>10</sup> *The Importance of Emergency Operations Centers for Global Health Security*. CDRF Global. Oct 15, 2020. <https://www.crdfglobal.org/insights/importance-emergency-operations-centers-global-health-security>.

Accessed: Mar 24, 2020.

<sup>11</sup> *Enhancement of Institutional and Operational Capacity of Istanbul AFAD*. Republic of Turkey Istanbul Governorship. <https://www.ipkb.gov.tr/en/what-is-ismep/a-component/enhancement-of-institutional-capacity-of-istanbul-afad/>. Accessed: March 24, 2020.

## 2. DarMAERT EOC – Planning Assumptions

To manage the expectations regarding reconfiguration of the DarMAERT EOC, the following were the baseline Planning Assumptions per International Standards category, as well as the Planning P. These Planning Assumptions were key underpinnings of the subsequent Findings and Recommendations.

### 2.1. Planning Assumptions: Facility Features

- The EOC is housed, and will continue to be housed, in two contiguous rooms with four (4) entrance and egress points at the large Ilala Fire and Rescue Station and is dependent on Fire and Rescue facilities support. Physical parameters were analyzed and presented in the EOC Walkthrough Report that was appended to the Mission Report from Module 1, and conducted with DarMAERT on April 10, 2019 as part of Day 3 of TED delivery. These outputs were presented in Annex I. DarMAERT had confirmed an intent to also enclose two balcony areas to add additional area to the existing layout, which was also integrated in the subsequent recommendations.
- The EOC facility currently has poor sound acoustics that could affect a major activation. Given the current structure, it is expected that the EOC will be crowded and noisy, with negative impact on operational efficiency.
- In general, FEMA recommends a minimum EOC sizing as 50 square feet (15.24 m<sup>2</sup>) per person, with 80 square feet (24.38 m<sup>2</sup>) being ideal.<sup>12</sup> The current EOC layout (at approximately 645 square feet or 196.60 m<sup>2</sup>) would translate to approximately 13 personnel at the current EOC location, not counting the proposed renovations of the awning areas.

### 2.2. Planning Assumptions: Survivability

- The EOC is serviced by the current canteen, for food. Power, water, and sanitation facilities are provided by the Fire and Rescue building.
- The current rooms lack a back-up generator and Uninterrupted Power Supply (UPS).
- Electricity, lighting, water, and sewer, and (potentially) communications are not guaranteed and may be interrupted.

### 2.3. Planning Assumptions: Security

- No EOC signage is present or in the process of being created, nor are emergency exits marked.
- Fire suppression support for the EOC is assumed.
- There is currently no dedicated security officer during DarMAERT EOC activations.

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<sup>12</sup> *Understanding and Maintaining Emergency Operations Plans*. Federal Emergency Management Agency. November 2010. [https://www.fema.gov/media-library-data/20130726-1828-25045-0014/cpg\\_101\\_comprehensive\\_preparedness\\_guide\\_developing\\_and\\_maintaining\\_emergency\\_operations\\_plans\\_2010.pdf](https://www.fema.gov/media-library-data/20130726-1828-25045-0014/cpg_101_comprehensive_preparedness_guide_developing_and_maintaining_emergency_operations_plans_2010.pdf). Accessed: March 24, 2020.

## 2.4. Planning Assumptions: Sustainability

- Total number of required personnel workspaces to occupy the EOC is **26**:
  - **10** positions representing the “Silver” Tactical Command elements of DarMAERT composed of a representative from each the following offices:
    1. Regional Commissioner’s Office - Assistant Regional Administrative Secretary – Planning and Administration
    2. DarMAERT - Coordinator
    3. Hospitals – Regional Medical Officer (RMO)
    4. Police-999 + Traffic
    5. Fire and Rescue
    6. Tanzania Red Cross Society
    7. Ambulance
    8. NGO
    9. Social Welfare
    10. Private Sector
  - **8** positions from the Incident Command System – Command and General Staff positions, plus the EOC Manager. Per TED Module 2, one best practice to staff these functions was to backfill a deputy if these positions originate from Silver Command, to enable the deputy to focus on the functional response area.
  - **5** District/Municipal Representatives
  - **2** Support Staff (1 Economist, 1 ICT Expert and one Analyst from Regional Administrative Secretary - Planning and Administration)
  - **1** Security Staff
- No part-time, nor full-time, EOC personnel or EOC facility manager or security officer is available to support the EOC.
- The recommended EOC layout supported the integration of elements of Incident Command System organization.

## 2.5. Planning Assumptions: Interoperability

- Internet and cell phone services are assumed to be available.
- VHF Radio Communication are assumed to be available.
- A dedicated geographic information system personnel for maps and graphics is assumed available to the EOC.
- For the foreseeable future, the DarMAERT response operations will be conducted as usual, using hand-held radio communications, supported by cell phone communications, with situation reports being compiled on paper, and situation reports being transmitted to the

Disaster Management Department (DMD), Dodoma, the public, and the press, over radio communications. Significant communication within DarMAERT occurs within the social media platform WhatsApp.

- Digital communications at the EOC following a disaster will be limited, sporadic, or severely limited. Thus, the reconfiguration and operations of the EOC is not assumed to be dependent on the internet or other digital communications.

## 2.6. Planning Assumptions: Flexibility

- The current configuration for the DarMAERT EOC is using VHF radio system for response operations. There are Furniture and equipment at the operation room and conference room to facilitate communication, video conferencing, emergency management system and monitoring of radios through GPS system. Other system used are phone calls and WhatsApp through specific group.
- No dedicated digital information management system, presently there are 4 personnel available for developing Situation Reports to support the EOC.
- Currently, no digital maps but there are physical maps developed by Ramani Huria available at the EOC.
- As a result of the Training, Exercises, and Drills Program, DarMAERT had adapted, adopted, and instituted a compatible version of the Incident Command System (ICS) that made most sense to DarMAERT as a response organization. This was described in the companion *SOP Handbook*.

## 2.7. Planning Assumptions: Planning P Interpretation

- The “Planning P” process of *Activating the EOC, Building the Situation Report, Creating the Incident Action Plan, Disseminating the Incident Action Plan, Executing the Incident Action Plan, and Finishing the Incident Action Plan* is an appropriate additional lens to interpret the Findings and Recommendations.

### 3. DarMAERT EOC - Findings

The following section describes the Findings regarding the physical characteristics of the EOC. These findings were originally documented in a physical walk through of the DarMAERT EOC in Module 1 (attached in Annex 2), and subsequently expressed in the International Standards Checklist as part of the DarMAERT co-design process during Modules 2 and 3. This detailed input table was proved in Annex 3, but summarized below in table format in Table 1, in addition to an interpretation of Findings through the Planning P.

A tool to support analysis of the Findings was the creation of a schematic of the current layout of the DarMAERT EOC, first in AutoCAD then in Room Sketcher. This current layout is presented below in Figure 4.

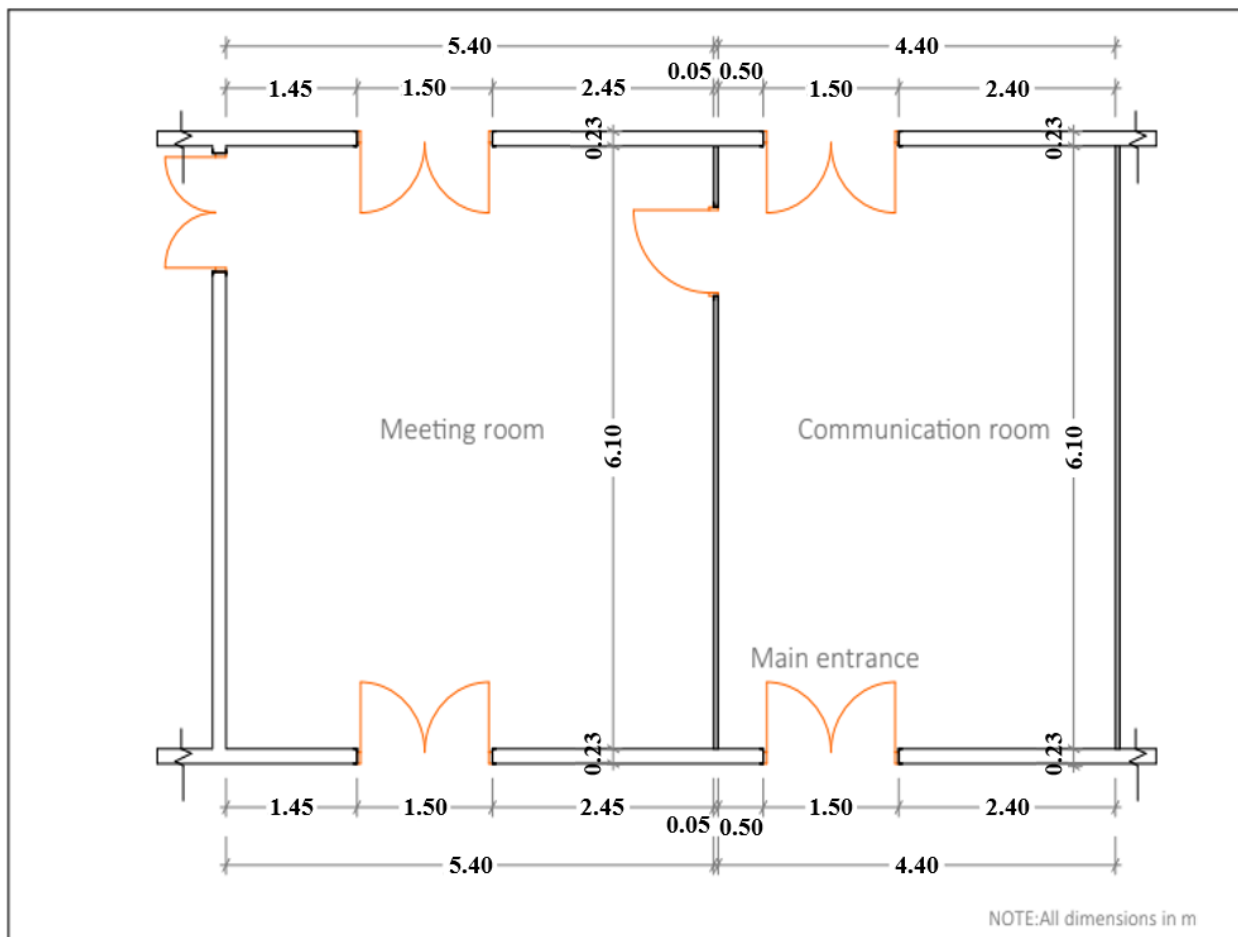


Figure 4. Current DarMAERT EOC Layout

Table 1. EOC International Standards Findings for the DarMAERT EOC

EOC International Standard	Finding
3.1. Findings: Facility Features	<p>Co-located on second floor of Ilala Fire Station.</p> <p>Conveniently located to municipal buildings, but roads can be congested.</p> <p>Currently two rooms; additional space needs to be expanded within existing floorplan.</p> <p>Building resilient to wind hazards but nearby proximity to flood source.</p> <p>Includes parking spaces with parking overflow helipad area.</p> <p>No back-up redundant EOC identified at present time.</p>
3.2. Findings: Survivability	<p>Nearby flood source (~50 m) needs to be monitored for potential impact on EOC and its operations for large-scale flooding event.</p> <p>While seismic risks are generally minimal in Dar es Salaam, future retrofitting (including non-structural) to address probable vulnerabilities to seismic risks is recommended.</p> <p>EOC is elevated by its placement on 2<sup>nd</sup> floor of Ilala Fire Station.</p> <p>DarMAERT VHF/UHF Radio system has a redundant power (battery) source.</p> <p>Building lacks lightning protection system for thunderstorm hazard.</p>
3.3. Findings: Security	<p>No current security system or credentialing process.</p> <p>No current protocol for 24x7 access during EOC activations.</p>
3.4. Findings: Sustainability	<p>No current kitchen/tearoom/rest area to help sustain DarMAERT staff for sustained EOC activations.</p>

	<p>HVAC system fails to consistently cool the current EOC.</p> <p>No redundant power source for EOC.</p> <p>No accommodations nor signage for those with disabilities.</p>
<b>3.5. Findings: Interoperability</b>	<p>Communication protocols with other agencies currently unclear.</p> <p>Communications monitoring process beyond current DarMAERT VHF/UHF band confined to Emergency Response Functions.</p> <p><i>DarMAERT uses social media (WhatsApp), mobile phone, landline and VHF/UHF Radio system to communicate among members.</i></p>
<b>3.6. Findings: Flexibility</b>	<p>Current EOC layout does not flex to accommodate an increase in activation level.</p> <p>Identified need to focus on business continuity in case EOC experiences downtime.</p>
<b>3.7. Findings: Planning P Interpretation</b>	<p>No component in identified space to support intake/credentialing during <b>Phase A – Activation of the EOC.</b></p> <p>Information synthesis, creation of objectives, and mission execution primarily takes place in the common central room during <b>Stage B – Building the Situation Report, Stage C – Create the Incident Action Plan, Stage D – Disseminate the Incident Action Plan and Stage E – Execute the Incident Action Plan.</b> Private meetings occur in the second office space, but not tied specifically to Planning P functions at the present time.</p>

## 4. DarMAERT EOC – Recommendations

It is recommended that the following EOC reconfiguration and upgrade from the current layout in Figure 4 to the proposed layout in Figure 5 **Error! Reference source not found.** and Figure 6 below. A 3-Dimensional live walkthrough can be accessed at: [https://gallery.roomsketcher.com/live3d/?ctxt=rs\\_app&pid=7104272](https://gallery.roomsketcher.com/live3d/?ctxt=rs_app&pid=7104272). The following is an overall narrative of the recommended schematic.

Create five (5) primary spaces within current layout:

- Main room (Situation Room) for General Staff, Emergency Support Functions, and District representatives
  - Break-out room for Command Staff
  - EOC Manager's Office (to include secure communications)
  - Joint Information Center/Media Room
  - DarMAERT Management Office (DMO) beside the DarMAERT Secretariat Office (DSO)
- The EOC will maintain its outer walls and redesign the interior space by moving the one non-structural, partition wall.
- Security Station to log-in and limit arriving personnel through one entrance. Note that three additional doors do exist.
- There will be a dedicated office for the DarMAERT Coordinator, EOC Manager and Deputy Manager/ Coordinator. This office will also reserve one space for the DMD Liaison Officer from Dodoma.
- The Office for Command Staff will include the Public Information Officer, Safety Officer, and Liaison Officer. (Note that the Command Staff Liaison Officer is in addition to the District Disaster Management Coordinators that serve as a liaison function to each district.)
- The Situation Room for General Staff will include the Operations Section Chief, Planning Section Chief, Logistics Section Chief, and Financial Management Section Chief. (Operations and Planning Section Chief really need staff but space is severely limited, eliminating support personnel.)
- It was recommended that the Situation Room will also house the five (5) District Disaster Management Coordinators in designated spaces, with district maps to support their situational awareness. There should hence be dedicated space in the EOC for the five (5) districts.
- Situation Room for key Emergency Response Functions only, due to limited space, i.e. Communications, Transportation, Medical & Health Services (Ambulance & Tanzania Red Crescent Society/ Red Cross), Fire & Rescue, and Safety and Security.
- As part of the EOC plan design, other ERFs not represented at the EOC should establish alternative Disaster Control Rooms in Dar es Salaam supported by communications protocols in place.
- The EOC Manager Office is a private-to-semi-private office, and is required to accommodate decision-making behind closed doors for the EOC Manager, supported by the EOC Manager



Command Staff (i.e., Public Information Officer, Safety Officer, and the Liaison Officer). This EOC upgrade requirement is accommodated in the new EOC design.

- Sharing of EOC Manager's Office is necessary due to severe space limitations. This private office area for the EOC Manager must also accommodate, or be shared by, other important decision-makers and dignitaries, such as the Regional Administrative Secretary or Deputy RAS (as EOC Manager), and potentially, the DMD liaison.
- Security and Financial Management are considered. Security check-in and login is required and was accommodated in the new EOC design. Personnel check-in and check-out provides a time record for all personnel, and manages any potential audit and financial requirements.
- A Media & Joint Information Center is included with a sliding door to the Press Area beside the Reception. Media requirements are accommodated in a very limited capacity within a controlled area near the entrance of the upgraded EOC design. The glass wall design provides media representatives the opportunity to observe operations in the Operations Room for pictures and video, without interrupting operations and decision making. This best practice provides information to the public, via the media, about the disaster, as well as to demonstrate that DarMAERT is managing the disaster through EOC operations. Under normal circumstances, the small media room would be larger, creating a Joint Information Center. Additional recommendations per checklist category are presented in Figure 5 below:





*Figure 6. Recommended EOC Layout (3-Dimensional)*

## 4.1. Recommendations: Facility Features

- Continue with DarMAERT's plan to utilize additional neighboring space to create break-out areas for Emergency Support Functions, a kitchen/ tearoom/ meal serving area, and potential sleeping quarters/ rest area with room for two (2) convertible sofa beds.
- TV displays to be placed in (a) Press Area beside Reception, (b) Joint Information Center, (c) EOC Manager's Office, (d) Command Room, (e) Tea Room and (f) Rest Area to provide updated information, newscasts, and data to EOC personnel, and to be used for visual presentations/ discussions for meetings/ briefings as necessary.
- Replace windows with wind-resistant jalousie windows and install exterior wind- protection shutters.
- Soundproofing improvements for the EOC:
  - Include an all-weather carpet to deaden sound.
  - Add dropdown acoustic ceiling panels with uniform fluorescent or LED lighting panels, air conditioning vents, and public address system.
  - Line all structural walls acoustic panels.
- Wire walls and ceiling to accommodate internet and TV monitor cables and electrical outlets for all computer and display needs, including a ceiling-mounted projector. (Note: EMI is not responsible for this wiring configuration.)
- Discuss parking overflow options with other government agencies, or potentially utilize football field/helicopter pad for overflow parking.
- Develop a *Memorandum of Understanding (MOU)* with the Fire and Rescue Service building facilities that spells out a clear understanding of services provided to the DarMAERT EOC on a daily, administrative basis as well as during 24/7 operations. Who pays for what facilities and services? The MOU will help the DarMAERT EOC sustain operations during disasters.
- Identify an Alternate EOC location - potentially via a MOU with a Government Agency office. An alternative EOC could be identified under a retainer arrangement for financial compensation with a MOU in place. For example, following a disaster declaration, DarMAERT has priority for occupation of the facility for an extended period. Please note that this has been identified as a key planning assumption and emergency management directive in the 2020 DarMAERT Emergency Response Plan Update.
- A mobile EOC should also be considered for the establishment of a major incident command station, for such incidents as a building collapse or a bomb blast as an isolated event. Parameters are available for these types of vehicles.
- As a general rule, all spaces shall be designed to fit as many people as possible without sacrificing from the ergonomic standards.
- All doors shall be sliding doors, preferably electronic, with digital access control devices for the critical rooms to maximize available space.

- The server room minimal dimensions should take at least four rack cabinets of with dimensions of 80x60x200 centimeters each.
- Tea Room should potentially be furnished in such a way that all the walls and the center space shall be utilized for dining tables so that people can also use the wall space facing to the wall while dining if they prefer privacy.
- The area in the Situation Room (also known as the Operations Room), where most of the Emergency Response Functions representatives will be seated, and where major briefings will be conducted, shall be designed to accommodate as many people as possible and can consider a bigger rectangular table or a U-shaped configuration if appropriate.

## 4.2. Recommendations: Survivability

- Maintain awareness of proximity of flood source to EOC.
- Prioritize monitoring of local flooding by Fire Department and its potential impact to nearby road closures and any impact of flooding to EOC itself.
- Service surrounding drains as it was observed that most of them are blocked.
- Conduct regularly monitoring and maintenance of drainage system near the EOC to mitigate the impacts of flood events.
- Create an emergency plan to safely evacuate EOC staff in a flood event.
- Place accessible emergency exit in Tearoom/ Kitchen (see Figure 5) across the doorway to the central main area to ensure ease in evacuation.
- Place emergency lights in strategic locations and leading to the emergency exit in the Tearoom to provide visibility during evacuation, or in the case of power outage.
- Consider relocating DarMAERT radio and all Information and Communications Technology (ICT) equipment from the ground floor (Control room -Fire Station) to the second floor (EOC) or to another area of the fire station at the second floor. Elevating communications equipment is a mitigation measure in case of a flood event. For this purpose, full review of the building's current electrical and mechanical systems is recommended.
- Evaluate safety of all antennae and antennae masts to survive high wind episodes.
- Evaluate the safety and operational protocols of the helipad area to ensure the safe operation of aircraft.
- Create Standard Operating Procedures specifically for safety in the event of a human-caused incident impacting the EOC, such as an explosion or chemical incident and deploy one fully equipped Chemical, Biological, Radiological and Nuclear (CBRN) response unit at the EOC.
- Conduct routine maintenance or retrofitting on building windows and roof to ensure no leaks or external wind damage during severe weather events.
- Also consider possible seismic risks in the area and include in future improvements the retrofitting of the structure accordingly.
- Inspect current electrical wiring system for safety protocols and install grounding system to protect against lightning hazard.



- Additional air conditioners should be added to the building during the renovation process; suitable power calculations and electrical cabling to carry the new HVAC load are needed before/during the renovation.
- Enhancing the water depot capacity and food supply (fabricated dry food packs used in emergencies by field responders) should be considered to support redundancy.
- Containers may be installed in the garden area of the EOC as redundant sleeping quarters.

### 4.3. Recommendations: Security

- Security check-in/check-out desk proposed in recommended layout.
- Ensure that protocols are in place for 24/7 building access by essential DarMAERT staff.
- Install security cameras and consider security barriers.
- In general, physical security measures (such as increasing the number of security officers, visitor log procedures, X-Rays, a Closed-Circuit Television system, etc.) should be strengthened in a phased approach depending on the budget.
- Implement a badge system to control access to the EOC, managed by the security check in/check out desk.
- Ensure that there are processes with other agencies (i.e. police) to ensure that security can be increased if there is an increased threat.
- Ensure that classified and sensitive information as well as secure communications occur in a private area (i.e., EOC Manager's Office).

### 4.4. Recommendations: Sustainability

- Ensure that "overflow areas" beyond current planning assumption of current space are utilized as a kitchen/ feeding area and that these are stocked with adequate supplies for 24/7 operations.
- Install Uninterrupted Power Supply (UPS) equipment for computer and radio systems during power outages.
- Install a back-up generator (stand-alone or portable) for power outages located outside of the EOC to maximize space and reduce disruptive noise produced by the generator.
  - Include adequate fuel storage supply for the generator.
  - If stand-alone generator is purchased, flood-proofing the generator and fuel supply is recommended, such as elevating the generator at least 5 feet (1.52 m<sup>2</sup>) above ground surface (grade) to provide resilience to potential localized flood events.
- Create and post signage for exits and safety protocols to follow in the event that the EOC itself experiences an emergency.

- Create and post DarMAERT EOC-specific signages (i.e. functional group identifiers, room labels, DarMAERT EOC logo).
- Consider installation of stairway rails to support ease of access.
- Install Heating, Ventilation, and Air Conditioning (HVAC) system.
- Use portable fans/window fans if it is not possible to install an air conditioning system
- Set file cabinet to allow for access but not disruption to movement within the EOC (i.e. Command Room).
- Consider a thorough analysis of the electrical, mechanical, structural, non-structural, architectural and ICT systems of the building especially for future improvements and investments in the facility.
- Signage can be added on the roads and main arteries heading to the Dar es Salaam EOC to support easy access to EOC and establishing citizen trust.

#### 4.5. Recommendations: Interoperability

- Ensure that DarMAERT is able to communicate with:
  - Response operations in the field
  - District representatives
  - National EOC/National Officials
  - Regional Administrative Secretary
  - EOCs of neighboring jurisdictions
  - Other Operations Centers (i.e. public health, infrastructure, private sector utilities)
  - Incident Command/Command Post in field
- The Dar es Salaam EOC can be added to the database of Google Earth and other local/ national/ international geo-databases for establishing visibility on all domains and establishing citizen trust.

#### 4.6. Recommendations: Flexibility

- Create safety protocols that describe the process for relocating to an Alternative EOC, once an alternative facility is identified and secured.
- Exercise *Continuity of Operations* procedures to an Alternative EOC, once an alternative facility is identified and secured.
- Consider outside balcony areas as “overflow” areas with breakout space, potentially retrofitted with awnings.
- Activate existing satellite television capabilities to allow existing TV to display news feeds during an emergency. Add satellite television systems to enhance capture of multiple news feeds.
- Utilize existing space for display boards and five district-level maps to be able to synthesize information from damage assessments, situation reports, and objectives through Incident Action Plans.

- Install static *Situation Awareness Displays* on walls as designated in diagram (see Figure 5). For Writable Status Boards, note that the EOC can be upgraded with sliding displays, where one display can slide over another display. Displays can be a combination of static GIS maps, writable information status boards, such as Emergency Support Function Matrix (or ERF Table) or Call Down telephone lists. Displays can be dry erase boards to update status of disaster situation, such as locations of road closures or evacuation shelters, for example.
- Utilize a *Resource Tracking System*, such as an ICS T-Card rack for resource visualization and decision support. For advanced learning and to facilitate a more detailed IAP, some useful forms include ICS Form 219, ICS Form 204 and ICS Form 215.
- Install intercom system within EOC to allow for announcements to be broadcast.

#### 4.7. Recommendations: Planning P Interpretation

Implement proposed EOC lay-out to support the business processes inside the EOC. The recommended EOC Layout, referenced above in **Error! Reference source not found.** was designed through the lens of the “Planning P” concept in Incident Command System (ICS) that follows the “clock” of EOC business processes. This was covered in the SOP Handbook and reviewed extensively in Module 3 of TED delivery.

To begin their work during an EOC activation, DarMAERT members will enter the **Reception** area, a physical space in which a security staff member will sign them in and note their presence in the context of the overall EOC activation staffing plan, representing the **Stage A - Activate** phase of the Planning P.

DarMAERT members will then enter the **Situation Room**—a venue designed to provide deep situational awareness about the unfolding disaster event and corresponding to the **Stage B - Build** phase of the Planning P, where the initial Situation Report and Incident Objectives are created. To support situational awareness and coordination, all five District Coordinators have pre-identified work areas on the wall closest to the Reception area, along with the Health Emergency Response Function (ERF). On the far side of the District Coordinators (and separated with a stand-alone entrance) is the **Dispatch Room**. Together, the Dispatch Room and District Coordinator desks are physical spaces, which are receiving vital information from the field to inform the picture of the evolving disaster. In the middle of the Situation Room is a table for Core DarMAERT staff positions (including Command and General Staff functions) to evaluate incoming information and craft the Incident Objectives. A flat screen television is positioned on the wall of the Situation Room to further support situational awareness.

DarMAERT Command and General Staff who play a critical role in **Stage C - Create** phase of the Planning P have key responsibilities in terms of resource analysis, drafting the Incident Action Plan, and determining operational priorities and tactics. For this vital function, a **Command Room** exists for ICS Command and General Staff to conduct strategy and tactics meetings. The **EOC Managers Office** is located immediately adjacent to the Command Room to support further private meetings and teleconferences with key staff. These rooms are also equipped with flat screen televisions to support situational awareness.



To support **Stage D – Disseminate** of the Planning P, in which the approved Incident Action Plan is Disseminated, the **DarMAERT Management Offices** and a **Joint Information Center** were placed side by side with the Command Room and EOC Manager’ Office. It is in the DarMAERT Management Offices that strategic-level conversations can occur with national and international partners, requiring high-level coordination and dissemination of the Incident Action Plan. The Joint Information Center also conducts media management, public information, and public dissemination functions, and is a “capstone” process of the Planning P, in which the critical aspects of the Situation Report and Incident Action Plan are distilled, synthesized and disseminated for public consumption.

To support **Stage E – Execute** of the Planning P, the **Situation Room** is once again the physical space where this process occurs, as key DarMAERT Emergency Response Functions and the Operations Section Chief track the deployment and mission status on resources tracking and ICS tracking boards—seamlessly recycling into Stage B if required to refresh the Situation Report and revised Incident Objectives should an additional Operational Period is required. The Situation Room is also the physical space where the shift change brief occurs, supported by a podium and audio-visual system to initiate a new operational period. **Stage F – Finish**, the “deactivation” phase of the Planning P, also occurs in the **Situation Room**, and centers on safe demobilization of personnel and assets as documented by ICS resource tracking displays. An After Action Review and hot wash also occurs in the Situation Room.

Supporting these main functional areas are the **tearoom, rest area, server room** and **restrooms** to support DarMAERT personnel in executing sustained EOC operations.

## 4.8. EOC Furniture and Equipment List

As a related activity in analyzing the Findings and developing the Recommendations related to the DarMAERT EOC, requirements for furniture and equipment were also defined. Table 2 below depicts a recommended furniture equipment list to fully operationalize the EOC within the recommended layout and International Standards checklist. Prices had been contextualized by Ardhi University and represented in Tanzanian Shillings.

It is noted that Table 2 is a result of a preliminary study following the contract set forth for the TED program. Hence, a thorough analysis by the DarMAERT and the World Bank is recommended prior decision-making for future investments.

Table 2. EOC Furniture and Equipment Recommendations List

Item	Quantity	Dimensions	Rationale	Equipment Description	Per Unit Price (in TSH)	Total Price (in TSH)
District Desks	5	76x76 cm	1 per District	Work station with left cabinet, Dimensions: 1400 mm x 600 mm x 750 mm (Material: Melamine panel, Leg: Metal)	650,000.00	3,250,000.00
Core Group Working Table	1	228x912 cm	1 for ICS General Staff Functions	10-seater conference table, Dimensions: 3200 mm x 1400 mm x 760 mm, Weight: 123 kilograms, Material: Melamine panel, Leg: Metal	2,354,000.00	2,354,000.00
Command Room Table	1	90x180 cm	1 for ICS Command Staff Functions		645,700.00	645,700.00
EOC Manager's Desk	1	90x180 cm	1 for EOC Manager		645,700.00	645,700.00
Safety/Security Desk	1	76x76 cm	1 for Security personnel		275,000.00	275,000.00
Chairs	26		1 for each identified function	All PU chair, high back with fixed armrest, tilt tension backrest adjustment and seat height adjustment; chrome base, 11kg weight with 100kg weight capacity.	350,000.00	9,100,000.00
Podium	1		1 to support briefings		750,000.00	750,000.00
Flat Screen TV	3	110.7x62.2 cm	For Situation Room, Command Room, and EOC Manager's Office	48" LFD monitor 2X4 LCD Video Wall, LED backlight, Full HD1920x1080P450cd brightness16.7M display color, Low energy consumption16/7 rating	2,300,000.00	6,900,000.00
District Map Print outs	5	60.96x91.44 cm	1 for each District		25,000.00	125,000.00
Plexiglass Map covering (writable)	5	60.96x91.44 cm	1 for each map		120,000.00	600,000.00
ICS Display Status Boards (Overlapping)	4	121.92 x 701.04 cm	Situation Report, Incident Objective, Resource Tracking, Planning Cycle		250,000.00	1,000,000.00
ICS T-Card Rack	1	60.96 x 60.69 cm	1 for resource tracking		70,000.00	70,000.00

Item	Quantity	Dimensions	Rationale	Equipment Description	Per Unit Price (in TSH)	Total Price (in TSH)
Trash Receptacle (large)	1		for Situation Room		20,000.00	20,000.00
Trash Receptacle (small)	3		for remaining rooms		12,000.00	36,000.00
Window blinds (all windows)			to filter sunlight		300,000.00	0.00
Carpeting (all floor area)			For comfort, sound-proofing		717,360.00	0.00
HVAC Unit	1		For air conditioning/		1,000,000.00	1,000,000.00
			ventilation			0.00
Stand-by Generator	1		For Redundant Power	3-5KVA	3,000,000.00	3,000,000.00
Multimedia Projector with Ceiling Mounted Fittings and Remote Control Screen	1		For Situation Room Briefings	Epson EB-2250U-LCD projector-LAN Native aspect ratio 16; <u>10, projection</u> technology 3 <u>LCD, Projection</u> distance 1.5-9metres	5,500,000.00	5,500,000.00
Fire Extinguishers	4		5kg each - for each room		200,000.00	800,000.00
Sound Proof paneling			To improve acoustics		1,200,000.00	0.00
White boards	3	3 feet x 2 feet (0.61m x 0.91m)	To support planning in Situation Room, Command Room, and EOC Manager's Office		55,000.00	165,000.00
AV System with microphone and intercom system	1		For announcing alerts/meetings		2,100,000.00	2,100,000.00
Facility safety signage	10		For display throughout facility		650,800.00	6,508,000.00
Cabinet (locking)	1	91.44x45.72x182.88 cm	For recordkeeping		582,000.00	582,000.00

Item	Quantity	Dimensions	Rationale	Equipment Description	Per Unit Price (in TSH)	Total Price (in TSH)
Laptop Computers	26		For each identified workspace in Planning Assumption	Lenovo Idea pad 330 Laptop Intel Celeron N4000,15.6 Inch,500GB,4GB <u>RAM, DOS</u> -Black	1,100,000.00	28,600,000.00
Laser Printer (black and white)	2		For Command Room and Joint Information Center	HL-L2320D Mono LaserJet printer black	480,000.00	960,000.00
Laser Printer (color)	1		For EOC Manager's Office	Epson printer L805 (print, scan and copy)	800,000.00	800,000.00
High-speed Printer	1		For Situation Room	Epson L1300 A3 4-Color Ink tank Printer	1,700,000.00	1,700,000.00
Copy machine with fax	1		Situation Room	Canon iR22200i A3, <u>A4, A5</u> black, fax, network, print, scan	450,000.00	450,000.00
Scanner	4		For Situation Room, Command Room, Joint Information Center, and EOC Manager's Office	HP 2500 speed up to 40 ipm measured at 300 dpi	2,000,000.00	8,000,000.00
Fax Machine	1		For Command Room	Panasonic Fax Machine FP711CX	45,000.00	45,000.00
Laminating Machine	1		For Joint Information Center; producing signage and information products	Laminating to A3 and A4 paper size	100,000.00	100,000.00
Binding Machine	1		For Joint Information Center; producing reports and information products		250,000.00	250,000.00
Cutting Machine	1		For Joint Information Center; producing signage and information products		40,000.00	40,000.00
Security camera system	1		For security and surveillance	Hikvision DS-2CD4B26FWD-IZ Bullet CCTV Camera 2mp ultra-low light H.265 Smart Security IP Camera	1,792,000.00	1,792,000.00
Wall Clocks	4		For each room		15,000.00	60,000.00

<b>Item</b>	<b>Quantity</b>	<b>Dimensions</b>	<b>Rationale</b>	<b>Equipment Description</b>	<b>Per Unit Price (in TSH)</b>	<b>Total Price (in TSH)</b>
Land Phones	4		For each room	Government Connection	150,000.00	600,000.00
Mobile Phones (data not included)	8		For Command and General Staff	Galaxy C5 Pro, 1.5 GHZ, 5MP, 16GB	45,000.00	360,000.00
Wifi/Router	1		For internet connectivity	LAN ports 4 x 10Base- T/100Base -TX- RJ-45	1,500,000.00	
Installation of lightning protection system, checking and re-organize of electrical system, and installation of electrical grounding system	1		Electrical safety measures for daily operations as well as during lightning storms	(Lightning arrester, copper cabling, lightning counter (optional), lightning earthing system	N/A	16,194,500

## 4.9. Proposed EOC Personnel List

In order to help synchronize the findings of the SOP Handbook with the physical space depicted in the EOC Handbook, personnel requirements and costs were also defined. Table 3 depicts a proposed personnel staffing structure for DarMAERT that allows for the occupation of the facility by twenty-six (26) staff, along with two (2) identified drivers. This includes DarMAERT “Silver Command” personnel, Incident Command System-based Command and General Staff positions, District Representatives, support personnel from the RAS, as well as drivers.

*Table 3. Proposed DarMAERT Personnel List<sup>13</sup>*

<b>Personnel Group</b>	<b>Quantity</b>	<b>Rationale</b>	<b>Per Position (in TSH)</b>	<b>Total Salary Per Position (in TSH)</b>	<b>DarMAERT Comment</b>
DarMAERT Silver Tactical Command	10	Current DarMAERT Silver Tactical Command positions per DarMAERT agencies (no additional cost)	1,000,000.00	10,000,000.00	
8 ICS Command and General Staff full-time positions	8	8 Full-time positions	1,200,000.00	9,600,000.00	
5 District Representatives	5	Current District personnel (no additional cost)	500,000.00	2,500,000.00	
2 Support Staff (1 Economist and one Analyst from Regional Administrative Secretary - Planning and Administration)	2	Salary + benefits x 2 Full-time positions	1,500,000.00	3,000,000.00	
1 Security Staff	1	Salary + benefits x 1 Full-time position	700,000.00	700,000.00	
2 Drivers	2	Salary + benefits x 1 Full-time position	500,000.00	1,000,000.00	During Oct 9 WS: This should be added for logistics, survey and admin purposes

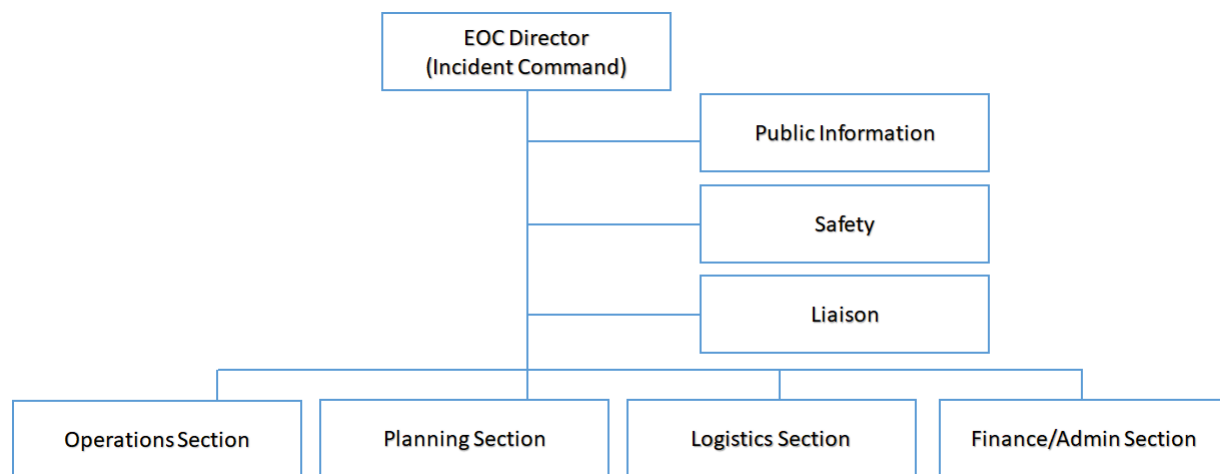
<sup>13</sup> Salaries of proposed DarMAERT Personnel were calculated by ARU in consultation with the DarMAERT Coordinator based on 2019 standard government salary rates

## 5. EOC Management Structure

While the specific details of DarMAERT organizational structure and its comparison to Incident Command System were presented in the companion SOP Handbook, a basic description of Incident Command System in an EOC setting is presented below for context.

### 5.1. Aligning EOC Structure to International Standards<sup>14</sup>

In an EOC setting, ICS can provide staffing for both “Command Staff” – those that support the Incident Commander (or EOC Manager), and “General Staff” – those that carry out specific functions vital to EOC operations as depicted below in Figure 7.



*Figure 7. ICS Organizational Structure for an EOC*

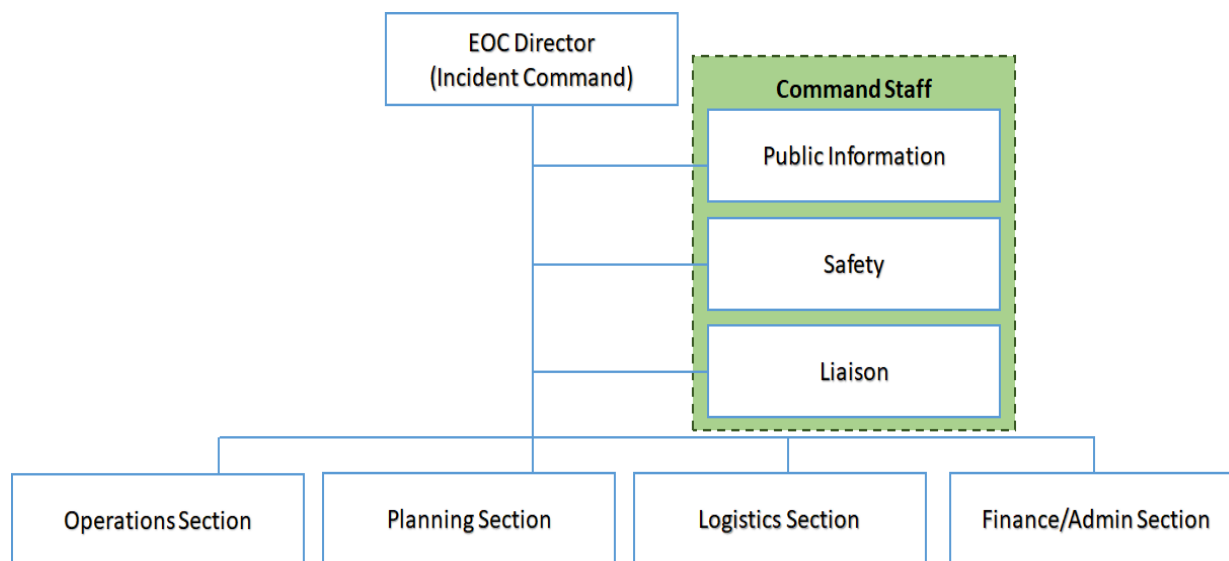
### 5.2. Command Staff

Command Staff carry out functions needed to directly support the Incident Commander/EOC Manager. These staff report directly to the Incident Commander, and include the Public Information Officer, Liaison Officer, and Safety Officer. (See Figure 8.)

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<sup>14</sup> More details in organizational structure and staff roles were outlined in the *SOP Handbook*, which had been developed concurrently within the TED Program.

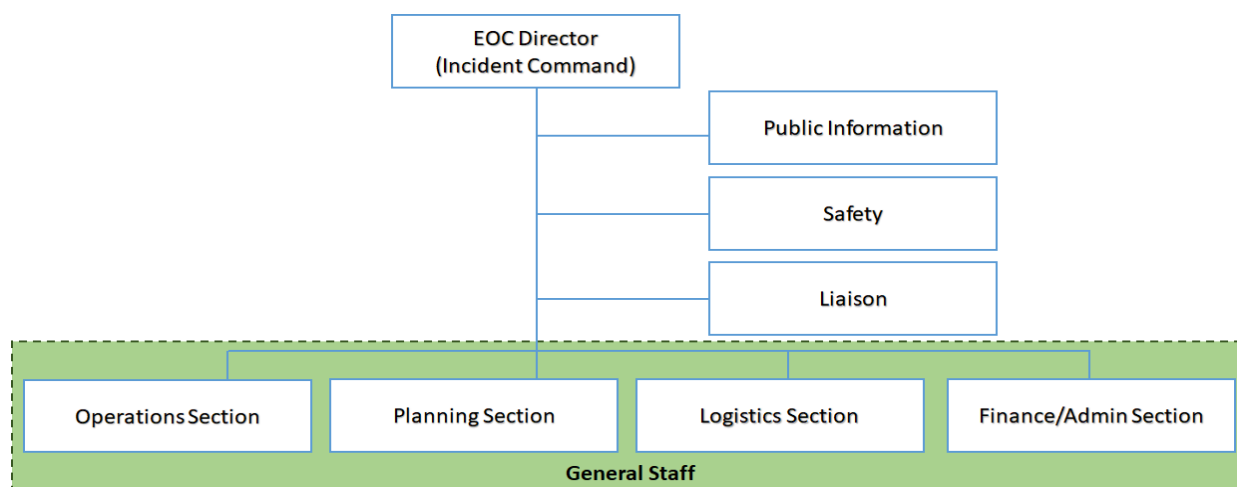




*Figure 8. ICS Organizational Structure: The Command Staff*

### 5.3. General Staff

In the Incident Command System, General Staff are a group of incident management personnel organized according to function and reporting to the Incident Commander. These include the Operations Section Chief, Planning Section Chief, Logistics Section Chief, and Finance/Administration Section Chief. This structure is used frequently to structure EOC operations in an international setting. (See Figure 9.)



*Figure 9. ICS Organizational Structure: The General Staff*

## 2. Annex 1 – History of DarMAERT’s EOC Co-Design Inputs through the Training Exercises, and Drills Program

### Iterative Building Blocks within the Training, Exercises, and Drills Program

The proposed EOC Recommendations were anchored in the broader roadmap of the *Training, Exercises, and Drills (TED) Program for the Dar es Salaam Multi-Agency Emergency Response Team (DarMAERT) (2018-2020)*. The TED program was a series of inter-related trainings, exercises, and drills for DarMAERT developed and implemented under the Emergency Management pillar of the Tanzania Urban Resilience Program (TURP).

One of the deliverables of the TED program was to “propose the structure of the Emergency Operations Center (EOC) and the protocols for its operation and management.” This handbook is a specific product created to address this need and had been refined based on the overall development of the TED program.

The overall structure of the TED program was a series of targeted field investigations (otherwise known as “modules”) consisting of specific “building blocks” of trainings, exercises, and drills. Each module was specifically targeted to an identified “Readiness Level” for each DarMAERT participant to advance through. These Readiness Levels were:

- Readiness Level 1: *Understand* an Integrated Emergency Management System
- Readiness Level 2: *Plan* an Integrated Emergency Management System
- Readiness Level 3: *Practice* an Integrated Emergency Management System
- Readiness Level 4: *Execute* an Integrated Emergency Management System

The culmination of achieving all four *Readiness Levels* was a large functional exercise for DarMAERT conducted at the conclusion of the program. The overall roadmap of the TED program is presented below in Figure 10

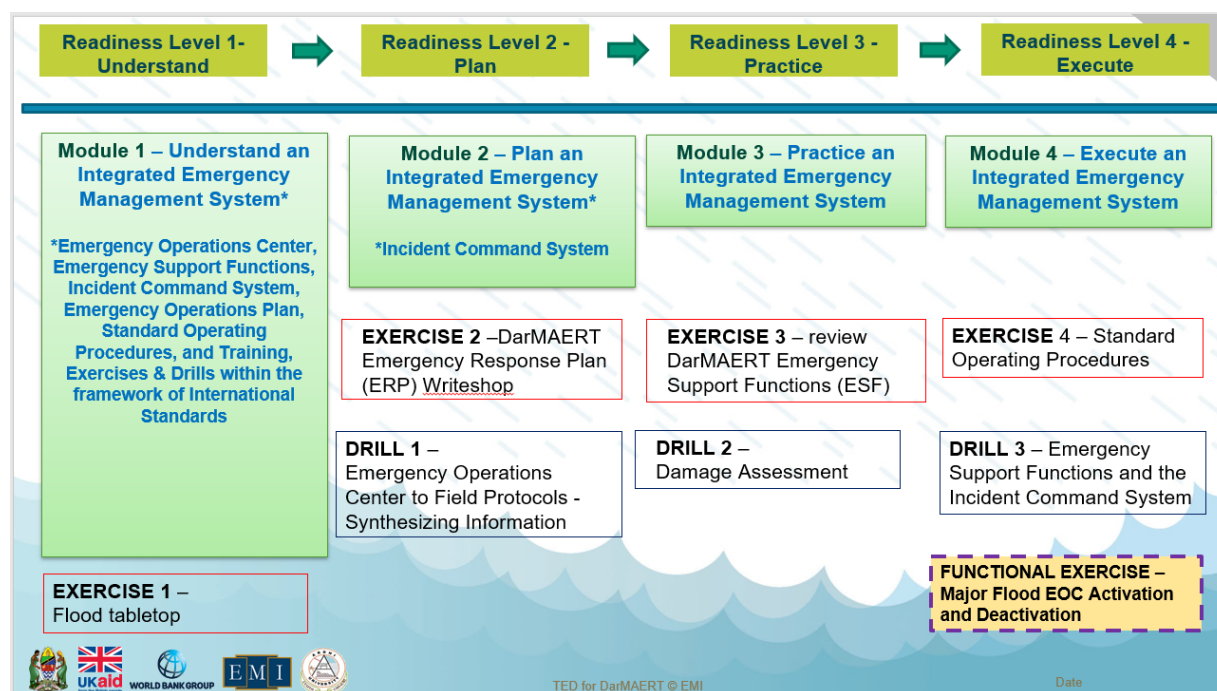


Figure 10. TED Building Blocks and Readiness Levels

## Timeline of EOC-Related TED Activities for DarMAERT

In synchronization with the overall roadmap of TED activities, there was a roadmap for *proposing the structure of the Emergency Operations Center (EOC) and the protocols for its operation and management*. Accordingly, an updated version of the draft form of this Handbook was formulated corresponding to the lessons learned and outputs of each Field Investigation.

The overall roadmap to develop the EOC Handbook had the following baseline versions:

- Version 1.0 - Baseline document of initial physical layout recommendations, and initial operations and management protocols. (Integrates findings from Modules 1 and 2)
- Version 2.0 - Update which included validation of EOC Activation, EOC De-Activation, and Planning and Reporting Criteria, as well as Emergency Support Function (ESF) structure and Damage Assessment protocols. (Integrates findings from Module 3)
- Version 3.0 (Final) - Integration and synchronization with development of Standard Operating Procedures (SOPs) for Command and General Staff EOC Positions and Emergency Response Functions, and tested during the Functional Exercise delivered in Module 4. SOPs

are a separate, but related, activity under the TED program as delivered through the *Standard Operating Procedures Handbook*.

## Human Centered Design and the Design Thinking Methodology

The process for providing recommendations for the DarMAERT EOC was anchored in the concepts of Human Centered Design (HCD), which integrated a human perspective into the problem formulation and solution process. This involved the commitment to observe the EOC problem set within context, brainstorm, conceptualize, develop, and implement the solution. HCD is a deeply participatory approach, and as such, the viewpoints and perspectives of DarMAERT had been critical to this process.

To support the Human-Centered Design approach, the EOC recommendations leveraged a *design thinking* methodology, in which the steps were:

Step 1 – *Empathize* (assess and research the problem set)

Step 2 – *Define* (state the needs and problems)

Step 3 – *Ideate* (Challenge Assumptions and Create Ideas)

Step 4 – *Prototype* (Begin to Create Solutions)

Step 5 – *Test* – (Begin to Test Solutions)

During Module 1, DarMAERT participants, ARU, and EMI conducted the *Empathize* process of the HCD-based design thinking process, wherein an EOC walkthrough was conducted with an input checklist to provide context of the current EOC located at the Ilala Fire Station. The outputs were captured in an aggregate EOC checklist and comprised the *Define* process. During Module 2, an initial re-design of the EOC as well as key planning assumptions was refined as part of the *Ideate* process, which was shared with DarMAERT leadership and the World Bank. Version 1.0 of the EOC Handbook was developed for Module 3, complete with a revised layout of the EOC with 2-dimensional and 3-dimensional renderings. This *Prototype* was reviewed in plenary with DarMAERT participants during Module 3, and in a “Co-Design Workshop” with DarMAERT participants prior to the conduct of Module 4. Finally, the Prototype, baselined as Version 2.0 was tested during Module 4 of TED delivery, which included a Functional Exercise, a Tabletop Exercise, and a Drill. The results of these simulations and their After Action Report was baselined as “Version 3” and delivered to the World Bank, and the Regional Administrative Secretary.

## Evidenced-Based Customization for DarMAERT

It is important to recognize that the recommendations for the DarMAERT EOC were *evidence-based*. This was most notable during Module 3, when Drill 2 - *Synthesizing Damage Assessment Information*

*into the Situation Report and Incident Action Plan*, occurred. During the Drill simulation, which presented a scenario of a catastrophic landfalling cyclone directly impacting Dar es Salaam, the layout of the venue—the ILO Conference Room at the Holiday Inn Dar es Salaam—was modified to reflect the recommended EOC layout; specifically, the five (5) Municipal Coordinators working together in a common workspace to interpret and synthesize local damage reporting information. This business process was observed to be highly effective by the EMI Subject Matter Expert team and was documented during the After-Action Report for Module 3. The effectiveness of this physical layout was also discussed with DarMAERT participants immediately after the Drill, concurrent with a plenary review of the proposed EOC re-design, which included a discussion of the physical space seating for the Municipal Coordinators.

In addition, during the conduct of Module 3, DarMAERT coincidentally conducted a real-world partial activation during the training venue to respond to a thunderstorm and flooding event. DarMAERT was observed by the EMI Subject Matter Expert Team to be using information provided during TED delivery, including damage assessment forms and Situation Report templates. In terms of physical space, DarMAERT also projected the Situation Report to all DarMAERT members in real time and led a careful plenary facilitation of Situation Report inputs through the direction of the Acting EOC Manager, similarly replicating a process that would occur within the Situation Room of the recommended DarMAERT EOC layout. A photograph of this layout during the real-world partial activation is depicted below in.



*Figure 11. DarMAERT activates for a real-world severe thunderstorm and flooding event on November 21, 2019 during Module 3 of TED Delivery.*

## Annex 2: EOC Walk-through Checklist per Module 1 Mission Report

The following is the EOC “Walk through” checklist that was compiled following Module 1 (Field Investigation 2) on April 10, 2019 and appended to the TED Mission Report for Module 1.

EOC Characteristic	Observation	Initial Recommendation
<b>EOC Design</b>		
Communications and Redundancy	<ul style="list-style-type: none"> <li>• Adequate high-speed internet was present</li> <li>• Back-up UHF Radio System available for DarMAERT, located on first floor (Fire Station)</li> <li>• UHF Radio System had a range of approximately 30-52 hours back-up battery power</li> <li>• Internet vulnerable to sporadic outages</li> </ul>	<ul style="list-style-type: none"> <li>• Consider investment in Uninterrupted Power Supply equipment for computer and radio systems during power outages.</li> </ul>
Power and Redundancy	<ul style="list-style-type: none"> <li>• No back-up generator on site</li> </ul>	<ul style="list-style-type: none"> <li>• Consider investment in back-up generator (stand-alone or portable) for power outages.</li> <li>• Include adequate fuel storage supply for the generator.</li> <li>• If stand-alone generator is purchased, recommend flood-proofing the generator and fuel supply, such as elevating the generator at least 5 feet (1.52 m<sup>2</sup>) above ground surface (grade) to provide resilience to potential localized flood events.</li> </ul>

EOC Characteristic	Observation	Initial Recommendation
Display Boards, Status Boards, and other Visual Aids	<ul style="list-style-type: none"> <li>● Television system was present but not operational</li> <li>● No maps or display boards on EOC walls but adequate spacing for display boards on walls</li> </ul>	<ul style="list-style-type: none"> <li>● Activate existing satellite television capabilities to allow existing TV to display news feeds during an emergency. Add satellite television systems to enhance capture of multiple news feeds.</li> <li>● Utilize existing space for display boards and district-level maps to be able to synthesize information from damage assessments, situation reports, and objectives through Incident Action Plans.</li> <li>● Consider purchase of Resource Tracking System T-Card rack (to be reviewed in Module 2) for resource visualization and decision support.</li> </ul>
Ease of Building Access/Function	<ul style="list-style-type: none"> <li>● No elevator to second floor EOC</li> <li>● Challenging for those with disabilities to walk upstairs to EOC</li> <li>● EOC Signage on front of building</li> <li>● No signage for emergency exits</li> <li>● No air conditioning/ventilation system</li> <li>● Acoustics poor in conference room</li> <li>● Oxygen supplies on site – consider signage for hazardous materials as well as review of safety and security of hazards materials</li> </ul>	<ul style="list-style-type: none"> <li>● Create and post signage for exits and safety protocols to follow if the EOC itself was experiencing an emergency</li> <li>● Consider installation of stairway rails to support ease of access</li> <li>● Use portable fans/window fans if it is not possible to install an air conditioning system</li> <li>● Add additional DarMAERT EOC signage</li> </ul>



EOC Characteristic	Observation	Initial Recommendation
Layout and Spacing	<ul style="list-style-type: none"> <li>• Main EOC room estimated at 9 ft x 6 meters (54 square meters) and considered functional for high level command staff meetings for DarMAERT members</li> <li>• A second attached room 4.5 x 6 ft (27 square meters) for command staff and meetings (Disaster Management Department property)</li> <li>• Seating at conference room limited to 30</li> <li>• Parking lot only accommodates 5-6 vehicles</li> <li>• Operational rooms adequate for only 1 -2 staff</li> <li>• No kitchen area for serving meals (as property of EOC); it was noted that canteen may be present for the Fire Station</li> <li>• No sleeping quarters for overnight shifts</li> </ul>	<ul style="list-style-type: none"> <li>• Continue with DarMAERT's plan to utilize additional neighboring space to create break-out areas for Emergency Support Functions, a kitchen/ tearoom/ meal serving area, and potentially sleeping quarters/ rest area.</li> <li>• Create space blueprint to plan for functional working spaces for Command Staff, General Staff, Emergency Support Functions, and high-level officials</li> <li>• Discuss parking overflow options with other government agencies, or potentially utilize football field/helicopter pad for overflow parking</li> </ul>
Geographic Placement of EOC	<ul style="list-style-type: none"> <li>• Convenient to Mayor's Office (15 min drive)</li> <li>• Centrally located</li> <li>• Flood source nearby - floodwaters 50 meters away in recent flood event</li> <li>• High traffic area</li> <li>• There was access to rapid transit</li> </ul>	<ul style="list-style-type: none"> <li>• Maintain awareness of proximity of flood source to EOC</li> <li>• Prioritize monitoring of local flooding by Fire Department and its potential impact to nearby road closures and any impact of flooding to EOC itself</li> <li>• Create emergency plan to safely evacuate EOC staff in a flood event</li> </ul>

EOC Characteristic	Observation	Initial Recommendation
EOC Resilience to Hazards <sup>15</sup>	<ul style="list-style-type: none"> <li>• EOC located on second floor (elevated for flood waters)</li> <li>• Communications system on first floor (vulnerable to flood waters)</li> <li>• Helicopter landing pad/football field vulnerable to ponding of water during flood/high rain event</li> </ul>	<ul style="list-style-type: none"> <li>• Consider relocating DarMAERT radio equipment from the first floor (Fire Station) to second floor (EOC) or to another area of fire station on second floor. Elevating communications equipment is a mitigation measure in case of flood event.</li> <li>• Conduct routine maintenance or retrofit on building windows and roof to ensure no leaks or external wind damage during severe weather events</li> <li>• Review use of football field/helipad including helipad safety protocols and ensure that helicopter operations or overflow parking can occur during severe rain events</li> </ul>
<b>EOC Operations and Management Protocols</b>		
Operations	<ul style="list-style-type: none"> <li>• Apparent high capacity in terms of knowledge of implementation of response operations at incident control level (DarMAERT's definition of "operational")</li> <li>• Emerging capacity in terms of design and coordination of response operations at EOC level (DarMAERT's definition of "tactical").</li> </ul>	<ul style="list-style-type: none"> <li>• Update DarMAERT Emergency Response Plan through the delivery of the TED Program.</li> <li>• Annex Standard Operating Procedures to the Emergency Response Plan/Basic Plan</li> </ul>

<sup>15</sup> It is noted that a thorough analysis of the whole facility is recommended prior decision-making related to strengthening the facility's resilience to hazards.

EOC Characteristic	Observation	Initial Recommendation
Management Protocols	<ul style="list-style-type: none"> <li>EOC management protocols for business processes to govern the EOC operations were limited, not in place, or currently do not exist.</li> </ul>	<ul style="list-style-type: none"> <li>Through the delivery of the TED Program, create templates for EOC in order to operationalize key processes, including activation and de-activation protocols, damage assessment forms, situation report formats, and formal call down lists</li> <li>Through the delivery of the TED Program, create Standard Operating Procedures for key EOC positions based on the Incident Command System</li> </ul>

## Annex 3: Full International Standards Checklist of EOC Physical Characteristics

This checklist will be used regularly during assessment of the EOC physical characteristics. The outcome of the assessment will be used for planning and improvement of the EOC.

EOC Physical Criteria	Yes	No	Comment	DarMAERT Comment
<b>1. Facility Features</b>				
<i><b>Facility Features</b></i> examines the physical features of EOC facilities: e.g. sitting, structure, available space. EOC spaces to consider are: an operations area, conference rooms, communications center, secure communications room and multi-use space. Multi-use space is space that is not dedicated to EOC operations but can quickly be made available to support EOC requirements for additional space during major disaster or surge situations.				
Is there an EOC?	Yes		DarMAERT EOC is co-located with the Ilala Fire Station. The facility is currently inadequately equipped due to lack of allocated budget for EOC equipment.	
Is the EOC located in an urban area?	Yes		EOC is centrally located. Access to rapid transit is nearby.	
Is the EOC in the proximity of a government center (i.e., city hall, county courthouse, state capitol, etc.)?	Yes		It is a convenient drive to/from the Mayor's Office (i.e. 15 minutes) and from the Regional Commissioner's Office (i.e. 7 minutes)	

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Do government executives/key officials have rapid access to the EOC?	Yes		EOC is 15 minutes away from major municipal offices	
Are additional government personnel readily available to augment the EOC should the emergency escalate beyond the capability of the on-duty EOC team?	Yes		The current structure of DarMAERT more than exceeds current EOC space.	
Is the EOC in a centrally located site allowing rapid response to all parts of the jurisdiction?	Yes		EOC is in a central location in Ilala District	
Is the EOC in an area that avoids congestion (i.e. transportation chokepoints such as inadequate thoroughfares, bridges, etc.) or debris from collapsing buildings?		No	EOC is located in a high traffic area.	
Is the EOC located in a facility that has structural integrity?	Yes		Facility has strong concrete frame to provide resilience to wind hazards	
Is the EOC located in an area where it can quickly be secured?	Yes		The EOC has central location in the event of security emergency	

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
<p>Is the EOC located in a known high-risk area (e.g. floods, earthquakes, nuclear power plant, Hazardous Material (HAZMAT) sites, etc.)?</p> <p>If yes, explain. Are there any plans to mitigate risk?</p>	Yes		<p>There is flood source nearby, e.g. floodwaters 50 meters away in recent flood event.</p> <p>There are no current plans to mitigate risk.</p>	
<p>Is the EOC located near an adequate road network for ease of access?</p>	Yes		<p>There is adequate road network but vulnerable to congestion and potential flooding.</p>	
<p>Is the building housing the EOC close to or set back from a tree line?</p>	Yes		<p>There are no hazards from trees identified.</p>	
<p>Does the building/shelter have adequate parking?</p> <p>Is the parking available in a parking lot or garage (above or below ground)?</p>		No	<p>Parking lot accommodates only 5-6 vehicles.</p> <p>The parking lot is located above ground.</p>	
<p>Does the building/shelter have space to accommodate a helicopter landing pad?</p> <p>Is the surrounding area sufficiently clear of obstructions to allow a helicopter to approach and land?</p>	Yes		<p>Helicopter pad has dual use as soccer field.</p> <p>Helicopter pad is vulnerable to ponding of water during flood events.</p>	

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Is the EOC in a government owned or leased facility?	Yes		Government-owned facility	
Does the EOC occupy its own building?		No	Fire Station is located at the first floor of the same building.	
Is the EOC space dedicated (set aside and configured for EOC use only)?	Yes		Entire two (2) rooms are dedicated to the DarMAERT EOC.	
Is the EOC one large room?		No	Currently, there are two rooms for the EOC.	
Does the EOC have space, whether in one large room or complex of rooms, for an operations area (to perform emergency response and management functions), conference/media room (for meetings and press briefings), communications room (for centralized facsimiles, radios and video teleconferencing [VTC]) and secure communications (secure voice, facsimile and VTC)?		No	Albeit minimal, there is workable space in terms of square meters, however, a layout redesign is required to fully fulfill these functions.	
Does the EOC have a dedicated Operations Room? Is the space adequate to support the emergency response and EOC staff?	Yes		A small Operations Room is identified. Current restructure is proposed.	

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Does the EOC have a dedicated conference/media room(s)? Is the conference room size adequate to support meetings and media briefings? Can the conference room be physically separated/isolated from the operations area so that media briefings do not interfere with on-going operations?		No	No current Media room or Joint Information Center (JIC) in the facility.	
Does the EOC have a secure communications room? Is the space adequate to support cleared EOC staff and secure communications requirements?		No	Secure communications occurs in the EOC Manager's Office.	
Does the EOC have designated multi-use space? Is the size of this space adequate to support expanded operations? Is the space readily available?		No	Current planning assumption is that the only area available is the area currently corresponding to the identified two rooms.	
Can the EOC support augmenting staff in a major disaster or surge situation?		No	Total available capacity is no more than 30 people in the current EOC.	
If not, can it be reconfigured or are there plans to provide the necessary space?		No	Current planning assumption is to stay within the confines of current space (2 rooms).	



<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Is there an Alternate EOC?		No	There is no alternative space at the present time.	
<b>2. Survivability</b>				
<i><b>Survivability</b></i> - sustain the effects of a realized potential risk and continue operations from the EOC or a fully-capable alternate location (e.g. have an alternate EOC that can be activated and used if the primary is destroyed, damaged or not accessible).				
Is the EOC located in a known high-risk area (e.g., floods, earthquakes, nuclear power plant, Hazardous Material (HAZMAT) sites, etc)?	Yes		Flooding was reported as near as 50 meters away by Fire Officials during a major flood event in 2018.	
Can the EOC survive the effects of relevant risks (e.g., natural and manmade hazards)?	Yes		The EOC is elevated by its location on the second floor of the building. It has a strong building envelope.	
Does the EOC have special structural capabilities that improve its survivability?		No	Provision of redundant power supply (generator) and elevation of DarMAERT VHF/Radio Communications system, which is currently on the first floor are recommended.	

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Does the EOC have a collective protection system for chemical, biological, radiological or nuclear (CBRN) agents?		No		
Does the EOC have protection from blast effects?		No	It is recommended that thorough analysis prior decision-making investments in the EOC also consider other forms of risks/vulnerabilities, including, but not limited, to blast effects and the other items listed in this document.	
Is the EOC above the ground floor?	Yes			
<b>3. Security</b>				
<b>Security</b> - guard against potential risks and protect operations from the unauthorized disclosure of sensitive information (e.g., have sufficient security and structural integrity to protect the facility, its occupants and communications equipment and systems from relevant threats and hazards).				
<b>a. Facility Security</b>				

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Are physical security measures (barriers, security cameras, etc.) presently used in the EOC and are these existing security features adequate?	Yes		The area is fenced with a wall, situated in the Fire Brigade where security is available 24 hrs. However, No security cameras Partial security system identified.	
Is a badge or card-swipe system, or any other accountability system in use to control facility access? Is it adequate to control access to the facility? Is it adequate to control access within the facility?		No	No badging or accountability system currently in place.	
Does appropriate staff have 24-hour access to the facility?	Yes		This is applicable to DarMAERT Core Group.	
Can security capabilities be increased commensurate with higher threat levels (e.g., additional barriers, increased surveillance, additional guards)?	Yes			
Can areas where classified and/or unclassified but sensitive information is discussed be isolated from unauthorized/ uncleared individuals?		No	Proposed re-design assigns an EOC Manager's Office.	

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Does the EOC have an existing secure communications area/room? Is the size (square meters) of the room adequate?		No	Proposed re-design assigns an EOC Manager's Office.	
How is access to an existing secure communications area controlled? Are existing controls adequate?		No	Proposed re-design assigns an EOC Manager's Office with a security desk.	
<b>b. Communications/ Networks Security</b>				
Do Local Area Networks (LAN) used in support of emergency operations have adequate protection against cyberattack (e.g. unauthorized access, denial of service or malicious code)? If not, what capabilities are needed?	YES		This is out of the TED scope, and requires further technical Information and Communications Technology (ICT) assessment. ICT assessment will be a sub-chapter of the detailed analysis by the World Bank through another project.	
Do state Wide Area Networks (WAN) used in support of emergency operations have adequate protection against cyberattack (e.g., unauthorized access, denial of service, or malicious code)? If not, what capabilities are needed?				

EOC Physical Criteria	Yes	No	Comment	DarMAERT Comment
Does the EOC have secure voice capability? If so, is it adequate to support you emergency operations needs?			This is out of the TED scope, and requires further technical Information and Communications Technology (ICT) assessment. ICT assessment will be a sub-chapter of the detailed analysis by the World Bank through another project.	
Do non-secure telephones have a privacy feature?				
Do you have a secure facsimile capability? If so, is it adequate to support your emergency operations needs?				
Are radio communications protected (i.e., encrypted or have privacy features)?				
4. Sustainability				
Sustainability - support operations for extended durations (e.g. be able to sustain operations 24/7 during all emergency situations without interruption; to the extent practical, be located in a place that is not a high-risk area for known hazards, such as flooding and other natural hazards, nuclear power plants, hazardous material sites, etc.).				
a. Facility Sustainability				

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Can the EOC support operations 24-hours a day/7 day a week for an extended period of time? Are operational and administrative supplies adequate to sustain operations (e.g., food, water, fuel for backup generators, paper products, office supplies, kitchen, etc.)?		No	Kitchen/ Tearoom and male/female designated bedding areas/ rest areas dedicated as per needs by DarMAERT recommended.	
Does the EOC have backup power? (Backup power typically refers to generator power.)		No	Provision of back-up generator recommended.	
Does the EOC/ Alternate EOC have an uninterruptible power supply (UPS)? (UPS units typically use batteries to provide power for a limited duration; e.g., 10-20 minutes depending on the load.) If yes, what systems/functions does the UPS support? Is the duration of the UPS adequate to support these systems/functions until the backup power comes online?		No	Provision of Uninterrupted Power Supply (UPS) recommended.	
Are Heating, Ventilation, and Air Conditioning (HVAC) systems centrally (building-wide) managed?		No	HVAC capabilities are minimal.	
Are HVAC systems available and controllable 24-hours a day, seven days a week (24/7)?		No	HVAC capabilities are minimal.	

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Does the EOC have access to support areas (e.g., file rooms, server sites and the like)?		No	There is minimal spacing available.	
Are there any special constraints that must be met to sustain operations? Special access needs?	Yes		Disability access and signage are not present.	
<b>b. Communications/Networks Sustainability</b>				
Is the number of telephones, secure or non-secure, adequate for the EOC to conduct emergency response and management operations?			This is out of the TED scope and requires further technical Information and Communications Technology (ICT) assessment.	
Are telephones connected to an in-house Private Branch Exchange (PBX)?				
Are telephones connected directly to a local commercial carrier (i.e. draw dial tone from the local switch rather than from the PBX)? (These telephones are just like those found in a home or office. The advantage is that if the EOC/ Alternate EOC loses power to the PBX, telephones connected				

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
directly to the dial central office will continue to function.)			This is out of the TED scope and requires further technical Information and Communications Technology (ICT) assessment.	
Is the number of facsimiles, secure and non-secure, adequate to conduct emergency response operations?				
Does the EOC have dedicated transmit and receive facsimiles?				
Does the EOC have a secure facsimile capability?				
Is the number of printers adequate for the EOC to conduct emergency response operations?		No	Printers included in proposed equipment list.	
<b>5. Interoperability</b>				



<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
<b>Interoperability</b> – does the EOC share common principles of operations and exchange routine and time-sensitive information with local jurisdictions, Emergency Support Functions, and national partners?				
<b>a. Communications Interoperability</b>				
Does the EOC have a requirement to monitor the communications of key emergency services (e.g. police, fire, emergency medical services (EMS), HAZMAT, and public works)? Is there a requirement to monitor the communications of other services? If yes, does the capability exist and is it adequate?	Yes		DarMAERT has secure VHF/ UHF band, but it is unclear if other communications are monitored in an EOC setting.	
Does the EOC have a requirement to establish an emergency communications network that includes the key emergency services and local EOCs/jurisdictions? If yes, does the capability exist and is it adequate?		NO	Need for establishment of emergency communication network.	
If a requirement exists, can the EOC communicate with the following entities:			Does not exist – For establishment	

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Local EOCs			Currently unclear. Question to be posted for DarMAERT.	
National EOC			Currently unclear. Question to be posted for DarMAERT.	
Regional Administrative Secretary (RAS)			Currently unclear. Question to be posted for DarMAERT.	
EOC of neighboring jurisdictions?			Currently unclear. Question to be posted for DarMAERT.	
Operations centers of other agencies (i.e. public health)?			Plan to map the existing Agency EOCs in the region	
Incident Commander or incident site command post?	YES		Whenever an incident occurs in the region the EOC is activated to get information from the On the scene Commander.	
Operations centers of regional and local airport, highway, port, and waterway authorities; hospitals and ambulance service providers; nuclear power plants; dams; private sector utilities (power, telephone, sewerage, and water) and chemical companies?			Currently unclear. Question to be posted for DarMAERT.	

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Are the EOC communications means adequate to satisfy communications requirements? (Consider radios, telephones, cell phones, available frequency spectrum, and other issues.)		NO	This is out of the TED scope and requires further technical Information and Communications Technology (ICT) assessment.	
<b>b. Interoperability of Procedures</b>				
Do the State and Local Government EOCs have common operations, reporting, and communications procedures that will be used during the response to and management of an All Hazards event?		No*	This is an expected outcome of the TED program, Modules 1-4.	
If the EOC has a requirement to exchange information with local EOCs/jurisdictions and key emergency services (e.g., police, fire, EMS, HAZMAT, and public works), are there procedures/checklists in place to facilitate the exchange?		No*	This is an expected outcome of the TED program, Modules 1-4.	
If required, are scheduled reports assembled and disseminated?		No*	This is an expected outcome of the TED program, Modules 1-4.	

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
<b>c. Interoperability of Trainings</b>				
Does the EOC conduct routine, recurring, or periodic joint communications training to exercise the communications capabilities that will be used during the response to and management of an All Hazards event?		No*	This is an expected outcome of the TED program, Modules 1-4.	
If conducted, are the results of joint communications training maintained in a "lessons learned" document and used to improve communications operations? Are the results also used to identify communications deficiencies and develop solutions that correct the deficiencies and improve communications capabilities?		No*	This is an expected outcome of the TED program, Modules 1-4.	
Does the EOC conduct routine, recurring, or periodic joint training exercises to practice, test, and refine their common operations, reporting, and communications procedures?		No*	This is an expected outcome of the TED program, Modules 1-4.	

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
If conducted, are the results of joint training maintained in a "lessons learned" document and used to improve common procedures?		No*	This is an expected outcome of the TED program, Modules 1-4.	
Are actual experiences used to validate existing or create new common procedures?		No*	This is an expected outcome of the TED program, Modules 1-4.	
<b>6. Flexibility</b>				
<b><i>Flexibility</i></b> - scale operations and adapt operational pace to the All Hazards event (e.g., have sufficient space, equipment, furniture, administrative supplies, and the like available to satisfy mission requirements).				
<b>a. Flexibility of Facility - Primary EOC</b>				
Is space dedicated for an EOC? If not, does the EOC occupy space within another organization's facility (e.g. State or local police headquarters, emergency medical services facility, commercial building)?	Yes		DarMAERT EOC is located within Ilala Fire Station	
		No		

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Whether dedicated or shared, is the square meters available for the EOC adequate to conduct emergency response operations?			Spacing is very tight for activation, but currently drafting design specifications based on current layout.	
Is the EOC operational only when emergency response and management operations are being conducted? Or, is the EOC operational 24/7 (staff and capabilities are present and active) whether or not emergency response operations are being conducted?	Yes			
Are there activation, layout, and setup procedures for the EOC?		No*	This is an expected outcome of the TED program, Modules 1-4.	
Can EOC activation and operations be tailored to the scale of emergency response activities? (For example, a small-scale event might require the activation of fewer staff and capabilities, and the conduct of limited emergency response operations; a large-scale event, the activation of all staff and capabilities, and the conduct of extensive emergency response operations.)		No*	Scaling to activation levels is still a question. DarMAERT is limited by physical space requirements, thereby, requiring virtual coordination.	

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Have the conditions that would cause the EOC to be relocated been identified? Are there procedures for relocating from the EOC?		No	Evacuation/flood evacuation protocol for the EOC is recommended especially for flood hazards	
Are EOC activation and relocation exercises held periodically? Is the level of participation by member agencies sufficient to ensure an efficient and timely activation during actual events? Do participants include key personnel assigned to the EOC?		No*	This is an expected outcome of the TED program, Modules 1-4.	
Is there a dedicated conference/media room in the general vicinity of the EOC? Is the area adequate?		No	This is included in the recommendations for the physical layout redesign.	
Is there multi-use space available in the general vicinity of the EOC? Is the area adequate? (Multi-use space is usually an office, administrative, or conference area that is used for day-to-day functions and can be made available to support emergency response and management operations. Typically, the day-to-day staff are displaced to another location.)	YES		DarMAERT indicated that there are vacant government facilities that may have multi-use space. The day-to-day staffs are available for daily EOC Operations	

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
<b>b. Flexibility of Communications/Networks</b>				
Is the number of computers available in the EOC and any multi-use space adequate to support emergency response operations?	YES			
Is the number of servers adequate to support emergency response operations?			Servers and telephone system are out of the TED scope and requires further technical Information and Communications Technology (ICT) assessment.  TV and projector recommended in equipment list.  Telephone system is out of the TED scope and requires further technical	
Is the number of telephones, both secure and non-secure, available in the EOC and any multi-use space adequate to support emergency response operations?				
Do the EOC and any multi-use space have telephones that are connected to a local dial central office?				
Do any telephones have a:				
Recording capability?				



<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Caller ID capability?			Information and Communications Technology (ICT) assessment.	
Voice conferencing capability?				
Is the number of printers available in the EOC and any multi-use space adequate to support emergency response operations?		No	Printers and copier recommended in equipment list.	
Is the number of facsimiles available in the EOC and any multi-use space adequate to support emergency response operations?		No		
Do the EOC and any multi-use space have the capability to display video? If yes, do they also have the capability to distribute audio associated with the video display?		No		
Does the EOC and any multi-use space have a video teleconferencing (VTC) capability?		No	This is out of the TED scope and requires further technical Information and Communications Technology (ICT) assessment.	
		No	This is recommended especially for the EOC Manager's Office.	
		No	Intercom system also recommended.	

<b>EOC Physical Criteria</b>	<b>Yes</b>	<b>No</b>	<b>Comment</b>	<b>DarMAERT Comment</b>
Does the EOC and any multi-use space have the capability to receive public (intercom) announcements?				
Can the telecommunications capability be configured to support the scale of emergency response and management activities?			This is out of the TED scope and requires further technical Information and Communications Technology (ICT) assessment.	



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