



# Incident Potential Index Model Complimenting Malaysia Disaster Management Environment

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## Abstract

Disaster management is a process cycle of disaster prevention, preparedness, response, and recovery. The revised Malaysia disaster management policy, MNSC 20 was published in compliance with international disaster management frameworks. Unfortunately, MNSC 20 did not elucidate stages before the district level of disaster hence, a model of an incident potential index needs to be developed and defined. By utilizing content validity method in analysing MNSC 20, lead responding agency documentation and several disaster management plans developed and endorsed by the lead responding agency, a model of Incident Potential Index Complimenting MNSC 20 was introduced. The model shows that there were three (3) Tiers needed to be considered by community members before the activation of MNSC 20. This model is considered effective as its seemingly dovetails the response and recovery efforts of the community members with the lead responding agency in Malaysia. By implementing the model, it is believed that community disaster plan, including the oil and gas industry, can be standardized in defining levels of disasters which indirectly compliment the MNSC 20 when activated.

**Keywords:** Incident Potential Index, Disaster Policy, Level of Disaster, MNSC 20

## 1. Introduction

Disaster management comprises the process cycles of preventing high losses from disaster impact, preparing for disaster, response process during disaster and recovery from disaster [1], [2]. Following the development and the implementation of international disaster management framework, namely the Hyogo Framework for Action (HFA) 2005-2015 and Asia Pacific Economic Cooperation Emergency Preparedness Working Group (APEC-EPWG), the revised version of MNSC 20 was published [3]. The revised MNSC 20 contain eight (8) significant changes towards the older directives complimenting both international framework [3].

A community is a group of people living in the same place or area. A community may consist of businesses, industrial area, housing area, public gathering area, schools, universities and many more. A community need to be prepared to respond to during disasters and in achieving so, standardization is important in developing each of the community disaster management program [1], [4]. It is the researcher understanding that in standardizing disaster management program in Malaysia, especially at each community member, a level of disaster need to be properly defined as introduced in MNSC 20 [5]. It is the purpose of this paper to provide understanding on disaster management level in Malaysia and develop an incident potential index or also known as progression level of disaster before the activation of MNSC 20 as MNSC 20 did not elucidate stages before the district level of disaster.

## 2. Materials and Methods

Understanding disaster management in Malaysia and developing an incident potential index require a systematic method for reviewing or assessing documents. These materials were then validated by using tool validity which refers to the degree in the study tool that is truly measuring what it is intended to measure in achieving study success [6]. Developing an incident potential index were subjected to the content validity method. Content validity method was used because document analysis requires the data to be examined and interpreted in order to kindle the meaning, gain understanding, and develop observational knowledge [6], [7]. Content validity is defined as validation of research tool based on credible resources [6]. Hence, for the purpose of this study, Procedures in Applying Certificate of Completion and Compliance (CCC) from Fire and Rescue Department of Malaysia (FRDM) [8], MNSC 20 [5], and several developed disaster management plans in Malaysia [9] were analysed to understand the overall disaster level in terms of a unified command structure and resources needed during disaster [8], [10], [11]. Model developed were validated using face validity which is defined as a test that appears to be valid or accepted by the researcher or field experts [6]. Six (6) disaster management experts went through and discussed the developed model and were confident with the models proposed. There are possibility of experts to take their knowledge for granted as well as having different interpretations of the model. However,

this can be ignored as the model are substantiate by the needs of supporting governance for MNSC 20 [1]□.

### 3. Results and Discussion

Implementation of disaster management in a country is unique due to each country unique government set up and structure [12], [13]. In implementing disaster management in Malaysia, the incipient level plan for disaster need to be developed before the activation of MNSC 20 and at the same time must compliment the MNSC 20 [13]□. Standardized disaster management plan needs a standardized level of disaster hence, understanding the MNSC 20 level of disaster is pertinent.

#### 3.1 Malaysia National Security Council Directive No. 20 (MNSC 20), Policy and Mechanism of Disaster Management in Malaysia

MNSC 20 effectiveness are measured by its capability to develop a unified command structure hence, the objective of MNSC 20 is summarized as [5]□:

- To establish a management mechanism in managing disaster
- To determine the roles and responsibilities of government agencies, statutory bodies, voluntary bodies and private sector to manage disaster on land
- To reduce casualties and minimize the damages towards assets and preserving the environment
- To coordinate relief and rehabilitation of victims in returning to normalcy

There are three (3) levels of emergency defined in MNSC 20 where each disaster has its own scale of complexity, authority, and expertise. During disasters, the PKTK (On Scene Command Post) will be set up in the affected area, followed by PKOB (Disaster Operation Control Centre) which act as a coordination center for the disaster. PKTK and PKOB are led by appointed individual as stated in MNSC 20. Disasters are managed by either District, States or Federal Disaster Management and Relief Committee (DMRC) based on three (3) level of disaster [5]□ summarized as following Table 1.

**Table 1:** In-charge individual and committee based on MNSC 20 Level of disaster

Level	PKTK	PKOB	DMRC
1	OCPD	District Officer	District
2	State Police Chief	State Secretary	State
3	KDN/KA Director	Prime Minister or appointed minister	Federal

MNSC 20 Level 1 (District) disaster is a local incident within the control and does not have the potential to spread. Operation Commander is headed by Officer in Charge of Police District (OCPD) and the Disaster Management Relief Committee is headed by District Officer. Managing the disaster is not complex with minimum loss and casualty. The District Level Authority is capable of controlling such incidents through district level agencies without or with limited assistance from outside.

The second level in MNSC 20 is a state level disaster. Level 2 (State) disasters are greater serious incidents, covering a wide area or exceeding two (2) districts with a potential to spread. At this stage, Operation Commander is headed by States Chief Police Officer and Disaster Management Relief Committee is headed by States Secretary. There are possibilities of mass casualty and loss while being more complex than Level I Disaster. In this level, the State Level Authority is capable of controlling such incidents with or without limited help from outside.

The last level in MNSC 20 is a federal level disaster. Level 3 (Federal) disasters are more complex in nature and affects a wide area of more than two (2) states. Operation Commander is headed by Director of Internal Security and Public Order of Royal Malaysian Police Force and Disaster Committee is headed by the Prime Minister or Minister appointed by him. The incidents could be handled by the Central Authority with or without foreign help.

Although the level of disaster in MNSC 20 is classified based on district, states and federal level of disaster, the determination factors are not based on the number of districts or states involved in a disaster. Officer-in-charge at PKTK, PKOB or even the first responder arrived at disaster sites may jointly discussed with other involved agency to activate any level of disaster based on six (6) determination factors outlined by MNSC 20, which is [5]□:

- Complexity and magnitude of the disaster
- Loss and Damage caused by the disaster
- Resource and logistical capability needed in managing the disaster
- Expertise or professionals needed in managing the disaster
- Local and international assistance needed

- Estimated response duration needed in managing the disaster

Eventhough the determination factors outlined by MNSC 20 is general, the author believed that this is advantageous as it will give the lead responding agency the freedom in determining the level of disaster based on their expertise rather than a rigid value or numbers.

#### 3.2 Model of Incident Potential Index Complimenting Malaysia Disaster Management Policy

In standardizing disaster management plan in Malaysia, the level of disaster has been defined, especially before the activation of Level 1, MNSC 20. Figure 1 modeled the disaster progression level, which started from initiation of an incident to the activation of MNSC 20 Level 3. Each level of disaster indicates the unified command used, the committee involved and resources needed in managing it.

When an incident happens, it is the responsibility of the owner of the area where the incident happens to manage the incident, especially if it is an incipient stage. Tier 1 is an incipient stage where there exists a minimal threat to life, property, and the environment. Normally the Emergency Response Team (ERT) is more than capable to manage the incident and if needed will set up staging area just for the purpose of managing the incident. The committee and resources in managing the incident remain the responsibility of the organization itself.

Escalation of the incident to a more severe situation will lead to the activation of Tier 2. Tier 2 is an emergency situation where there is a threat to life, property, and the environment. At this level, the Emergency Management Team (EMT) needs to be activated by the organization in order to manage the overall emergency and operating from an Emergency Operation Centre (EOC). During Tier 2, the related authority having jurisdiction (AHJ) (Police, FRDM, etc.) will be informed and their involvement may upgrade the staging area to command post where the overall site operations will be led by the AHJ. The ERT will act as support to the AHJ. In Tier 2, the organization itself will be the responsible committee which includes supplying resources in managing the disaster.

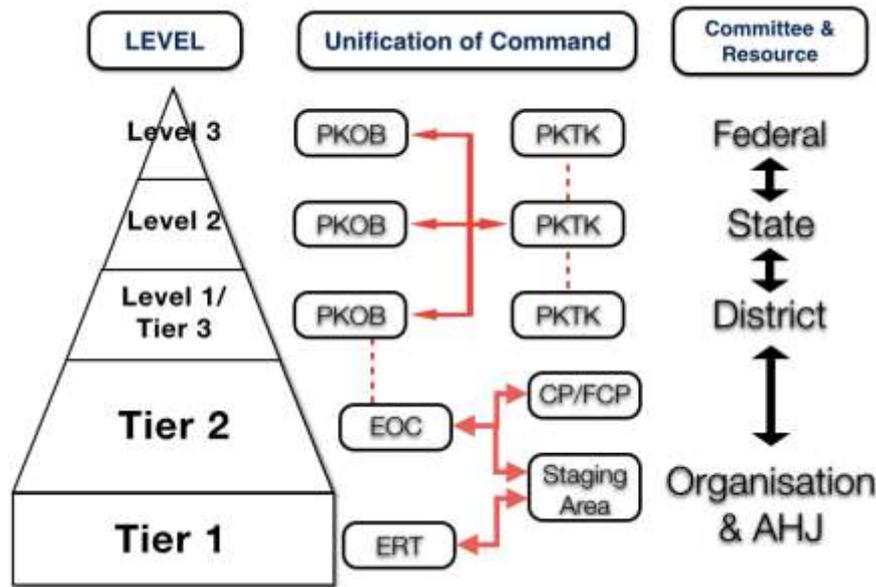


Figure 1: Model of Malaysia Incident Potential Index.

Escalation of Tier 2 emergency will lead to a Tier 3 disaster. Tier 3 is usually beyond the capability of the organization and need AHJ to assist them in managing the incident. Tier 3 disaster has the possibility of the activation of Level 1 of MNSC 20 where will require the intervention from the district level, where PKTK will be set up in the affected area. The current command post will be integrated into PKTK and the current EOC will be working together with District-PKOB. District-DMRC will be activated whereby they will station at District-PKOB to assist PKTK in managing the disaster (unification of command). The organization is still the responsible committee for the incident site, but the operations are the responsibility of the District-DMRC. Most resources for the operations is supplied at the district level and supported by the organization itself.

Jointly, agencies at PKTK may decide if there is a need for other states to be involved. If assistance is needed, with the agreement from District-PKOB Level 2 of MNSC 20 will be activated. At Level 2, States-DMRC will be activated and stationed at States-PKOB to assist current PKTK in managing the disaster. In this situation, EOC and District-PKOB will not dissolve (change of command), but they remain in assisting the states PKOB in managing the disaster (chain of command)[5].

Escalation of the situation may require the PKTK to activate MNSC 20 Level 3 with the agreement from States-PKOB. In Level 3 disaster, Federal-DMRC will be activated and stationed at Federal-PKOB. Federal-PKOB will work with States-PKOB and District-PKOB in assisting current PKTK in managing the disaster. At the same time, the Federal-PKOB will act as liaison to the international community for international assistance.

Numbers of PKTK will remain to be one (1), even Federal-PKOB and States-PKOB are activated as there are no needs to have a multiple On Scene Command Post for one disaster area. However, there are possibilities of disaster happening at multiple location or district at the same time, so another PKTK may be activated depends on the PKOB decision.

There are many definitions of disaster and defining disaster still remain as issues, but mostly, disaster is defined based consequences<sup>14</sup>. Hence, it is ideal to define disaster based on its characteristic<sup>15</sup>. This model emphasizes that Tier 1 as incipient, Tier 2 as emergency and Tier 3 as disasters, but the assessment for Tier's falls under the organization themselves. On the other hand, the assessment of the level of disaster relies on the district, state or

federal authority depending on the scale of the disaster especially when assistant from higher authorities is needed. The escalation in the level of disaster is determined based on the disaster complexity and magnitude; damage and losses; finance, manpower, and logistic capability; expertise needed and assistance needed<sup>5</sup>. With this level of settings, it is the researcher's opinion that any Tier or level of disaster can be activated without following the sequences from incipient stages (Tier 1) to federal level (Level 3) depending on the severity of the disaster itself if regulated.

#### 4. Conclusion

Defining the level of disaster will determine the level of assistance and level of authority needed in effectively managing disaster as it occurs. The three (3) Tier's as elaborated earlier can assist community members in properly managing their response effort as disasters happen and as needed to cooperate with AHJ as disaster escalated to beyond the capability of the organization. Each community member's disaster management plan needs to properly determine their level of disaster as it will eventually ease the co-operation between community and AHJ when disasters happen due to the fact of standardization and compliance towards the MNSC 20. The implication of this study is that by implementing the model, it is believed that community disaster plan can be standardized in defining levels of disasters which indirectly will compliment and ensure smooth chain of command<sup>2</sup> when MNSC 20 is activated.

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