PETRONAS TECHNICAL STANDARDS

MEDICAL EMERGENCY RESPONSE

PTS 18.15.01
July 2016

FOREWORD

PETRONAS Technical Standards (PTS) has been developed based on the accumulated knowledge, experience and best practices of the PETRONAS group supplementing National and International standards where appropriate. The key objective of PTS is to ensure standard technical practice across the PETRONAS group.

Compliance to PTS is compulsory for PETRONAS-operated facilities and Joint Ventures (JVs) where PETRONAS has more than fifty percent (50%) shareholding and/or operational control, and includes all phases of work activities.

Contractors/manufacturers/suppliers who use PTS are solely responsible in ensuring the quality of work, goods and services meet the required design and engineering standards. In the case where specific requirements are not covered in the PTS, it is the responsibility of the Contractors/manufacturers/suppliers to propose other proven or internationally established standards or practices of the same level of quality and integrity as reflected in the PTS.

In issuing and making the PTS available, PETRONAS is not making any warranty on the accuracy or completeness of the information contained in PTS. The Contractors/manufacturers/suppliers shall ensure accuracy and completeness of the PTS used for the intended design and engineering requirement and shall inform the Owner for any conflicting requirement with other international codes and technical standards before start of any work.

The PTS shall be used exclusively for the authorised purpose. The users shall arrange for PTS to be kept in safe custody and shall ensure its secrecy is maintained and provide satisfactory information to PETRONAS that this requirement is met.

ANNOUNCEMENT

Please be informed that the entire PTS inventory is currently undergoing transformation exercise from 2013 - 2015 which includes revision to numbering system, format and content. As part of this change, the PTS numbering system has been revised to 6-digit numbers and drawings, forms and requisition to 7-digit numbers. All newly revised PTS will adopt this new numbering system, and where required make reference to other PTS in its revised numbering to ensure consistency. Users are requested to refer to PTS 00.01.01 (Index to PTS) for mapping between old and revised PTS numbers for clarity. For further inquiries, contact PTS administrator at ptshelpdesk@petronas.com.my

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1.0 INTRODUCTION

PTS 60.0101 HSE Management System (Reference 1) requires PETRONAS-operated facilities and Joint Ventures (JVs) to have emergency response procedures in place, including plans for medical emergencies.

The PTS on Medical Emergency Response describes how PETRONAS-operated facilities and Joint Ventures (JVs) should draw up its Medical Emergency Response Plan (MERP) as part of its overall Site Emergency Response Plan/Management. MERP forms part of the 'Recovery' step of the Hazards and Effects Management Process (HEMP) in HSE Management System.

MERP is a written document that should be fit-for-purpose for implementation at the worksites and developed based on MER Stage Response requirements/standards using risk-based approach by taking into account all foreseeable medical emergency scenarios based on the risk presence, individual/multiple casualties, specific needs of the work activities, general situation of the country and available MER resources to respond to medical emergencies. A site-specific MERP needs to be developed prior to mobilization/project/operation and regularly reviewed and exercised to ensure they remain effective and fit-for-purpose.

MERP is crucial to be developed and implemented in order to save lives and minimise the consequences of injury or acute illness (e.g. heart attack, asthma, etc.) occurring at the work place and, as far as is practicable, to assist their full recovery.

This PTS provides the minimum requirements for the Medical Emergency Response in PETRONAS workplaces and premises. It is developed based on industrial best practices, to ensure uniformity of practices throughout PETRONAS-operated facilities and JVs and the preparedness to manage medical emergencies. Any deviation on the requirements specified in this PTS shall be obtained from the Technical Authority of Occupational Health, PETRONAS Group HSE.

1.1 Scope

This PTS specifies PETRONAS minimum requirements of medical emergency preparedness and response requirements that includes the development and implementation of Medical Emergency Response Plan (MERP). This document shall provide guidance for compliance to HSE Management System (HSEMS), Mandatory Control Framework (MCF), related regulatory requirements and industry standards.

1.2 Glossary of Term

1.2.1 General Definition of Terms & Abbreviations

Refer to PTS Requirements, General Definition of Terms, Abbreviations & Reading Guide PTS 00.01.03 for General Definition of Terms & Abbreviations.

1.2.2 Specific Definition of Terms

No	Terms	Description
1	Cardio Pulmonary Resuscitation	A first aid technique that can be used if someone who are not responsive with no breathing or abnormal breathing or if their heart has stopped. Chest compressions and rescue breaths are performed in an effort to manually preserve intact brain function until further measures are taken to restore spontaneous blood circulation and breathing in a person.
2	Designated First Aider	A person who is trained to give first aid treatment and appointed by the management as the Stage 1 MER responder providing first aid support at the scene of an incident within 4 minutes of any injury or acute illness. DFA competency is acquired through an initial training, and maintained through regular refresher training.
3	Emergency	An adverse situation that has an impact on people, environment, asset and reputation and requires the activation of emergency team
4	Health Advisor	A Medical Doctor employed by PETRONAS/JVs to provide specialist advice on health matters, in enabling the effective implementation of health programs, including benchmarking to International and industry standards.
5	Mass Casualty	Unexpected or expected arrival of number of casualties above the capacity of the site medical facility or the medical team at one time.
6	Medical Evacuation (MEDEVAC)	Emergency transfer of severely injured/ill persons from the incident site to capable Stage 2 and Stage 3 medical facilities using appropriate transportation such as medically equipped ground ambulances or air transportation e.g. air ambulances, helicopter, etc.
7	Remote location	Sites where the medical evacuation of an injured/ill person (IP) to a Stage 3 hospital cannot be guaranteed to be achieved within 4 hours in foreseeable circumstances such as distance, adverse weather conditions, limited transportation, poor terrain conditions and limited medical facilities and capabilities.
8	Topside Medical Support	Topside Medical Support is remote medical support which involves real-time medical advice provided by medical professionals (usually doctors) via telecommunication and/or information technologies in order to initiate the correct treatment early, minimise unnecessary medevac, and expedite necessary medevac.

Table 1: Specific Definition of Terms

1.2.3 Specific Abbreviations

No	Abbreviations	Description
1	AED	Automated External Defibrillator
2	ALARP	As Low As Reasonably Practicable
3	CPR	Cardio Pulmonary Resuscitation
4	DFA	Designated First Aider
5	HRA	Health Risk Assessment
6	HSERM	HSE Risk Matrix
7	MCI	Mass Casualty Incident
8	MECC	Medical Emergency Coordination Centre
9	Medevac	Medical Evacuation
10	MER	Medical Emergency Response
11	MERP	Medical Emergency Response Plan
12	START	Simple Triage And Rapid Treatment
13	OPU	Operation Unit
14	JV	Joint Venture
15	IP	Injured/Ill Person

Table 2: Specific Abbreviations

1.3 Summary of Changes

This PTS 18.15.01 replaces PTS 60.1501.01 (June, 2006).

No.	Statement/ requirement in PTS 60.1501.01	Changes / Addition in PTS 18.15.01	Basis	Impact
1.	Title: Medical Emergency Management	Change the Title to Medical Emergency Response (MER)	To emphasize on Response for MER rather that management of the medical emergencies	
2.	Medical Emergency Response (MER) Tiered Response	Change the term of 'Tier' to 'Stage'.	To avoid confusion for using Tier term in PETRONAS Three-Tiered Emergency/Crisis Response Protocol & Activation.	
3.	Requirement of Medical Emergency Response Plan but no detail description	Detail description of MERP requirement.	PETRONAS-operated facilities and Joint Ventures (JVs) shall have site specific MERP and becomes part of ERP and to be in-line with MCF Emergency Response 10.2	PETRONAS-operated facilities and Joint Ventures (JVs) to develop MERP and incorporate it in Site Emergency Response Plan.
4.	No requirement of Situational Analysis	Inclusion of Situational Analysis of MER.	To assist in development of Site Medical Emergency Response Plan (MERP) and determine the effectiveness of current MERP (Stage response time and resources).	PETRONAS-operated facilities and Joint Ventures (JVs) shall perform situational analysis of MER prior to development of MERP or to determine the effectiveness of current MERP.

5.	Requirement of MER Risk Assessment but no detail description.	Inclusion of MER Risk Assessment when MER stage response time cannot be met. Shall use PETRONAS HSE Risk Matrix.	When MER stage response time cannot reasonably be met, a risk assessment shall be performed to identify stage response and determine risk mitigation measures to ensure that the risks are kept as low as reasonably practicable (ALARP).	MER risk assessment shall be performed if MER stage response time cannot be met. PETRONAS-operated facilities and Joint Ventures (JVs) to recommend: New MER stage response time appropriate risk mitigation measures to keep the risks as low as reasonably practicable (ALARP) both require GHSE OH TA to approve.
6.	No process for recommending new MER Response Time	Approval & Application of New MER Response Time and Risk Mitigation Measures to Keep Risk to ALARP shall be approved by GHSE OH TA.	To cater remote locations which are not able to meet MER response time despite rectifying issues causing delayed response.	Deviation to PTS MER Response Time shall require approval by GHSE OH TA.
7.	Requirement of MER resources but no detail description.	MER resources for each response stage are described clearly on the requirement of personnel, competency, medical facility and equipment.	Latest requirement and best practice.	PETRONAS-operated facilities and Joint Ventures (JVs) to ensure adequate MER resources are available.
8.	Stage 1 MER: Requirement on First Aid Box only	Mandatory requirement of Automated External Defibrillator (AED).	Latest requirement and to ensure Stage 1 MER at worksite is effective.	PETRONAS-operated facilities and Joint Ventures (JVs) to ensure number of DFA is fulfilled and adequate AED is available.
9.	No requirement of DFA re-certification and skills maintenance	DFA Training a) Re-certification every 3 years	To maintain first aider's competency and skills.	PETRONAS-operated facilities and Joint Ventures (JVs) to plan and track DFA training.

		b) Skills are maintained through 12-monthly refresher training.		
10.	Stage 2 MER: No requirement to identify, assess and appoint Stage 2 MER medical facility	a) Identify, assess and appoint Stage 2 MER medical facility b) Latest requirement for site clinic/ sickbay, trauma bag and ambulance.	To ensure Stage 2 MER at worksite is effective.	PETRONAS-operated facilities and Joint Ventures (JVs) to comply with Stage 2 MER requirement.
11.	Stage 3 MER: No requirement to identify, assess and appoint Stage 3 MER hospital	External capable hospital for Stage 3 MER to be identified, assessed and appointed.	To identify capable hospital to manage severe injuries/ illness.	PETRONAS-operated facilities and Joint Ventures (JVs) to carry out the medical facilities assessment to identify capable Stage 3 hospital.
12.	Response to Mass Casualty Incident and Triaging is not mentioned.	Inclusion of Management of Mass Casualty Incident (MCI) including Triaging.	To manage unexpected or expected arrival of number of casualties above the capacity of the site medical facility or the medical team at one time.	PETRONAS-operated facilities and Joint Ventures (JVs) to assess and ensure adequacy of Stage 2 MER responders' capability to manage mass casualty incident.

Table 3: Summary of Change

1.4 Roles and Responsibilities

The Custodian (Occupational Health) in Group HSE Division is the custodian of this document and shall be responsible to periodically review, update and revise the contents of this document and to distribute the revised version to all Heads of PETRONAS-operated facilities and Joint Ventures (JVs).

Heads of PETRONAS-operated facilities and Joint Ventures (JVs) shall be responsible to ensure the implementation and compliance to this document, distribute and communicate all relevant requirements to their employees, contractors and where relevant to visitors.

1.5 Guiding Principles of Medical Emergency Response (MER)

The guiding principles for effective medical emergency response are to:

a. Perform MER Situational Analysis to analyse the effectiveness of MERP by evaluating MER stage response time and resources.

b. Perform MER Risk Assessment when MER stage response time cannot reasonably be met to propose for new MER stage response time and risk mitigation measures to keep the risks to ALARP.

c. Develop Site-specific Medical Emergency Response Plan (MERP)

d. Incorporate MERP as the integral part of the Site Emergency Response Plan.

e. Identify potential medical emergency situations and of their possibilities of escalation.

f. Develop an integrated approach on medical emergency management, involving several disciplines (e.g. HSE, HRM, logistic, operation, supply chain, etc.) to function in a co-ordinated manner.

g. Ensure appropriate MER requirements on:

   i. Adequate and capable/competent MER resources (responders, medical facilities & equipment)

   ii. Network of communications from one level of the health care team to another in order to provide continuous medical support from immediate care on the spot through to treatment in medical facilities.

   iii. Training on MERP

   iv. Regular MER Drills as part of the emergency response drills

   v. Reporting

   vi. Audit and Review

1.6 4-Stage Medical Emergency Response and ALARP

When injury or acute illness occurs at the worksite, medical emergency response SHALL be managed through 4-Stage Response which starts from the time of injury/acute illness.

Stage 1	Provide first aid treatment at the incident site, including defibrillation by a Designated First Aider within 4 minutes of any injury or acute illness.
Stage 2	Provide assessment, stabilization and initial treatment by a medical professional within 1 hour of any injury or acute illness that requires it prior to Medical Evacuation, if required.
Stage 3	Provide medical attention or admission to and care at the nearest capable hospital within 4 hours of any injury or illness that requires it.
Stage 4	Referral to an appropriate specialist hospital in the country of operation or other country.
ALARP	When response times or requirements above cannot reasonably be met, perform a MER RISK ASSESSMENT and provide medical emergency response risk mitigation measures to ensure that the risks are kept As Low As Reasonably Practicable (ALARP).

Table 4: 4-Stage Medical Emergency Response & ALARP

Reference: Remote Healthcare for Energy and Associated Maritime Activities, Institute of Remote Healthcare, 2013

Rapid response is an essential requirement for life saving and minimizing the consequences of injury or acute illness. This 4-stage Medical Emergency Response is to be applied at all installations under operational control, including all phases of work activities and projects.

Several factors may affect medical emergency response time including medevac such as geographical distances, available transportation options, transportation infrastructure, communication, weather, and security.

When any of PETRONAS-operated facilities or JV Companies cannot reasonably meet the MER response times or requirements above despite having rectified all issues that lead to the delayed response time, a MER RISK ASSESSMENT shall be performed for the particular worksite to propose for a new MER stage response time and recommend appropriate risk mitigation measures to ensure that the risks are kept As Low As Reasonably Practicable (ALARP).

1.7 Situational Analysis of Medical Emergency Response (MER)

Situational analysis of Medical Emergency Response at individual worksite shall be performed to:

a. Assist in development of Site Medical Emergency Response Plan (MERP)

b. Determine the compliance to the required standards and effectiveness of current MERP (as-is) at individual worksite by analyzing:

i. MER Stage Response Time

ii. MER Resources (responders, medical facilities and emergency equipment)

1.8 Factors for MER Situational Analysis

When conducting MER Situational Analysis, below are the factors that can be analyzed and example of issues that may impact worksite MER:

1.	WORK LOCATION		
	Factor	Example of Issues	Impact to MER
a)	Distance of the worksite to the nearest capable MER medical facilities	• Worksite is located remote/far from capable MER medical facilities • No road accessibility to MER medical facilities	Delayed Stage 2 & 3 MER response time
b)	Time required to evacuate casualties to the nearest capable MER medical facilities	• Worksite is located remote/far from capable MER medical facilities • Poor terrain & road condition • No MEDEVAC support • Inclement weather	Delayed Stage 2 & 3 MER response time
c)	Number and characteristics of working population	• Potential of mass casualties • Unfit employees • Language barrier • Local vs. expat access for medical treatment locally/overseas • Visa/permit for migrant to enter country for MEDEVAC	• Mass Casualty Incident preparedness • Higher risk of injuries/illnesses due to unfit employees • Delayed Stage 2 & 3 MER response time • Option of MEDEVAC to alternative countries

d)	The nature of work activities performed at the site	• High risk activities e.g. working at height, confined space, exposure to flammable hydrocarbon, etc. • Adequacy of control measures	• Severity of injuries • Requirement of MER responders or site clinic/sickbay • Competency of MER Responder
e)	Occupational health and safety hazard	• High risk activities • Adequacy of control measures	• Severity of injuries • Requirement of MER responders or site clinic/sickbay • Competency of MER Responder
f)	Project duration	• Long or short duration • Risk presence at worksite	• Requirement of MER responders or site clinic/sickbay • Competency of MER Responder • Adequacy of medical equipment/drugs
g)	Security risks presence at the worksite/country	• High security risk • Specific security requirement	• Delayed Stage 2 & 3 MER • Capability of MER medical facilities
h)	Geography and Climate	• No accessibility to MER medical facilities • Inclement weather • Road and terrain condition	• Delayed Stage 2 & 3 MER • Complication of injury/illness
2. RESOURCES AND CAPABILITIES			
a)	MER Responders	• Unavailable/inadequate/ incompetent MER Responders	• Delayed MER Response Time and treatment • Complication of injury/illness
b)	MER Medical Facility & Equipment (a) Site Clinic/Sickbay (b) Nearby/local medical	• Unavailable/inadequate MER Medical Facility & Equipment • MER Medical Facilities/ Equipment incapable to	• Complication of injury/illness • Delayed MER Response Time

	facilities (c) Transportation (d) Local medical support systems – quality, response time (e) External/overseas medical facilities	manage medical emergencies • Unavailable/inappropriate transport for MEDEVAC	and treatment
c)	MEDEVAC Service Provider	• Unavailable/incompetent/incapable MEDEVAC Service Provider • Unclear scope of work	• Complication of injury/illness • Delayed MER Response Time and treatment
d)	Means of effective communication during an emergency	• Unavailability of fast & effective communication	• Complication of injury/illness • Delayed MER Response Time and treatment
3. PUBLIC HEALTH RISK			
a)	Communicable diseases, snake bite, food and water safety	• High prevalence/endemic area e.g. malaria, dengue, cholera, etc. • Unavailability/ inadequacy of treatment e.g. anti-venom for snake bite • Specific public health requirement e.g. vaccination • Unsafe food and water supply	• Complication of injury/illness • Delayed/inadequate treatment
4. LEGAL AND OTHER LOCAL REQUIREMENTS			
a)		• Too strict or lenient local requirement • Visa/permit to enter country for medical treatment	• Complication of injury/illness • Delayed MER Response Time and treatment

Table 5: Factors for MER Situational Analysis

1.9 Who to Perform MER Situational Analysis?

a. Head of HSE or Emergency Response (ER) is responsible to perform MER Situational Analysis at his/her worksite in consultation with PETRONAS Health Advisor.

b. External consultants may be appointed to conduct the MER Situational Analysis, as required, subject to approval by Head of PETRONAS-operated facilities and JV Companies in consultation with PETRONAS Health Advisor.

1.10 Conclusion of MER Situational Analysis

Based on the analysis, below conclusion shall be made on whether:

a. MER Resources meet PTS MER; and

b. MER Stage Response Times meet PTS MER

If MER Stage Response Times and/or Resources do not meet PTS MER, below actions shall be taken:

a. Identify the issues that lead to the PTS MER standard could not be met

b. Recommend appropriate mitigation measures to meet the PTS MER standard

When MER stage response time cannot reasonably be met despite rectifying all issues causing the delayed MER stage response time, MER Risk Assessment shall be performed.

1.11 Review, Endorsement and Approval

The recommended mitigation measures and completed MER Situational Analysis Report shall be reviewed and endorsed by PETRONAS OH TP/Specialist prior to approval by the Management.

1.12 Reviewing MER Situational Analysis

MER Situational Analysis is to be reviewed and revised if there is any significant change which may have impact on MER Response Time and Resources, such as changes in the hazard/risk, work processes, nature, duration, working population & environment, control & recovery measures, resources & capabilities and legal/local requirement

Refer Appendix 1 for the example of Steps to Conduct MER Situational Analysis.

1.13 MER Risk Assessment

MER Risk Assessment is a process aims to determine the severity of risk due to the occurrence of hazards based on the severity and likelihood of its consequences and adequacy/effectiveness of current control/recovery measures.

1.14 When to Perform MER Risk Assessment?

MER Risk Assessment is to be performed following Situational Analysis should the Situational Analysis shows MER Response Time cannot reasonably be met despite rectifying all issues that lead to the delayed response time. It shall be performed prior to the development of Medical Emergency Response Plan (MERP).

1.15 Objective of MER Risk Assessment

The objective of the MER Risk Assessment is for the particular worksite to:

a. Propose new MER Stage Response Time; and

b. Recommend Remedial Action Plan to mitigate the risks to As Low As Reasonably Practicable (ALARP).

1.16 Who to Perform MER Risk Assessment?

a. Head of HSE or Emergency Response (ER) is responsible to perform MER Risk Assessment at his/her worksite in consultation with PETRONAS Health Advisor.

b. External consultants may be appointed to conduct the MER Risk Assessment, as required, subject to approval by Head of PETRONAS-operated facilities and JV Companies in consultation with PETRONAS Health Advisor.

1.17 Methodology

HSE Risk Matrix (HSERM) shall be used to identify the severity of MER risk based on two main factors:

a. The Consequence Category of 'harm to people' i.e. the severity of the outcome (e.g. whether the hazard will cause minor health effect/injury, major health effect/injury, permanent total disability or single/multiple deaths) is used as it is the category most likely to generate the highest RAM Rating. However, it is important to recognise that both Assets, and/or Reputation may also be relevant.

b. The Likelihood of the consequence happening e.g. frequency of a particular type of health effect/injury occurring at the location/OPU, PETRONAS or industry worldwide. The rating assigned to the Likelihood category is based on historical or recorded cases in the location/OPU, PETRONAS or industry worldwide.

Refer to Appendix 2 for HSE Risk Matrix and Appendix 3 for the Example of MER Risk Assessment.

1.18 Conclusion of MER Risk Assessment

Based on MER RISK ASSESSMENT, the assessor shall recommend:

a. New MER Stage Response Time; and

b. Remedial Action Plan to ensure that the risks are mitigated to As Low As Reasonably Practicable (ALARP).

Refer to Appendix 4 for the example of ways/situations in which risks are kept As Low As Reasonably Practicable (ALARP).

1.19 Review, Agreement, Endorsement & Approval

The Recommendations and Application of New MER Stage Response Time and Remedial Action Plan to mitigate risks to ALARP shall be:

a. Reviewed & Agreed by PETRONAS OH TP/Specialist

b. Endorsed by Head of PETRONAS-operated facilities and JV Companies

c. Approved by GHSE OH Technical Authority

1.20 Reviewing MER Risk Assessment

MER Risk Assessment is to be reviewed and revised following Situational Analysis (when MER stage response time cannot reasonably be met) if there is any significant change which may have impact on MER Response Time and Resources, such as changes in the hazard/risk, work processes, nature, duration, working population & environment, control & recovery measures, resources & capabilities and legal/local requirement.

2.0 Medical Emergency Response Plan (MERP)

Medical Emergency Response Plan (MERP) is part of the recovery measures to mitigate the potential adverse effects of abnormal exposure to hazards, such as during incidents, should the control measures fail.

The objectives of the MERP are to save lives and minimise the consequences of injury or acute illness (e.g. heart attack, asthma, etc.) occurring at the work place, as far as is practicable, to assist their full recovery.

PETRONAS-operated facilities and Joint Ventures (JVs) shall develop site-specific Medical Emergency Response Plan (MERP) that describes the appropriate actions to be implemented and requirements for each MER stage response which ranges from Stage 1, Stage 2 up to Stage 3 and 4.

Head of PETRONAS-operated facilities and Joint Ventures (JVs) shall be the Custodian of the document and participate in the development of MERP which is applicable to their operations. The Advisor of PETRONAS-operated facilities and Joint Ventures (JVs) shall be involved in its development as the technical advisor. The MERP shall then be incorporated in Site Medical Emergency Response Plan.

The MERP should also consider specific needs of the work activities and the general situation of the country in which these activities are carried out, as well as any collaboration with local authorities.
The MERP is a written document that covers, but not limited to the following:

a. MER Stage Response
    i. Response time for each MER Stage (as per the PTS) or approved revised response time with mitigation measures
    ii. Description of Actions for each MER Stage
    iii. Action Parties (MER Responders)

b. MER Resources
    i. MER Responders adequacy and competency
    ii. Budget
    iii. Medical facility/provider and equipment for all MER Stages
    iv. Contents, quantity and location of first aid kits, AED, stretchers, etc.
    v. Transportation requirement (ground ambulance, air evacuation, etc.)
    vi. Topside medical advice, as required.

c. Organisation (roles and responsibilities) e.g. HSE personnel, Human Resource personnel, OH Practitioners, Emergency Management Team, Designated First Aiders, MER Stage 2 Responders, 3rd Party Medical Provider, etc.

d. MEDEVAC procedure

   i. From incident site to Stage 2 and 3 medical facilities

   ii. Regional/International Medevac

   iii. Transportation for medevac

   iv. Clearance to land (e.g. helicopter, air ambulance)

e. Communication

   i. Communication flow or call-out scheme amongst MER responders at all MER Stages and between MER responders and other relevant internal and external parties.

   ii. Internal emergency telephone numbers

   iii. List of external service providers with contact points, emergency telephone numbers (e.g. local/regional and international Medevac providers)

f. Training contents and schedules for relevant MER responders

g. Inspection schedule for medical emergency equipment e.g. first aid kit, AED, stretchers, emergency trolley, etc.

h. Medical emergency response drills

   i. PETRONAS-operated facilities and Joint Ventures (JVs) should include medical emergency response scenario in planned emergency drills or stand-alone MER drills.

   ii. The frequency of MER drills may follow OPUs planned emergency drills.

   iii. Reports from medical emergency drills should be retained and a process should be in place to correct any deficiencies identified.

i. Guides for visitors, business travellers, and third parties, if appropriate.

Refer to Appendix 5 for MERP Flow and Appendix 6 for the Example of Site MERP.

2.1 MER Resources

Resources required for a successful, effective and fit-for-purpose implementation of MERP are the personnel/responders, their competencies and medical facility and emergency equipment.

Stage	Action	Action Party	Location	Response Time (from incident time)	Minimum Equipment Requirement	Minimum Training Requirement	Skill Maintenance
Stage 1	First Aid treatment and defibrillation	Designated First Aider (DFA)	Incident site	Within 4 minute	• First Aid Box • Automated External Defibrillator (AED)	DFA Training (every 3 years)	DFA Skill Refresher (12-monthly)
Stage 2	Medical Assessment, Stabilization, Initial Treatment & MEDEVAC (if required)	Site/ Remote Medical Professio-nal	Incident Site/ Site Clinic/ Appoin-ted Clinic/ Hospital	Within 1 hour	• Ambulance • Relevant Emergency Medical Equipment • Trauma Bag	• Medical Professional Training • Advanced Cardiac Life Support (ACLS) training • Trauma Life Support Training is highly recommended	ACLS refresher (possess valid certificate)
Stage 3	Medical attention or admission to and care at the nearest capable hospital	Medical Doctor/ Specialist	Hospital	Within 4 hours	• Ambulance • Hospital Medical Equipment and Supplies	• Medical Professional Training	
Stage 4	Referral to an appropriate specialist hospital in the country of operation or other country.	Medical Doctor/ Specialist	Hospital	As appro-priate	• Ambulance • Hospital Medical Equipment and Supplies	• Medical Professional Training	

Table 6: Summary of MER Resources according to MER Stage Response

2.2 Stage 1 MER Resources

A) Personnel/Responder

Stage 1 MER Responder is the Designated First Aider (DFA). DFA are trained to give first aid treatment at the scene of an incident within 4 minutes of any injury or acute illness.

It is recommended for the Management of PETRONAS-operated facilities and Joint Ventures (JVs) to officially appoint DFA and clearly state their roles and responsibility in the appointment letter.

The required number of DFA at the worksite as per below Table 7.

Description	No. of Worker	No. of DFA at any one time
(a) Workplaces with low risk hazards (e.g. office)	Less than 20	1 (one)
	21 – 150	2 (two)
	> 150	2 (two) for every 150 workers or part thereof
(b) Workplaces with high risk hazards (e.g. chemical plant, shipyard, offshore facilities, construction site)	Less than 20	1(one) per shift
	20 or more	1 (one) for every 20 workers
Note: If there is a shift work schedule, there shall be a sufficient number of DFA for each shift.		

Table 7: Number of DFA required at any one time

Reference: Guidelines on First Aid in the Workplace (2nd Edition), 2004

B) Competency Requirement

DFA competency is acquired through an initial training, and maintained through regular refresher training.

C) Mandatory DFA Training

Designated First Aider shall possess Mandatory DFA Training which requires re-certification every 3 years. It shall be conducted by PETRONAS approved training providers.
The required modules for Mandatory DFA Training are outlined below:

a. Introduction: Principles of First Aid

b. Provision of Basic Life Support (BLS) with use of Automated External Defibrillator (AED)

c. Vital Signs

d. Management of Specific Emergencies

e. Dressings, Bandages and Slings

f. Patient Handling, Immobilization and Patient Transfer

g. Workplace First Aid

   i. Roles and Responsibilities

   ii. Workplace First Aid Kit

   iii. Medical Evacuation

   iv. Medical Communication

   v. Material Safety Data Sheet (MSDS)

   vi. Triage and Multiple Casualty Situations

   vii. Legal Aspects of First Aid

D) DFA Skills Maintenance (Refresher Training)

DFA Skills are maintained through 12-monthly refresher training. These are commonly informal practical sessions at the workplace, facilitated by a senior DFA or a medical professional. Skills commonly covered during these sessions are Basic Life Support, Automated External Defibrillator, Dressings, Bandages and Slings, Patient Handling, Immobilization and Patient Transfer and application of Workplace First Aid Kit. Each session generally lasts 1-2 hours.

E) Medical Facility and Equipment

The mandatory equipment for Stage 1 MER are:

a. First Aid Box

   First aid boxes should only be used and maintained by Designated First Aiders (DFA). The exact requirements and quantities should be based on the site's MER Situational Analysis. The first aid box should be clearly marked, accessible and maintained.

   Refer to Appendix 7 for First Aid Items.

b. Automated External Defibrillator (AED)

The automated external defibrillator (AED) is a computerized medical device that can check a person's heart rhythm and advice the rescuer when a shock is needed. The AED uses voice prompts, lights and text messages to tell the rescuer the steps to take.

AED is be used by DFA and personnel trained in (CPR) and how to use an AED. An AED operator must know how to recognize the signs of a sudden cardiac arrest and perform cardiopulmonary resuscitation (CPR). After the AED is attached and delivers a shock, the typical AED will prompt the operator to continue CPR while the device continues to analyze the victim.

It's also important for operators to receive formal training on the AED model they will use so that they become familiar with the device and are able to successfully operate it in an emergency. Training also teaches the operator how to avoid potentially hazardous situations.

Refer to Appendix 8 for Recommended AED Technical Specification.

Principal factors for a proper AED site selection are:

i. An easily accessible and visible position.

ii. A well-marked location.

iii. A secure location that prevents or minimize the potential for tampering by an unauthorized users, theft and/or misuse.

However, AED may not be indicated for the following situations:

i. AEDs are not intrinsically safe devices to be used at/near identified/designated area.

ii. Where the law of the country only allow the use of defibrillator by a medical doctor and there is no doctor on site to use the AED.

Refer to Appendix 9 for the Criteria in Deciding Optimal Placement of an AED.

Based on the Situational Analysis of MER, the supplementary facilities/equipment for Stage 1 MER below may be considered at the worksite to support MERP.

c. First Aid Room/Station

First aid room is a facility to provide first aid services required for the initial treatment of person suffering from illness or injury at the worksites. The room should be:

i. Clearly identified by the sign “First Aid Room”;

ii. Easily accessible to work area so as to facilitate transfer of patients;

iii. Large enough to hold a treatment couch and still have space for people to move about;

iv. Having adequate privacy;

v. Maintained at comfortable temperature and humidity.

d. Quarantine Facility

For the purpose of preventing the spread of any communicable disease e.g. flu, chicken pox, tuberculosis, etc. an identified place for quarantine (for isolation of patient) should be identified by the Worksite Manager particularly in remote location.

Good ventilation helps reduce the risk of spread of communicable disease, thus a quarantine facility shall have a separate ventilation system or High Efficiency Particulate Air (HEPA) filter. HEPA filter removes all airborne particles from the air that is passed through it. Thus, it is important to specify the quarantine facility layout very early in the planning stage, so this can be incorporated in the initial design and construction.

e. Supporting equipment

In some cases it may be necessary to move a sick or injured employee and management should ensure that appropriate equipment - such as stretchers or wheelchairs - are readily available for use. In general, a single stretcher or wheelchair placed in a clearly identified and readily accessible location will be adequate and appropriate.

However, where a worksite covers a large area or is divided into a number of separate or self-contained working areas, it may be necessary to provide suitable additional equipment at a number of places within the worksite, for instance stretchers to be placed at areas identified for working at height activities e.g. tank cleaning, to carry the IPs down for further treatment.

2.3 Stage 2 MER Resources

A) Personnel/Responder

Medical Professionals for Stage 2 MER are usually nurses, medics and sometimes doctors/physicians from the following:

a. PETRONAS-operated facilities and Joint Ventures (JVs) permanent staff; or

b. PETRONAS-operated facilities and Joint Ventures (JVs) contracted staff; or

c. Third party service provider staff

They are responsible to assess, stabilize, provide initial treatment and perform MEDEVAC, if required of injured or ill employees. In addition, they may also responsible for the provision of primary healthcare, preventive care, public health and occupational health services.

B) Competencies

MER Stage 2 responders requires as minimum, the competencies as follows:

a. Shall have at minimum Diploma in Nursing or Diploma in Medical Assistant or equivalent academic qualification

b. Shall possess a valid professional registration/licence with the relevant regulatory body e.g. registered as a Medical Assistant with the Board of Medical Assistants, Ministry of Health, Malaysia or registered as a Registered Nurse with the Nursing Board, Ministry of Health Malaysia for medics practicing in Malaysia.

c. Shall hold a valid practicing certificate with the relevant regulatory body e.g. Annual Practicing Certificate from the Malaysian Ministry of Health for medics practicing in Malaysia.

d. Shall have at least three (3) years of working experience post-graduation with

   i. Minimum of one (1) year experience in an emergency unit, trauma unit or similar settings within last 3 years; or

   ii. At least two (2) year of working experience as an Industrial Medic/Nurse. For offshore, at least two (2) year of working experience as Offshore Medic.

e. Shall have valid certifications in Advanced Cardiac Life Support (ACLS) Training.

f. Trauma Life Support or equivalent is strongly recommended.

g. Occupational and Public Health Training are strongly recommended.

C) Medical Facility and Equipment

PETRONAS-operated facilities and Joint Ventures (JVs) shall ensure the Stage 2 response time i.e. within 1 hour can be met at all times including during the hours of darkness through any of the following:

a. Establish a site clinic/sickbay within the vicinity of the facility, or

b. Assign/appoint nearby public/private clinic/hospital as Stage 2 MER responder, or

c. Appoint dedicated third party medical service provider to provide Stage 2 MER services

Appendix 10 provides the List of Recommended Items in Trauma Bag, Ambulance and Site Clinic/Sickbay. The requirement of such items can be determined via Situational Analysis and input from Health Advisors may be obtained.

D) Site Clinic/Sickbay

A site clinic/sickbay may be established within the vicinity of the facility to ensure the Stage 2 response time i.e. within 1 hour can be met at all times including during the hours of darkness. Site clinic/sickbay is a medical facility which normally provides primary health care, medical treatment and medical emergency management for employees at site.

Some sites have very small number of personnel (e.g. less than 25 people on site), or may operate within a very limited period (e.g. less than one month). In these circumstances, a site clinic/sickbay may not be practicable to implement. This is a common situation in marine, seismic and logistic operations. In this situation, MER risk assessment shall be carried out in order to ensure Stage 2 response time is met or risks are effectively being managed As Low As Reasonably Practicable (ALARP).

Space constraints in some location especially remote area limit the size available for a site clinic/sickbay. Where possible utilize space-saving furniture, fittings and equipment. It is important to specify the site clinic layout very early in the planning stage, so this can be incorporated in the initial design and construction. Once built, structural changes to a vessel, rig or building are often difficult to implement.

As a minimum, consider the following room and layout of the site clinic/sickbay:

a. Within a safe area

b. Easy ingress and egress with stretcher

c. Easy access to ambulance or helipad

d. Exclusive use and availability as a site clinic

e. Adequate space to hold up 2 beds/stretchers and working space (e.g. tables, chairs and storage cabinets)

f. Ventilation, illumination and temperature control

g. Hand washing facilities

h. Medical waste disposal system

i. Lockable filing cabinet

j. Material Safety Data Sheet (MSDS) and medical reference materials

k. Direct communication system with site manager and Topside Medical Support (as required)

l. Medication storage

m. Drug refrigerator

n. Potable water – hot and cold

o. Toilet and shower

p. Accommodation for Stage 2 MER Medical Professionals is immediately adjacent to the site clinic/sickbay

Refer to Appendix 11 for Recommended Medication for Site Clinic/Sickbay

E) Trauma Bag

Stage 2 MER Medical Professionals often need to mobilize quickly to the incident site to provide stabilization, therefore, adequate and suitable medical equipment to be carried in a trauma bag by a single person to the incident site.

Refer to Appendix 10 for List of Recommended Items in Trauma Bag.

F) Company Facility without Site Clinic/Sickbay

For PETRONAS-operated facilities and Joint Ventures (JVs) that do not have site clinic/sickbay within the vicinity of the facility, they shall ensure Stage 2 MER response time is met at all times including during the hours of darkness by appointing/engaging capable external medical facilities/providers e.g. public/private clinic or hospital and emergency response provider.

G) Ambulance

A capable ambulance is essential to transport the IP out of the incident site for further medical management at Stage 2 MER medical facility and onward transfer to Stage 3 hospital if required.
The provision of ambulance at certain worksite is subject to several factors including remoteness of location from the nearest medical facility, capability of the nearest medical facility, time taken to evacuate the IPs using ground ambulance, availability of alternative modes of evacuation, number of personnel at the worksite, duration of work, etc.

Any ambulance provided by the company facility or third party provider, it shall conform to the requirements mentioned below:

a. In compliance with local legislation and regulatory requirements

b. Suitable for the local road and terrain conditions

c. Suitable for stretcher recovery work – the door should fully open and allow free and unrestricted access.

d. Equipped with harness to secure the casualty

e. Equipped with seat belt for the Stage 2 Medical Professionals in the stretcher cabin

f. Have emergency rotating flash lights

g. Have a beam spotlights at the rear of the vehicle

h. Have stretcher cabin with suitable temperature control, adequate lighting, and fixture for IV drip, water bottles for drinking and hand washing and no sharp or protruding objects.

i. The utilisation of ambulance shall strictly limited to transporting injured/ill employees only.

Refer to Appendix 10 on the List of Recommended Items in an Ambulance

2.4 Stage 3 MER: Hospital Facility and Equipment

A) Personnel/Responder

Stage 3 & 4 MER Medical Facilities i.e. public/private hospitals are manned by Medical Professionals. The number and capabilities of the workforces are normally based on the hospital's or government/country requirement.

B) Hospital Facility and Equipment

PETRONAS-operated facilities and Joint Ventures (JVs) shall ensure the Stage 3 response time i.e. within 4 hours can be met at all times including during the hours of darkness.

Stage 3 MER shall be provided by capable external hospital i.e. public or private hospital. Prior to appointing/engaging the hospital for Stage 3 MER, the PETRONAS-operated facilities and Joint Ventures (JVs) shall assess and verify the capability of such medical facilities to manage medical emergency.

2.5 Assessment of stage 2, 3 and 4 MER Medical Facilities and Equipment

It is responsibility of PETRONAS-operated facilities and Joint Ventures (JVs) to identify, assess and assign/appoint medical facilities that are capable to provide Stage 2 and Stage 3 MER for existing or new operations/projects.

For site clinic/sickbay, periodic assessment/assurance to be conducted to evaluate their preparedness.

The assessor for Stage 2 and 3 medical facilities shall comprise at minimum one (1) personnel with medical background.

Other representatives such as HSE personnel, HRM and Supply Chain representative, etc. can also be included as part of the assessors as necessary.

For Stage 2 MER medical facility, the critical/minimum requirement for the medical facilities that need to be assessed shall include:

a. Medical Professionals' competencies and availability

b. Medical equipment, including ambulance

c. Drugs and consumable items

d. Layout

e. Operating procedures.

For Stage 3 MER Hospital, below are the critical or minimum requirement for the medical facilities that need to be assessed:

a. Location and accessibility to medical facilities from the worksite

b. Access to the local healthcare system (e.g. public/private)

c. Operating hours and standby (on-call) team

d. Medical procedure and protocols

e. General medical/surgical capabilities and specialties

f. Number and capabilities of medical personnel

g. Diagnostic equipment and facilities

h. Availability/adequacy for trauma and medical emergencies management and facilities including stabilization capabilities, Intensive Care Unit (ICU), operating theatres, ward, etc.

i. Availability/adequacy and evaluation of blood supply

j. Availability and standard of pharmaceutical and medical supply

k. Availability of morgue

l. Availability/adequacy of ground transport and accessibility with other medical transport services

m. Capability to arrange/manage medical evacuation for regional and international medevac

For Stage 4 MER Hospital, it is highly recommended for the PETRONAS-operated and JVs to identify, and assess, if required, to facilitate the process for referring the IP to specialist hospital when required. Examples of Stage 4 medical facilities are hospitals with burn units, cardio surgery, neurosurgery, hemodialysis, etc.

Refer to Appendix 12 for Example of Stage 3 and 4 MER Hospital Assessment Form

3.0 Medical Evacuation (MEDEVAC)

Medical Evacuation (Medevac) is an emergency transfer of severely injured/ill persons from the incident site to a capable Stage 2 and/or Stage 3 medical facilities using appropriate transportation such as medically equipped ground ambulances or air transportation e.g. air ambulances, helicopter, etc.

Prompt transportation of severely injured/ill employees from the incident site to Stage 2 site clinic/sickbay and onward transfer to Stage 3 hospital is crucial. Medevac arrangements using appropriate transport shall be established in MERP.

All key staff including duty managers, supervisors, and members of emergency management/response teams, medical professionals and Designated First Aiders shall be made aware on the medical evacuation process and arrangement. Any changes to the written arrangements on medevac shall be advised to the above staff.

The transportation arrangement should specify on:

a. Mode of transportation from the incident site to Stage 2 Site Clinic and/or Stage 3 medical facilities

b. Roles and responsibilities of individuals responsible for transportation

3.1 Mode of Transportation

A) Ground Ambulance

Where the transfer of seriously injured/ill employees from the incident site to Stage 2 Site Clinic and/or Stage 3 medical facilities may be required, an ambulance should be provided.

The utilisation of ambulance shall strictly limited to transporting injured/ill employees only.

There should be a written guidelines on the usage of ambulances and to be made available to all relevant personnel. The guidelines should also include the names of individuals who are responsible for the maintenance, checking and logging of medical items in the ambulance. When necessary, a written agreement between the Line Manager and the ambulance provider on the usage of ambulance shall be documented.

B) Air Evacuation (e.g. helicopter, air ambulance, etc.)

If the MER Situational Analysis and/or Risk Assessment show the need of air evacuation to transport the injured/ill employees from the worksite or Stage 2 site clinic/sickbay to a capable Stage 3 or 4 medical facilities for further medical management, the PETRONAS-operated facilities and Joint Ventures (JVs) shall arrange and have written agreement with the capable and recognised air evacuation or medevac service provider.

There should be a written guidelines on the usage of air transport or air ambulances and to be made available to all relevant personnel. Any changes to the written arrangements on medevac shall be advised to the personnel.

Should other means of transportation is required based on MER Situational Analysis and/or Risk Assessment, the Line Manager shall arrange and have written agreement with transportation service provider.

3.2 Topside Medical Support

Topside Medical Support is remote medical support involves real-time medical advice provided by medical professionals (usually doctors) via telecommunication and/or information technologies.

The objective of Topside Medical Support are to:

a. initiate the correct treatment early

b. minimise unnecessary medevac

c. expedite necessary medevac

Topside Medical Support maybe required to enhance the site MER capability especially in locations where the MER stage response time cannot reasonably be met. However, it cannot be considered as a replacement for a competent remote medical professionals.

Topside is responsible in providing medical advice which includes:

a. Provisional diagnosis

b. Immediate treatment required

c. The need of MEDEVAC

d. Destination hospital, evacuation transportation and route and medical support requirements during transport if MEDEVAC is recommended.

4.0 Managing Mass Casualty Incident (MCI)

A mass casualty incident (MCI) is defined as the unexpected or expected arrival of number of casualties above the capacity/resources of the site medical facility or the medical team at any one time.

To qualify as a MCI, the number and severity of victims have to overwhelm the present arrangement and capacity/resources of the Stage 2 site clinic.

The medical professionals of the site clinic/sickbay shall ascertain its capability of managing MCI and when to obtain external support. The PETRONAS-operated facilities and JVs shall also aware of the capability and readiness of their Stage 2 MER medical facility in managing MCI.

When MCI is declared by Stage 2 MER site clinic/sickbay, the IPs are handled in order of severity of the injury/illness rather than on a first come, first served basis.

The process of sorting according to severity of the injury/illness is called TRIAGING which is based on colour coding i.e. Triage-Red (Critical), Triage–Yellow (Semi Critical), Triage-Green (Non-critical) and Triage-Black (Expectant).

Triage-Red (Critical) and Triage–Yellow (Semi Critical) will be the priority for transporting the IPs to primary Stage 3 hospital.

MCI activation will also be followed by coordination with nearby Medical Facilities (Public or Private) to provide medical support such as medical personnel, medical equipment, ambulances, etc. to manage the IPs at the medical base. Involvement of nearby medical facilities to provide medical support for MCI will be activated by Stage 2 MER responders.

4.1 Triage for Mass Casualties or Multiple Injuries

Triage is the sorting or prioritising of MER action based on need for treatment and the available resources to provide it. In simple terms it aims to ‘do the most for the most gain’. In cases of multiple casualty incidents it also refers to sorting of those who should be treated first because their problems require priority attention or which patients need to be transferred to a higher care centre first.

Triage shall be applied in:

a. The communication of all medical emergencies, between DFA and MER professionals.

b. The prioritisation of incidents involving multiple casualties.

Triage can be performed quickly by assessing:

a. Ability to walk and talk

b. Airway

c. Breathing and respiratory rate

d. Circulation (including pulse and blood pressure)

The main actions of Triage are:

a. Rapidly identify patients with urgent life threatening conditions.

b. Determine the most appropriate treatment area to transfer the patient.

c. Provide on-going assessment and review triage labels as situation dictate.

The priorities of Triage are as shown in Table 8. It should always be kept in mind that this staging may not be static, the three main natural steps of resuscitation should be followed – assess, treat as triaged and re-evaluate.

Priority	Colour	Description	Explanation	Examples
1	RED	Critical (Immediate)	Conditions that are a threat to life or limb with imminent risk of deterioration. The casualty is considered first priority for aggressive resuscitation, surgical intervention or transport to advanced facilities. Injuries are severe, and are likely to survive with immediate treatment. Immediate aggressive resuscitation is required.	Tension pneumo-thorax, severe bleeding.
2	YELLOW	Semi-Critical (Delayed)	These are conditions that could potentially progress to a serious problem requiring emergency intervention. Observation by trained persons and frequent re-triage is required. The casualty will need hospital care (and would receive immediate priority care under "normal" circumstances). Urgent emergency attention required.	Clinical suspicion of ectopic pregnancy with stable signs, proximal long bone fractures, compound fractures.
3	GREEN	Non-Critical (Minor)	Conditions where intervention can be delayed. The casualty will require a doctor's intervention, but may not deteriorate immediately. Emergency action is delayed or non-urgent till concurrent stages 1-2 above are stable or transferred.	Closed fracture of distal areas, sprained ankle.
4	BLACK	Expectant (Deceased)	The casualty is so severely injured that they are either dead or in a terminal state and beyond resuscitation.	Lethal large-area body burns

Table 8: Triage Priorities

Refer to Appendix 13 for Simple Triage And Rapid Treatment (START) Flow Chart and Appendix 14 for Sample of Triage Tag/Card.

5.0 BIBLIOGRAPHY

In this PTS, reference is made to the following Standards/Publications. Unless specifically designated by date, the latest edition of each publication shall be used, together with any supplements/revisions thereto:

PETRONAS TECHNICAL STANDARDS

HSE Management System, March 2014	PTS 18.00.01
Medical Emergency Management, June 2006	PTS 18.15.01
PETRONAS Contingency Planning Standard, March 2015	PTS 18.40.01

INTERNATIONAL STANDARDS

American Heart Association Guidelines, 2015

Remote Healthcare for Energy and Associated Maritime Activities, Institute of Remote Healthcare, 2013

OTHER REFERENCES

Memorandum on HSE RISK MATRIX (HSERM), Reference No: GHSED/SGM/ME/2015/0303-78 issued 26th March 2015

Guidelines on First Aid in the Workplace (2nd Edition), DOSH Malaysia, 2004

Appendix 1: Steps to Conduct MER Situational Analysis

Step 1: Identification of Issues Affecting Worksite MER (Response Time & Resources)

No.	Factors	Any Concern?		Issue	Impact to MER
		YES	NO		
	A. Worksite				
1	Distance of the worksite to the nearest medical facilities: a. Stage 2 medical facility? b. Stage 3 hospital?				
2	Time required to evacuate casualties to the nearest medical facilities: a. Stage 2 medical facility? b. Stage 3 hospital?				
3	Number and characteristics of the working population e.g. age profile, gender mix, migrant status, etc.				
4	Nature of work activities performed at site				
5	Project duration				
6	Occupational health and safety hazards presence at worksite				
7	Security risks presence at worksite/country				
8	Geography and Climate				
	B. Resources and Capabilities				
9	On-site MER Resources and its competencies a. MER personnel (doctor, medic, nurses, first aiders, etc.) b. MER capabilities (medical facilities, equipment, ambulance, etc.)				

10	External nearby/local medical facilities a. Capability and competency b. Quality and response times of local medical support systems				
11	Medevac services a. Logistic availability b. Capability to transport casualties to medical facilities via ground, water and air				
12	Means of effective communication during emergency				
	C. Others e.g. Public Health risks, Legal Requirements, etc.				

Note: Refer to page 15 – 17 for Example of Issues and Impact to MER

<u>Step 2</u>: Based on Step 1, Assess if the MER Response Times & Resources are met as per PTS MER and explain Reasons for not meeting the MER Response Time & Resources Standards

MER	Resources Met		Response Time Met		Reasons for Not Meeting MER Response Time & Resources Requirement
	Yes	No	Yes	No	
Stage 1 First Aid Treatment within 4 minutes					
Stage 2 Assessment, Stabilization & Initial Treatment by Medical Professional within 1 hour					
Stage 3 Admission and Medical Care to Stage 3 Hospital within 4 hours					

<u>Step 3</u>: In Event Where MER Response Time & Resources Could Not Be Met, Recommend the Appropriate Mitigation Measures

No.	Reasons for Not Meeting MER Requirement (Response Time/ Resources)	Recommended Mitigation Measures	Action Party	Deadline

Assessment conducted by:	Assessment and Recommended Mitigation Measures reviewed & endorsed by:	Assessment and Recommended Mitigation Measures approved by:
Signature Name/Designation of HSE/ ER Manager	Signature Name/Designation of TP OH/Specialist	Signature Name/Designation of Head, PETRONAS-operated Facilities/JV
Date	Date	Date

Appendix 2: HSE Risk Matrix

Consequence		SEVERITY	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
		People	Slight Injury	Minor Injury	Major Injury	Single Fatality	Multiple Fatalities
					Major Health Effects*	Permanent Total Disability*	Permanent Total Disability*
		Environment	Slight Impact	Minor Impact	Moderate Impact	Major Impact	Massive Impact
		Asset	Slight Damage	Minor Damage	Local Damage	Major Damage	Extensive Damage
		Reputation	Slight Impact	Limited Impact	Considerable Impact	Major National Impact	Major International Impact
LIKELIHOOD	**E Almost Certain**	Incident has occurred several times per year in OPU	E1	E2	E3	E4	E5
	D Likely	Incident has occurred in OPU; or more than once per year in PETRONAS	D1	D2	D3	D4	D5
	C Possible	Incident has occurred in PETRONAS; or more than once per year in industry world wide	C1	C2	C3	C4	C5
	B Unlikely	Incident has occurred in industry, world-wide	B1	B2	B3	B4	B5
	A Remotely likely to happen	Never heard of in industry world-wide but could occur	A1	A2	A3	A4	A5

VERY HIGH
HIGH
MEDIUM
LOW

* For chronic health effects

Reference: Memorandum on HSE RISK MATRIX (HSERM), Reference No: GHSED/SGM/ME/2015/0303-78 issued on 26th March 2015.

APPENDIX 3: Example of MER Risk Assessment

An example of a MER Risk Assessment is shown below. Please note that each work location is unique and that the appropriate controls for one location will not be same for another.

	Hazard/ Situation	Risk Assessment			Existing Control	Recommended Remedial Action Plans
		Likelihood	Consequence	Risk		
1.	Delayed Stage 3 MER Response time (e.g. due to distance, logistic, etc.)	Likely *(Incident has occurred in OPU; or more than once per year in PETRONAS)*	Major (Single Fatality)	**Very High**	• Competent DFA • Sickbay is available	• Enhanced MER competency for Stage 2 MER medical professionals • Additional medical equipment • Topside support • Dedicated medevac transport • Telemedicine
2.	Heart Emergencies	Likely *(Incident has occurred in OPU; or more than once per year in PETRONAS)*	Major (Single Fatality)	**Very High**	• Fitness to Work (FTW) Program • Regular Worksite Health Promotion	• Fitness to Work (FTW) Program emphasizing on cardiac risk factors to be implemented, tracked and audited • Stricter FTW requirement for selected remote location
3.	Safety Hazard e.g. Working at Height, mechanical failure, etc. leading to burn, fractures, bleeding, etc.	Likely *(Incident has occurred in OPU; or more than once per year in PETRONAS)*	Major (Single Fatality)	**Very High**	• Competent DFA • Sickbay is available	• Additional MER resources and capability (DFA, medical professionals) • Enhance MER competency • Additional medical equipment • Topside support

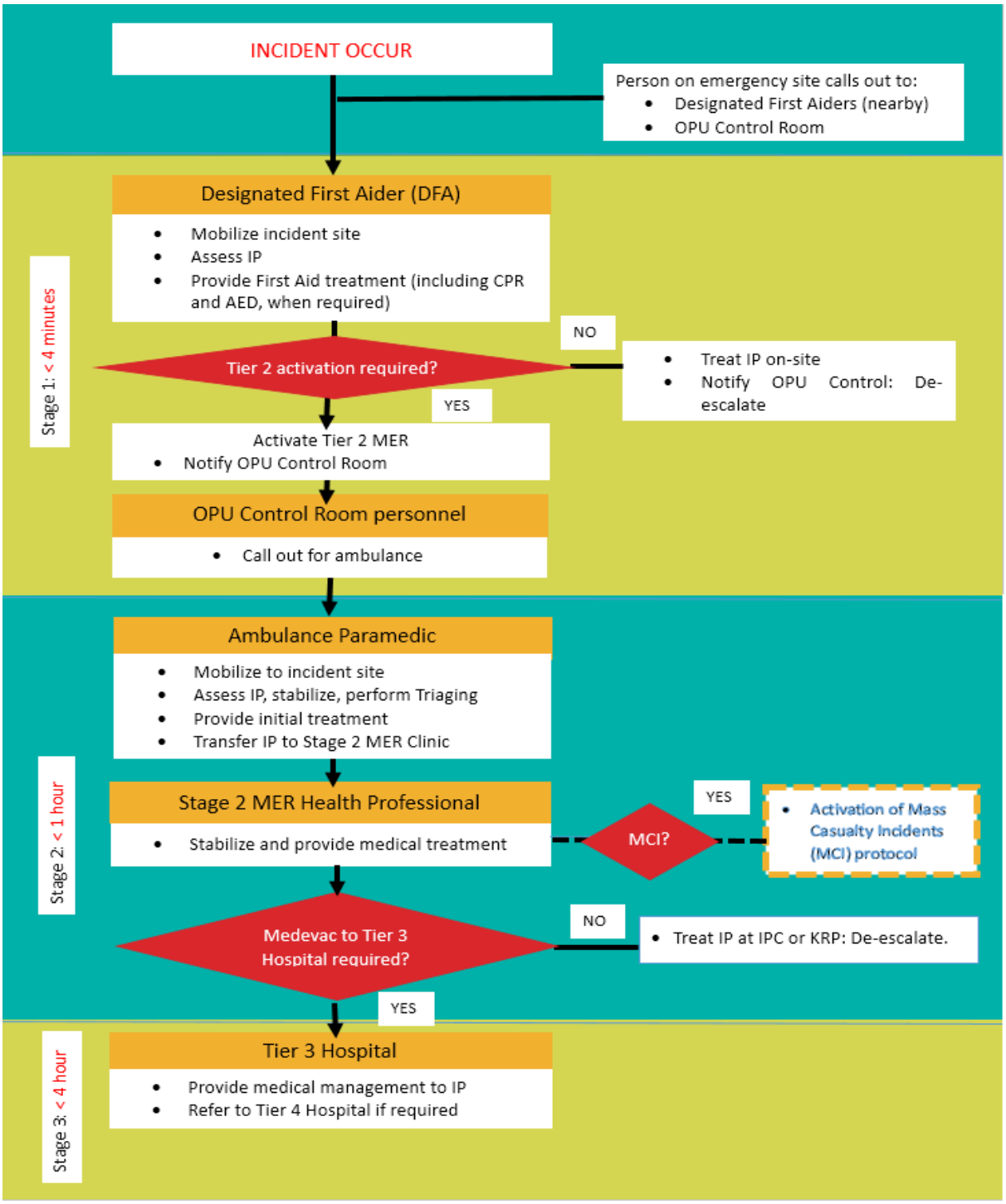
4.	Heat	Possible *(Incident has occurred in PETRONAS; or more than once per year in industry world-wide)*	Major Health Effects	**Medium**	• Employees awareness program • Fitness to work (FTW) assessment	• Work-rest regime when working outdoors • Facilities for hydration
5.	Snake Bite	Possible *(Incident has occurred in PETRONAS; or more than once per year in industry world-wide)*	Major (Single Fatality)	**High**	• Employees awareness program	• Availability of Antidote • Enhance knowledge and skill of managing snake bite for MER Stage 1 or 2 responders
Assessment done by:		**Reviewed & agreed by:**		**Endorsed by:**		**Approved by:**
Signature HSE/ER Manager		Signature OH TP/Specialist		Signature Name/Designation of Head, PETRONAS-operated Facilities/JV		Signature OH Technical Authority, GHSE
Date:		Date:		Date:		Date:

APPENDIX 4: Demonstrating ALARP (Risks Are Kept As Low As Reasonably Practicable)

Below are the examples of ways/situations in which risks are kept As Low As Reasonably Practicable (ALARP) when:

NO	How Risks are Kept ALARP	Examples
1	Additional health resources and capability	• Increased number of Designated First Aiders • Increased number of Medical Professionals at Site Clinic/Sickbay • Increased competency • Additional medical equipment • Shortening of stage response times, etc.
2	Enhanced Communication Capabilities	• Telemedicine • Vessel tracking • Video observation, etc.
3	Improved Transportation and Shortening Evacuation Times	• Faster transportation • Transportation on standby • Redundant transportation • All-weather transportation

Appendix 5: Example of Medical Emergency Response Flow



Appendix 6: Example of Site Medical Emergency Response Procedure

STAGE	Description	Action	By	Response Time (from the time of incident)
	First Response	1. Make Safe. 2. Call Out to Designated First Aider (nearby) 3. Call Out to OPU Control Room/Centre by walkie-talkie or OPU emergency line/number 4. OPU Control Room to call for Designated First Aider/Emergency Response Team (ERT). 5. OPU Control Room to call Stage 2 MER ambulance e.g. site clinic ambulance, third party ambulance service provider, if required.	People on emergency site	Immediate
STAGE 1	First Aid treatment & Basic Life Support	1. Mobilize to scene 2. Non Process Area: Assess IP and provide First Aid treatment and Basic Life Support (to include CPR & AED). 3. Process Area (with hydrocarbon exposure): Assess IP and provide First Aid treatment and Basic Life Support (to include CPR). If AED is required to be used, mobilize IP to nearest building. 4. OPU Control Room to call Stage 2 MER ambulance e.g. site clinic ambulance, third party ambulance service provider, if required, using dedicated means of communication and number. Essential information to inform Stage 2 MER ambulance e.g. site clinic ambulance, third party ambulance service provider: a) Name of caller b) Location/Plant c) Type of medical emergency e.g. burn, chemical injury, heart attack, trauma etc. d) Number of casualty/IPs	OPUs Designated First Aiders (DFA)	4 minutes

STAGE	Description	Action	By	Response Time (from the time of incident)
STAGE 2	Stabilize, Initial Treatment, Transfer to Stage 2 MER Medical Facility	1. Mobilize to scene with Stage 2 MER Ambulance and its medical equipment 2. Ensure personnel chemical decontamination already conducted by dedicated team at incident site, if required. 3. Assess IP, stabilize, perform Triaging and provide initial treatment 4. Stage 2 MER ambulance paramedic notify Medical Team at Stage 2 MER Medical Facility via phone or walkie-talkie. Essential information to inform Stage 2 MER Medical Facility: a) Number of casualty/IPs to be transferred to Stage 2 MER Medical Facility b) Type of medical emergency e.g. burn, chemical injury, heart attack, trauma etc. c) Location of incident 5. Transfer IP to Stage 2 MER Medical Facility using Ambulance 6. Ambulance paramedic to accompany and provide treatment while transporting victim 7. Ambulance paramedic to handover the IP to Stage 2 MER Medical Professionals and document the observation of the IP in Triage cards.	Ambulance paramedic	1 hour

STAGE	Description	Action	By	Response Time (from the time of incident)
STAGE 2	Stabilize, provide medical treatment and medevac	1. Receive IP from Ambulance Paramedic 2. Stabilize and provide medical treatment to IP 3. Medevac IP to Stage 3 Hospital, if required. Decision to send IP to hospital is to be made by the Medical Officer on duty at Stage 2 MER Medical Facility. 4. Inform the receiving Stage 3 Hospital on the medevac/referral case. 5. Transfer IP to Stage 3 Hospital using Ambulance accompanied by Stage 2 Medical Professionals, if required 6. Handover IP to the receiving Stage 3 Hospital 7. Provide update of the IP medical condition, if required	Medical Professionals at Stage 2 MER Medical Facility	
STAGE 2 Mass Casualty Incident(MCI)	Provide adequate resources to stabilize, provide medical treatment and medevac during MCI	1. Activate Stage 2 MER Medical Facility MCI response 2. Call for support via State Medical Emergency Coordination Centre (MECC) e.g. Hospital Kuala Terengganu is 09-6212000. MECC subsequently coordinate to call for support (medical professional, ambulances etc.) from nearby government medical facilities (Health Clinics, Hospitals) 3. Triage, stabilize and provide medical treatment to IPs 4. Medevac IPs to Stage 3 Hospital accompanied by Stage 2 MER Medical Professionals with MECC coordination, if required	Stage 2 MER Medical Professionals & External Medical Teams	As soon as practicable

STAGE	Description	Action	By	Response Time (from the time of incident)
STAGE 3	Provide admission and medical care at Stage 3 Hospital	1. Receive IP from Stage 2 MER 2. Provide medical management to the IP 3. Refer/transfer IP to Stage 4 Hospital, if required	Stage 3 Hospital	4 hours
STAGE 4	Referral to an appropriate specialist hospital	1. Receive IP from Stage 3 Hospital Medical Professionals 2. Provide definitive medical management to the IP	Stage 4 Hospital	Depends on the case

APPENDIX 7: FIRST AID Items

First Aid Items are as below:

1.	Automated External Defibrillator (AED)
2.	First Aid Box that contains: (a) Barrier devices and protection i. Barrier device for cardiopulmonary resuscitation (CPR): pocket mask, or face shield ii. Rubber gloves (disposable/non-sterile) iii. Protective goggles iv. Plastic apron v. Waterproof biohazard waste bag (b) Vital signs equipment i. Digital thermometer ii. Automatic blood pressure measurement device (optional) iii. Oxygen Saturation Monitor (optional) (c) Bandages i. Triangular bandages 130cm x 90cm x 90cm ii. Elastic (crepe) bandage iii. Stainless steel bandage scissors iv. Safety pin for triangular bandages v. Adhesive tape (d) Dressings i. Sterile 4x4” gauze pads ii. Sterile 10x10” gauze pads iii. Sterile eye pads iv. Sterile multi-trauma dressing/gauze v. Elastoplast/sterile adhesive dressing vi. Alcohol prep pads vii. Antiseptic wash (normal saline) viii. Cotton buds ix. Burn sheet/dressing (optional) (e) Foil blanket (adult size) (f) Cold pack/hot pack compress (g) Splints (if possible one SAM splint - optional) (h) Miscellaneous: adhesive tape, cotton buds, safety pins, pen, paper, scissors (i) Guides: Basic Life Support (BLS) algorithm card, first aid pocketbook, first aid manual (j) Inventory of box contents (checklist)

APPENDIX 8: Recommended AED Technical Specification

a. Defibrillator

i. Voice prompt, visual icon guide responder

ii. Waterproof and Dust protector

iii. Self-diagnose function to confirm a person has cardiac arrest when it is being applied in the victim

iv. Meets AAMI DF 80 guidelines and AHA recommendations for adult defibrillation

v. Allow accurate ECG analysis

b. Battery

i. 9 Volt DC

ii. Minimum 200 shocks/4 hours operating time

iii. Labelled with installation date

iv. Standby life minimum 5 years warranty period

v. Additional free battery

c. Pads

i. Disposable pads

ii. Labelled by date if at least 2 years from date of manufactured

d. Automated and user activated self-test

i. Automatic self-test tested internal circuitry, waveform delivery system, pads and battery capacity

ii. Able to conduct pad integrity test

iii. Able to conduct extensive automatic self-tests and user interactive tests to check

iv. Device readiness upon battery insertion

e. Defibrillator cabinet

i. Surface mounted

ii. Audible alarm

iii. Flashing light system

iv. Carry Case

f. AED wall signage

APPENDIX 9: Criteria in Deciding Optimal Placement of an AED

1. Able to meet 4 minutes response time as per MER protocol.
2. Physical layout of facility: Large facilities with several separate buildings or buildings with unusual designs, elevators, and other physical impediments, present unique challenges. In these instances, multiple AED locations is recommended.
3. Other placement considerations: project site/areas, off site business activities at locations far from medical facilities, remote locations such as off-shore drilling rigs, construction projects, marine vessels, power transmission lines, and energy pipelines, etc.
4. A secure location that prevents or minimizes the potential for tampering by unauthorized users, theft and or misuse.
5. An easily accessible and visible position
6. A well-marked, publicized location with a nearby telephone to call backup medical emergency response and security personnel. Installing an automatic notification system for back up medical emergency response team can be considered. In this case, opening the AED storage cabinet or removal of the AED automatically triggers the system.

Possible locations include:

- First Aid room/station
- Site clinic/Sick bay
- Security guard station/posts
- Main reception area
- Walls of main corridors
- Cafeteria
- Fitness facility
- Near elevators
- In secured or restricted access areas

Note:
AED is not intrinsically safe device and it may not be possible to be used in several locations e.g. operation areas where there is possible exposure to hydrocarbon.

APPENDIX 10: List of Recommended Items in Trauma Bag, Ambulance and Site Clinic/Sickbay

Item	Trauma Bag	Ambulance	Stage 2 Site Clinic/ Sickbay
A. Ventilation and Airway Equipment			
1. Portable/fixed suction apparatus	✓(portable)	✓	✓
2. Portable/fixed oxygen cylinder with resuscitator and variable flow regulator	✓	✓	✓
3. Oxygen administration equipment nasal cannulas and face masks	✓	✓	✓
4. Pocket mask with one-way valve	✓	✓	✓
5. Ambu-bag and Mask	✓	✓	✓
6. Guedel Airway & Nasopharangeal Airway	✓	✓	✓
7. Laryngoscope handle and blades with extra batteries and bulbs	✓	✓	✓
8. Endotracheal tubes (including stylettes)	✓	✓	✓
9. Nasogastric tubes	✓	✓	✓
10. Magill forceps	✓	✓	✓
11. Lubricating jelly (water soluble)	✓	✓	✓
12. Securing tape	✓	✓	✓
13. Supraglottic Airway (size 3 & 4)	✓	✓	✓
B. Monitoring and Defibrillation			
1. Automated External Defibrillator	✓	✓	✓
2. Portable, battery-operated monitor/ defibrillator			✓
3. ECG machine (12-lead)			✓
C. Immobilisation Devices			
1. Cervical collars	✓	✓	✓
2. Head immobilisation device		✓	✓
3. Lower extremity (femur) traction devices		✓	✓
4. Upper and lower extremity immobilisation devices		✓	✓
5. Backboards (long, short) and extrication device (KED)		✓	✓
6. Sam Splint (for pelvic injuries).		✓	✓
D. Bandages and Sutures			
1. Burn sheet/dressing	✓	✓	✓
2. Triangular bandages with safety pins	✓	✓	✓
3. Gauze rolls (sterile, various sizes) & Gamgees	✓	✓	✓
4. Elastic bandages (non-sterile, various sizes)	✓	✓	✓

5. Adhesive tape (various sizes, hypoallergenic)	✓	✓	✓
6. Suturing kit (including assorted sutures, steristrips, artery forceps, needles, needle holder, etc).	✓		✓
7. Assorted scalpels, blades, razors, scissors,etc.			✓
E. Communication			
1. Two-way radio communication	✓	✓	✓
F. Medical and Miscellaneous Supplies			
1. Sphygmomanometer (adult regular and large)	✓	✓	✓
2. Stethoscope	✓	✓	✓
3. Thermometer with low temperature capability	✓	✓	✓
4. Medic scissors for cutting clothing, belts, and boots	✓	✓	✓
5. Cold/Hot packs		✓	✓
6. Normal and Sterile saline solution for irrigation (1-liter bags)		✓	✓
7. Flashlights (2) with extra batteries and bulbs	✓	✓	✓
8. Blankets (including thermal absorbent blanket and head cover		✓	✓
9. Sheets, linen/paper, pillows		✓	✓
10.Towels		✓	✓
11.Triage tags	✓	✓	✓
12.Disposable emesis bags or basins		✓	✓
13.Disposable bedpan		✓	✓
14.Disposable urinal		✓	✓
15.Urinary indwelling catheter			✓
16.Wheeled cot (properly secured casualty transport system) and hospital bed/stretcher		✓	✓
17.Folding stretcher		✓	✓
18.Stair chair or carry chair		✓	✓
19.Casualty care charts/forms/recording books	✓	✓	✓
20.Tongue depressor	✓	✓	✓
21.Magnifying glass	✓	✓	✓
22.Autoclave or sterilizer			✓
23.Refrigerator			✓
24.Otoscope / Ophthalmoscope			✓
25.Percussion Hammer			✓
26. Appropriate heat source		✓	✓
G. Infection Control			
1. Eye protection (full peripheral glasses or goggles, face shield)	✓	✓	✓
2. Face Masks	✓	✓	✓
3. Gloves, non-sterile	✓	✓	✓

4. Disposable gowns	✓	✓	✓
5. Shoe covers			✓
6. Disinfectant hand wash/waterless hand cleanser, commercial anti-microbial (towelette, spray, liquid)	✓	✓	✓
7. Disinfectant solution for cleaning equipment	✓	✓	✓
8. Standard sharps containers		✓	✓
9. Disposable trash bags (identifiable colour, such as red)	✓	✓	✓
H. Vascular Access			
1. Intravenous administration equipment sets (microdrip and macrodrip), including pressure bag for IV fluid administration and securing/dressing tape	✓	✓	✓
2. Crystalloid solutions, Normal saline and Dextrose 10% (x 2 and x 1 in trauma bag)	✓	✓	✓
3. Alcohol wipes	✓	✓	✓
4. IV pole or roof hook		✓	✓
5. Intravenous catheters assorted sizes	✓	✓	✓
6. Tourniquet, rubber bands	✓	✓	✓
7. Syringes of various sizes	✓	✓	✓
8. Needles of various sizes	✓	✓	✓
9. Interosseous needle or Bone Gun			✓
I. Advanced Equipment			
1. Nebulizer		✓	✓
2. Glucometer (with reagent strips and lancets)		✓	✓
3. Pulse oximeter		✓	✓
4. Chest drains			✓
5. Urinary catheters			✓
J. Optional Advanced Equipment			
1. Portable Ventilators		✓	✓
2. Automatic blood pressure device	✓	✓	✓
3. Oxygen Saturation Monitor		✓	✓
4. Blood sample tubes			✓

K. Medications			
1. Cardiovascular medication (*Adrenaline, Atropine*, Amiodarone, Lidocaine, Adenosine, Propranolol, Nitroglycerin tablets, Aspirin, Hydrocortisone, Dexamethasone, Salbutamol, Frusemide, Magnesium Sulphate)	✓	✓	✓
2. 50% dextrose solution (and sterile dilutent			✓
3. Analgesics (Tramadol, hydrochloride, Voltaren)*	✓	✓	✓
4. Antiepileptic/Antipsychotics (Diazepam*, Midazolam,, Haloperidol*)			✓
5. Activated charcoal			✓
6. Xylocaine Inj 2%	✓	✓	✓

Note:

1. The asterisk mark (*) items are only to be used/approved for use by a Registered Medical Practitioner.
2. Health Advisor maybe be consulted for the items required.

APPENDIX 11: List of Recommended Medication for Site Clinic/Sickbay

Drug group & Indications	Medication	Special Instruction
ANTACIDS For indigestion, gastritis, peptic ulcer	Mg Trisilicate 500 mg Tab *(Gelusil tabs)*	Group B
	Mist Mg Trisilicate *(Syrup MMT)*	Group B
	* Esmoprazole 40mg Tab *(Nexium)*	Group A
ANTISPASMODIC Abdominal colic/ Ureteric colic	Hyoscine 10mg Tab *(Buscopan)*	Group B
	*Hyoscine Inj 20mg/ml/amp *(Buscopan)*	Group A
ANTIDIARRHEAL Food poisoning, Traveler's diarrhea	Loperamide 4mg Tab *(Immodium)*	Group B
	Oral Rehydration Salt	Group B
LAXATIVES	Bisacodyl 5mg Tab *(Dulcolax)*	Group B
	Sennosides Tab *(Senokot)*	Group B
HAEMORRHOIDAL Anal prolapse, piles	Anusol Supp	Group B
	*Daflon 500mg Tab	Group A
COUGH & COLD Cough, sneezing, running nose	Diphenhydramine HCl *(Benadryl syrup)*	Group B
	CloperastineHCl10mg Tab *(Copastin)*	Group B
ANTI-HISTAMINE For allergic condition, rhinitis	Chlorpheniramine 4mg Tab *(Piriton)*	Group B
	Chlorpheniramine Inj 10mg/amp *(Piriton)*	Group B
	Loratadine10mg Tab *(Clarityn)*	Group B
DECONGESTANT	*Oxymetazoline nasal spray *(Afrin nasal spray)*	Group A
MILD ANALGESIC & ANTIPYERETICS	Paracetamol 500mg Tab *(Panadol)*	Group B
	Ibuprofen 400mg Tab *(Brufen)*	Group B
MODERATE TO SEVERE PAIN – ANALGESIC	Met. Salicylate Ointment *(LMS)*	Group B
	Mefenemic Acid 250mg Tab *(Ponstan)*	Group B
	Diclofenac Sodium 50mg Tab *(Volteran)*	Group B
	Diclofenac Sodium Inj 75mg/amp *(Volteran)*	Group A
	*Celecoxib 200mg Cap *(Celebrex)*	Group A
	*Eterocoxib 120mg Tab *(Arcoxia)*	Group A
	*Orphenadrine citrate 35mg/Paracetamol 450mg Tab *(Norgesic)*	Group A
	Tramadol 50mg Tab *(Tramal)*	Group B
	*Morphine Inj 10mg/amp	Group A
ASTHMA / ACUTE BRONCHOSPASM	Salbutamol sulfate 4mg Tab *(Ventolin)*	Group B
	Terbutaline sulfate2.5mg Tab*(Bricanyl)*	Group B
	Salbutamol Nebulizer 2.5 mg/amp & Combivent Nebules	Group B
	*Prednisolone 5mg Tab Hydrocotisone inj.	Group A
TRANQUILISERS & HYPNOTICS For anxiety, insomnia, etc.	*Diazepam Inj 10mg/amp *(Valium)*	Group A
	*Haloperidol 10mg/amp	Group A
	Metochlorpromide Inj 10mg/amp *(Maxolon)*	Group B

ANTI-EMETICS & MOTION SICKNESS /VERTIGO	Dimenhydrinate50mg Tab (Novomine)	Group B
	Prochlorperazine Inj 12.5mg/amp *(Stemetil)*	Group B
ANTIBIOTICS	*Amoxcycillin 500mg Cap	Group A
	Erythromycin ethylsuccinate 400mg Tab(EES)*	Group A
	*Cefuroxime 250mg Tab *(Zinnat)*	Group A
ANTI FUNGAL	Miconazole Cream	Group B
EYE ANTISEPTICS & ANTI INFECTIVE	Chloramphenicol eye drop *(CMC)*	Group B
	Chloramphenicol eye ointment *(CMC)*	Group B
	Optrex eye wash	Group B
EAR MEDICATION & ANTI INFECTIVE	Chloramphenicol ear drop *(CMC)*	Group B
MOUTH & THROAT PREPARATION	Strepsils Dual Action (Anaesthetic) Lozenge	Group B
	Oral Aid	Group B
	Triamcinolone acetonide *(Kenalog oral paste)*	Group B
SKIN PREPARATION	Difflam Gurgle	Group B
	Neomycin 0.5% Cream	Group B
	Betnovate 0.1% Cream	Group B
	Calamine lotion	Group B
	Burnol / Savlon Cream	Group B
	Flavin Lotion	Group B
ANTISEPTIC & DISINFECTANTS	Hibiscrub solution	Group B
LOCAL ANAESTHETCS Local pain killers for minor procedure	Ethyl Chloride spray	Group B
	Xylocaine Inj 1% (bottle)	Group B
	Xylocaine Gel (Tubes)	Group B
VACCINE	Tetanus Toxoid	Group B
RESUSCITATION & ANAPHYLAXIS	*Adrenaline Inj 1mg/Amp	Group A
	*Hydrocortisone Inj 200mg/Amp	Group A
	*Sodium Bicarbonate 8.4%/amp	Group A
	*Atropine 1mg/amp	Group A
ANTI ANGINA	*Glyceryl Trinitrate 500mcg Tab *(GTN)* – Sublingual	Group A
	*Tab Aspirin 300mg	Group A
ANTI HYPERTENSION	*Captopril 25mg Tab *Amilodipine 5mg	Group A
ANTI DIABETIC	Metformin 500mg Tab	Group B
HYPOGLYCEMIA	Dextrose 50% Inj Dextrose 10%	Group B
ANTIVENOM	Polyvalent 1unit/amp (Depends on the area)	Group B

Note:

1. **Group A Drugs:** Administered only under orders from qualified medical practitioner. During emergencies, Medic may prescribe these drugs to save life if doctors are not contactable. However, the doctor should be informed of this at the earliest opportunity and the prescription recorded.

2. **Group B Drugs:** May be prescribed by qualified medic/nurse without consultation with doctors. Such prescription will be recorded into patient record.

3. **Controlled Drugs:** Refers to drug listed as controlled drugs under applicable law e.g. Dangerous Drug Act 1952 in Malaysia.

4. **Antivenom**: consideration to be given in Remote Areas only, subject to discussion with Health Advisor.

APPENDIX 12: Example of Stage 3 & 4 Hospital Assessment Form

PETRONAS

PETRONAS HOSPITAL ASSESSMENT FORM
(FOR STAGE 3 AND 4 HOSPITAL)

Assessor	Name		
	Designation		
	BU/OPU		
Date of Assessment			
Information obtained from	Name		
	Designation		
	Department		

A. Hospital	
Name of Hospital:	
Address:	
Telephone No:	
Fax No:	
Website/Email address:	
Type of Hospital:	☐ Government ☐ Military ☐ Private ☐ Teaching
Hospital Services:	☐ In-patient ☐ Out-patient ☐ Emergency ☐ Pharmacy ☐ Surgical ☐ Burn Unit ☐ Radiology/Imaging ☐ ICU ☐ Laboratory ☐ Dental service ☐ Others (please specify)
Can foreign patients be treated and admitted?	☐ Yes ☐ No
Main Contact:	
Position:	
Email/address:	
Telephone No:	
Comment:	
Suitable for Primary Health Care?	☐ Yes ☐ No
Suitable for Occupational Health Services?	☐ Yes ☐ No
B. Location	

			Distance & Duration (km/minutes)
PETRONAS location to Hospital			
Hospital to Airport			
C. Capacity			
Number of inpatient bed:			
Bed Occupancy Rate:			
Average number of Outpatients per day:			
Average number of admission per day:			
Highest cases/illnesses prevalence being treated:			
Comments:			
D. Medical Staffing			
Total Number of Doctors:			
Number of General Practitioner/Medical Officer:			
Specialities/Consultant			Number of Specialists/Consultants:
1.	Paediatricians/Neonates	☐ Yes ☐ No	
2.	Obstetric & Gynaecologist	☐ Yes ☐ No	
3.	General Surgeons	☐ Yes ☐ No	
4.	Internal Medicine Specialist/Physicians	☐ Yes ☐ No	
5.	Nephrologists	☐ Yes ☐ No	
6.	Cardiologist/Cardiothoracic surgeon	☐ Yes ☐ No	
7.	Respiratory Specialist	☐ Yes ☐ No	
8.	Emergency Specialist	☐ Yes ☐ No	
9.	Ophthalmologist (Eye)	☐ Yes ☐ No	
10.	ENT Specialist (Ear, Nose and Throat)	☐ Yes ☐ No	
11.	Dermatologist (Skin)	☐ Yes ☐ No	
12.	Psychiatrist	☐ Yes ☐ No	
13.	Radiologist	☐ Yes ☐ No	
14.	Pathologist/Microbiologist	☐ Yes ☐ No	

15. Neurologist (Nerve/Brain) and Neuropsychiatrist	☐ Yes	☐ No	
16. Oncologist (Cancer)	☐ Yes	☐ No	
17. Endocrinologist (Hormone)	☐ Yes	☐ No	
18. Orthopaedic Specialist/Surgeon	☐ Yes	☐ No	
19. Anaesthetist	☐ Yes	☐ No	
20. Cosmetic/Plastic Surgery	☐ Yes	☐ No	
21. Others (Please specify)			
Total number of resident employees: GP/MO: Specialist/Consultant: Nurses/Medical Assistant/Medic:			
Do staff speak English:	☐ Yes	☐ No	
Comment:			
E. Emergency and Trauma			
24-hours Emergency Department:	☐ Yes	☐No	☐Uncertain
24-hours Admission:	☐ Yes	☐No	☐Uncertain
No of beds in A&E:			
Equipment:			
Defibrillator	☐ Yes	☐ No	Quantity:
Patient Monitor	☐ Yes	☐ No	Quantity:
Ventilator	☐ Yes	☐ No	Quantity:
Adequate Lighting	☐ Yes	☐ No	☐ Uncertain
Resus Trolley available?	☐ Yes	☐ No	Quantity:
Resus Trolley Checklist available	☐ Yes	☐ No	☐ Uncertain
How many times is it checked?			
Who is responsible for the checking?			
Is there a Patient Triage system?	☐ Yes	☐ No	☐ Uncertain
Is there a Doctor on duty 24 hours a day?	☐ Yes	☐ No	☐ Uncertain
Is the doctor qualified in Emergency Medicine?	☐ Yes	☐ No	☐ Uncertain
Average number of patient seen per day?			
Average number of patient admitted per day?			
Mass Casualty Emergency Preparedness	☐ Yes	☐ No	☐ Uncertain
How many extra beds can be made available at the ER in case of need?			
Is there a Mass Casualty Response Plan protocol in place?	☐ Yes	☐ No	☐ Uncertain

If yes, describe:			
General Appearance and Cleanliness:	☐ Good	☐ Average	☐ Poor
Comments:			
F. Facilities/Equipment			
Ambulance services are available?	☐ Yes How many? …….	☐ No	☐Uncertain
Is ambulance as per PETRONAS standard?	☐ Yes	☐ No	☐Uncertain
Comment:			
G. Helipad			
Working Helipad available on HQ grounds?	☐ Yes	☐ No	☐Uncertain
If no, where is the nearest helicopter landing and what is the duration of transfer to the Emergency Department?			
Comment:			
H. ICU & CCU			
No of ICU & CCU beds:			
No of high dependency units:			
No of ICU & CCU ventilators:			
No of ICU & CCU patient monitors:			
Defibrillators available in ICU & CCU?	☐ Yes ☐ No	Quantity:	
Anaesthetist available?	☐ Yes ☐ No		
Are ICU & CCU nurses trained in Intensive Care?	☐ Yes ☐ No	☐ Uncertain	
Comments:			
I. Radiology/Imaging			
X-ray available	☐ Yes ☐ No	Quantity:	
Ultrasound	☐ Yes ☐ No	Quantity:	
CT Scan available	☐ Yes ☐ No	Quantity:	
MRI available	☐ Yes ☐ No	Quantity:	
Does a radiologist always provide the interpretation of the X-Rays?	☐ Yes ☐ No	☐ Uncertain	
Is there a 24 hours service (including on-call for imaging services)?	☐ Yes ☐ No	☐ Uncertain	
Comment:			
J. Lab			
Is the laboratory on site?	☐ Yes ☐ No	☐Uncertain	
Do qualified personnel manage the laboratory service?	☐ Yes ☐ No	☐Uncertain	
Is there a 24 hours service (including on call services)?	☐ Yes ☐ No	☐Uncertain	
Lab Services:			

Bacteriology	☐ Yes	☐ No	☐ Uncertain
Microbiology	☐ Yes	☐ No	☐ Uncertain
Haematology	☐ Yes	☐ No	☐ Uncertain
Serology	☐ Yes	☐ No	☐ Uncertain
Biochemistry	☐ Yes	☐ No	☐ Uncertain
Histopathology	☐ Yes	☐ No	☐ Uncertain
Urine Drug Screening	☐ Yes	☐ No	☐ Uncertain
Blood Bank/ Transfusion:	☐ Yes	☐ No	☐Uncertain
Rapid test for blood screening e.g. HIV?	☐ Yes	☐ No	☐ Uncertain
Confirmatory blood test?	☐ Yes	☐ No	☐ Uncertain
Comment:			
K. Wards			
Number of general wards:			
Specialized wards			Number of beds
Paediatric ICU	☐ Yes	☐ No	
Adult ICU	☐ Yes	☐ No	
Coronary Care Units	☐ Yes	☐ No	
Post Cardiac Surgery Units	☐ Yes	☐ No	
Special Care Baby Unit	☐ Yes	☐ No	
Delivery Suite	☐ Yes	☐ No	
VIP Ward	☐ Yes	☐ No	
Special Nursing Ward	☐ Yes	☐ No	
Oncology	☐ Yes	☐ No	
Day-care Ward	☐ Yes	☐ No	
General Appearance and Cleanliness:	☐ Good	☐ Average	☐ Poor
Comment:			
L. Operating Theatre			
Number of operating theatre:			
Number of specialized theatre room:			
Comment:			
M. Burn Unit			
Does the facility have a Burn Unit?	☐ Yes	☐ No	☐ Uncertain
No of beds:			
Specialist/Consultant managing Burn Unit	☐ Yes	☐ No	☐ Uncertain
Comment:			
N. Morgue			
Does the facility have a morgue?	☐ Yes	☐ No	☐Uncertain
Is autopsy performed locally?	☐ Yes	☐ No	☐Uncertain
Comment:			
O. Pharmacy			

Does a qualified pharmacist manage the pharmacy?	☐ Yes	☐No	☐Uncertain
Does patient have to purchase medications from outside?	☐ Yes	☐ No	☐Uncertain
Are medications available meeting international standards?	☐ Yes	☐No	☐Uncertain
Comment:			

P. Referral Services

Where does the hospital refer patients that they cannot care for (e.g. major burn, multiple trauma, head injury and cardiac emergency?)

Q. Overall Impression

How would you rate the capability of this hospital to manage emergency cases?	☐ Satisfactory Please specify:	☐ Unsatisfactory
How would you rate the capability of this hospital to provide overall treatment?	☐ Satisfactory Please specify:	☐ Unsatisfactory

R. Conclusion

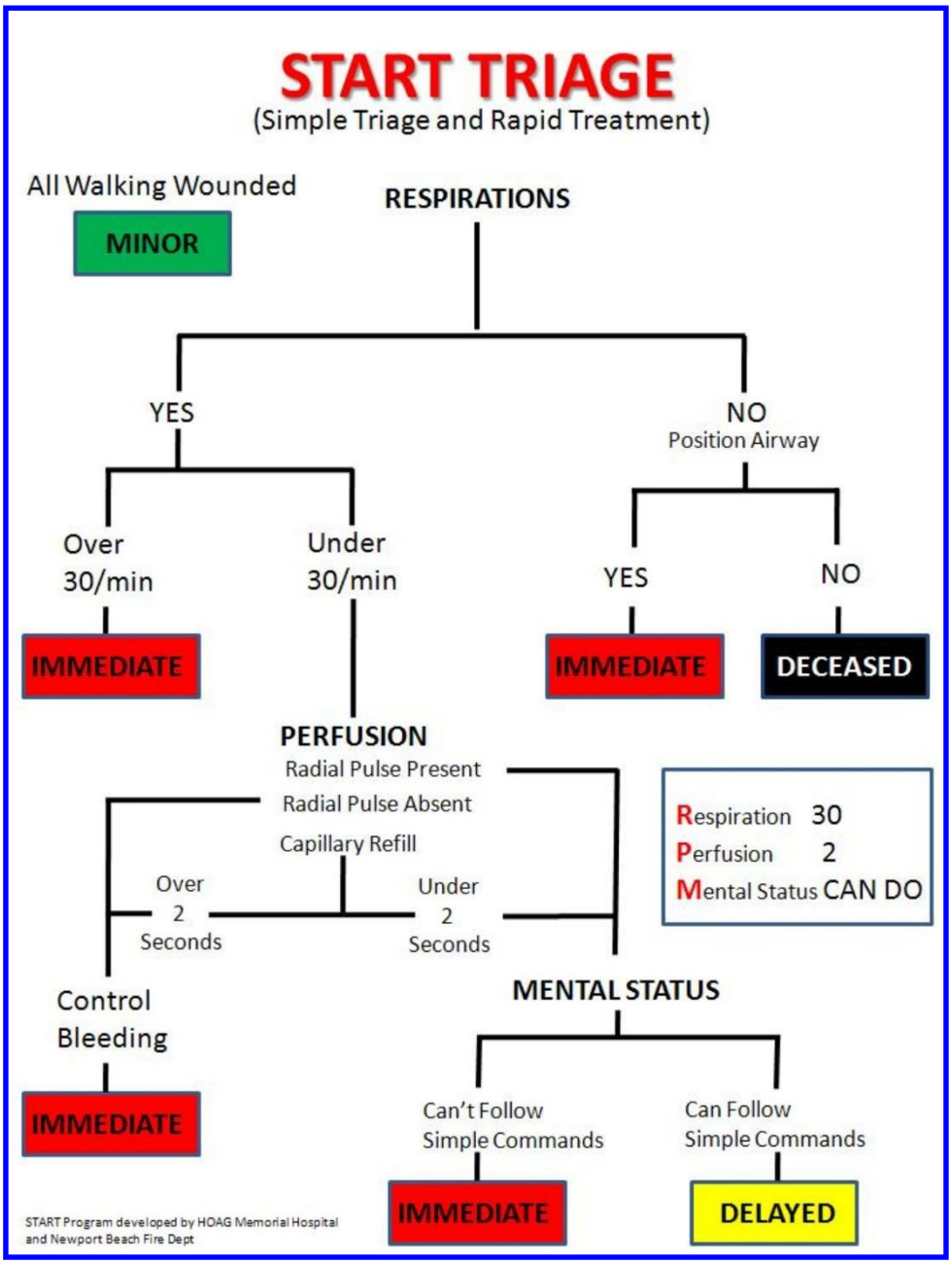
Recommendation by Assessor/s :(please tick)	**YES**	**NO**
Recommended for Stage 3 Hospital		
Recommended for Stage 4 Hospital		

Comment:

S. Report Preparation and Endorsement

Report prepared by:	***Report endorsed by (Specialist/TP OH – Principal/Custodian):**
Signature: ……. Name: Designation: HCU/BU/OPU: Date:	Signature: ……. Name: Designation: HCU/BU/OPU: Date: **For report prepared by TP OH/Specialist, endorsement is not required.*

APPENDIX 13: Simple Triage and Rapid Treatment (Start) Flow Chart



APPENDIX 14: Sample of Triage Tag/Card

Folded

Unfolded