

ERL MAINTENANCE SUPPORT SDN BHD

(Company No. 498574-T)



SAFETY AND SECURITY DEPARTMENT

**DANGEROUS EVENT INVESTIGATION REPORT
PROCEDURE**

Ref. No.: G00.OMZ.M15880.QF.0001.C

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Release

Released:	Thomas Baake	Chief Executive Officer	27/02/19	Th. Baake
Checked:	Ham Mow Wai	Maintenance	26.02.19	[Signature]
Checked:	Anthony Arokianathan	Wayside	14.02.19	[Signature]
Checked:	Aziz Hashim	Signalling	14.02.19	[Signature]
Checked:	Noel Devan	Electrification	7 Feb 2019	[Signature]
Checked:	Abdul Halim Baharom	Infrastructure	14/2/19	[Signature]
Checked:	Jayarajah Savarimuthu	Rolling Stock & Engineering	26.02.19	[Signature]
Checked:	Muhamad Dzulfaqar Yusoff	Project and Engineering	13/2/19	Dzh
Checked:	Norazman Abu Hassan	Rolling Stock	19/2/19	[Signature]
Checked:	James Boudville	Operations	7.2.19	[Signature]
Checked:	Norhandee Nordin	Transportation	07.02.19	[Signature]
Checked:	Omar Zakir	Operations Control Center	07.02.19	[Signature]
Checked:	David Thiagarajan	Documentation & Administration	7/02/19	[Signature]
Checked:	Sukhbir Singh	Safety & Security	28/01/19	[Signature]
Author:	Azrin Lazim	Safety & Security	25.01.19	[Signature]
	Name	Dept.	Date	Signature

Amendments or additions to this procedure must be indicated with a vertical black line in the adjacent left margin.

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Change Record and Configuration Control

C	19 Dec 18	Revise of Section 3, Section 5.3, Section 8.3, Section 10.1, Section 10.2, DEIR in appendix A and updating of wording related to Land Public Transport Agency / Act 715.	Azrin
B	1 Dec 05	Revise section 3, 4.3, 7, 8.3, 11 and Appendices	Baake
A	7 Aug 02	New	Hunt
Revision	Date	Modification	Name

Planning Of Changes Reference For Revision: G00.OMZ.M15880.QF.0001.C					
Issues To Consider	Checked <i>(Please mark X)</i>				Remarks
1) Are there any negative impact?	YES		NO	X	
2) Will the integrity of QEMS be affected?	YES		NO	X	
3) Resources available?	YES	X	NO		
4) Allocation or relocation of responsibilities and authorities required?	YES	X	NO		Refer to clause 10.1

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1 Purpose

This investigation procedure provides a systematic approach to examination of the circumstances of dangerous events, accidents and incidents, with the objective of:

- identifying root cause(s) and;
- recommending corrective measures to reduce the probability that the event will recur.

This investigation procedure is to be followed after a dangerous event has been managed according to the Incident Management Procedure [G00.OMO11.M15880.NG.0001.*].

2 Scope, Distribution & Access

This procedure applies to all dangerous events accidents and incidents affecting the ERL – CRS train service or infrastructure.

This procedure is available to all Operations and Maintenance staff. Access to the document is given to all E-MAS Operations and Maintenance staff via Electronic Document Management System (EDMS). Employee without EDMS user access can retrieve this procedure via E-MAS Safety & Security Department portal.

3 Definition / Abbreviation

Terms	Description
HOD	Head of Department
PIC	Person In-Charge
SAS	Safety and Security Department
ACT 715	Land Public Transport Act (amendment) 2018
Agency	Land Public Transport Agency (APAD)
Dangerous event	An incident or accident resulting in potential or actual injury, death or damage to infrastructure
Accident	An unplanned or uncontrolled event giving rise to death, ill health, injury or damage to property
Accidental Death	Death where there was no intention on the part of the deceased to take their own life
Incident	An unplanned, uncontrolled event, which under different circumstances could have resulted in an accident
Emergency Services	BOMBA, police, ambulance or other services
Root Cause(s)	Underlying factors leading to an accident or incident
DEIR	Dangerous Event Investigation Report

Other abbreviations can be referred from Abbreviation & Glossary Procedure (G00.OMO.M15110.NA.1003.)*

*Note: * Refers to the latest revision*

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4 Introduction

4.1 Duty

E-MAS has the duty under the Malaysian Laws, Land Public Transport Act (amendment) 2018 [ACT 715] Part VI, to investigate and report on accidents or incidents occur.

4.2 Liability and Claims

Investigations are not a means of establishing liability. However it must be recognised that the investigation provides information, which may ultimately form an input into a legal investigation.

4.3 Policy

E-MAS has in place, management structures and arrangements, which enable:

- accidents and incidents to be reported in accordance with statutory requirements defined in the ACT 715;
- assessment of the circumstances of accidents or incidents;
- identifying a person (the Competent Person) with overall responsibility for investigations and inquiries;
- appointing an investigation team or establishing any inquiry arrangements necessary;
- gathering information, data downloading, diagrams, layouts, audio & visual recordings or/and any other form of informative evidence;
- gathering technical and operational reports;
- preserve the evidence;
- establishing comprehensive plans for all subsequent investigations on or off site;
- involving specialists and determining arrangements for testing of evidence by approved laboratories;
- initiating investigation and determination of the immediate and root cause(s);
- corrective measures minimizing the probability of recurrence;
- development of the investigation and inquiry process;
- the production of investigation and inquiry reports;
- maintenance of records of investigations and inquiries.

These arrangements must take into the account of the need for co-operation with other Railway Operators or authorities, which maybe involved in the accident or incident.

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5 Form of Investigation

5.1 Responsibility

The HOD - SAS shall assess whether the circumstances of a dangerous event necessitate an investigation. Other relevant E-MAS HOD shall provide assistance as required.

5.2 Investigation

An investigation will be necessary:

- when the cause of a dangerous event is not known;
- when the cause of a dangerous event is known, an investigation may be necessary to achieve the Investigation Objectives listed in section 5.3;
- in cases of accidental death;
- in circumstances involving multiple injuries resulting from a serious train accident (e.g. derailment, collision, fire etc);
- for other accidents where a public inquiry or Agency inquiry is likely.

5.3 Investigation Objectives

The objectives of an investigation are to:

- establish the full facts inclusive the contributing factors,
- determine the immediate and root cause(s),
- assess compliance with ACT 715,
- question whether methods of working are safe,
- determine whether specific actions are necessary to avoid recurrence,
- determine whether changes are necessary to training, supervision instructions, maintenance schedules, equipment used, etc,
- question whether there are underlying weaknesses, e.g. in the organisation, safety management plan, operations or maintenance,
- devise corrective measures aimed at prevention of recurrence.

Investigations shall pursue the detail required to establish and clearly understand the underlying cause(s) of a dangerous event.

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5.4 Records

Comprehensive records of investigations must be made and retained. These records must contain full details of evidence, discussions and considerations as well as relevant dates and times both of the circumstances and investigation process.

6 Investigation Circumstances

The following are examples of dangerous events necessitating investigation: -

- Train collision, derailment, separation or fire;
- Collapse of or damage to infrastructure;
- Signal Passed at Danger;
- Personnel injured;
- Passenger or member of the public injured;
- Near-missed.

7 Preparing an Investigation Report

The investigation report must: -

- name the person leading the investigating team;
- state the purpose of the investigation;
- commence as soon as practically possible and be completed with the report and recommendations distributed within a maximum of 3 weeks from the date of the dangerous event. In exceptional circumstances more time may be needed to complete the process. In these circumstances the extension supported by a reason, must be agreed with general management, however an interim report may be necessary, which should include a timescale for completion.

The investigation report may need to be revised or rewritten as the investigation progresses so as to encompass other aspects not previously considered.

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7.1 Content of Report

The **Dangerous Event Investigation Report (DEIR)** form is attached as Appendix A. Additional documents such as diagrams, layout, system downloads, and voice recording extraction or witness statements can be attached but must be listed in the report form.

The main emphasis of an Investigation report shall be on: -

- events leading up to the dangerous event cause(s);
- immediate and root cause(s);
- technical and contributing factors;
- whether or not rules and regulations were complied with or are deficient;
- whether any action has been taken to prevent a recurrence;
- adequacy of staff training;
- Recommendation(s)/suggestion(s) to avoid recurrence.

The timescale for completion of follow up actions and further investigations should also be stated.

Other items may also need to be included in the report, such as:

- an estimate of the costs involved (repair, replacement, temporary hire, etc).
- detail of other losses, e.g. delays to services, cancellations.
- the activities of external agencies e.g. Emergency Services and specialist support.

7.2 Signatures

All investigation report must be in writing and must be signed by: -

- the person preparing the report and carrying out the investigation;
- the HOD - SAS; and
- the Chief Executive Officer to release of the report.

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8 Investigations

8.1 Cause Known

All external organisations involved, such as BOMBA, Police, Civil Defence or other railway operators, involved in the investigation must agree upon the identified cause(s) and any necessary remedial action, otherwise the individual conducting the investigation must note differences in opinion on the report.

8.2 Cause Not Known or Immediately Apparent

The HOD - SAS must identify a person or establish an investigation team with the objectives identified in Section 5.3 that is responsible for the following: -

- Obtaining further information and evidence by:
 - ✓ visiting the site of the dangerous event;
 - ✓ requesting a further reports or information from person(s) and department involved or witnesses;
 - ✓ requesting any data downloading, diagrams, layouts and audio & visual recordings;
 - ✓ interviewing the person(s) involved;
 - ✓ seeking specialist/third parties advice or additional technical assistance.

- Arranging for specialist tests, technical examinations or investigations to be carried out. In this case the person leading the investigation must set specific criteria detailing the parameters to be covered. Where laboratory testing is involved the criteria for the test must be identified in a plan agreed by the lead organisation with the test laboratory. This plan may need to be agreed with other organisations, which may be involved, i.e. BOMBA, and Department of Occupational Safety & Health (DOSHS).

- Preparing a report identifying the cause and any other issues raised by the investigation.

- Ensuring that all organisations involved in the investigation are in agreement with the identified cause(s) and any necessary remedial action taken.

The investigation report must contain the names of the investigation team members, together with their Job titles and indicate that they are in agreement with the conclusion. The report of the investigation must be signed.

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8.3 Report to the Police and Land Public Transport Agency

If a dangerous event was an accident; then it must, as soon as possible, be reported to the officer in charge at the nearest police station and reported in writing to the Agency, within 24 hours. The related Investigation Report must also be forwarded to the Agency.

In the sense of the Law of Malaysia, ACT 715, the following accidents have to be reported to the police and the Agency:

- Accidents attended by loss of human life or grievous hurt to any passenger upon any train or to any person engaged in the working of the railway, or
- Accidents causing serious damage to property.

8.4 Safety and Health Committees

The investigation reports are tabled in the Safety and Health Committee meetings when the event is externally reportable or results in an accident.

Refer to The Safety Management Plan (ERL.OMG.M18250.0001.*) for more information on the roles and responsibilities of the Safety and Health Committee.

9 Witnesses

9.1 Responsibility

HODs are responsible to arrange attendance of their staff for investigations, when required, notice will be forwarded via email.

Where a witness's evidence may prove critical to the investigation, but the witness is unable to attend or give evidence at an inquiry owing to injuries sustained in the accident or ill health, it may be desirable to interview the witness, when sufficiently recovered, in hospital or at home. In such circumstances, the HOD of Safety and Security should make appropriate arrangements with the Employer/HOD concerned.

10 Dissemination of Information and Workflow

This section describes the flow of information during the investigation into a dangerous event.

Before this procedure is followed, it is planned that an incident will have already been managed according to the **Incident Management Procedure [G00.OMO.M15880.NG.0001.*]**.

The initial information could be obtained from the OCC Journal Notification, reports by person(s) involved, technical and operational reports, audio & visual recordings, data downloads and any other form of informative evidence.

*Note: * Refers to the latest revision*

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Incident Investigation

The HOD - SAS has to: -

1. Obtains the Incident Report, Incident Work Sheet and OCC Journal;
2. Investigates incident using following: -
 - staff reports; giving comments of the incident from the view point of the involved staff;
 - eyewitness reports; from people who happened to see the dangerous event;
 - reports on Technical Condition; commenting the status of technical installation at the time of the dangerous event;
 - system Recorded Data; data logged by the TMS, voice recorder, train fault logs, etc., at the same time of the dangerous event;
3. Generate DEIR and make available to the HOD of the respective department of which the incident is related to;
4. Finds an agreement with the HOD of the respective department of which the incident is related to;
5. Recommend for corrective actions (if necessary);
6. Generates a document number for the DEIR;
7. Submit Report to the CEO;
8. Distributes Report.

The HOD of the respective department of which the incident is related to, has to:

1. Co-operates with HOD - SAS in the investigation process;
2. Contributes to DEIR.

Safety and Health Sub-Committee may to be established: -

1. If there is a major incident;
2. If the event is externally reportable.

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10.1 Corrective Measures & Effectiveness

The Safety and Health Committee shall follow up on corrective measures identified during the investigation.

The related HOD shall be informed of the corrective measures and is responsible to ensure they are properly implemented.

Corrective measures may be in the form of: -

- modification to systems or components;
- additional technical or awareness trainings;
- revising of procedures, manuals or instructions or all;
- posting of signages;
- refresher or retraining, re-examination and observation for a duration which is determined by the department concerned;
- disciplinary action;

Based on the investigation report, the respective HOD shall evaluate whether or not it is necessary to initiate action to ensure that the similar incident will not re-occur. If there is a need for corrective action to be taken, the HOD shall take into account the report's findings and recommendations (**DEIR - Section D, E, and F**) or determine the appropriate corrective action to address the root cause of the incident.

Once the appropriate corrective action has been determined, the HOD shall immediately implement the action within 3 months from the release date of the DEIR. The immediate corrective action implemented by the assigned personnel shall be closed and recorded in **Section K** of the same report and submitted to SAS for record.

In **Section L**, the investigator shall monitor and verify the effectiveness of the corrective action taken, if it is found effective, the DIER shall be signed off by the responsible person; if it is found not to be non-satisfactory, the investigator shall issue a reminder or new recommendation which action to be taken within the time frame agreed with the respective HOD/PIC.

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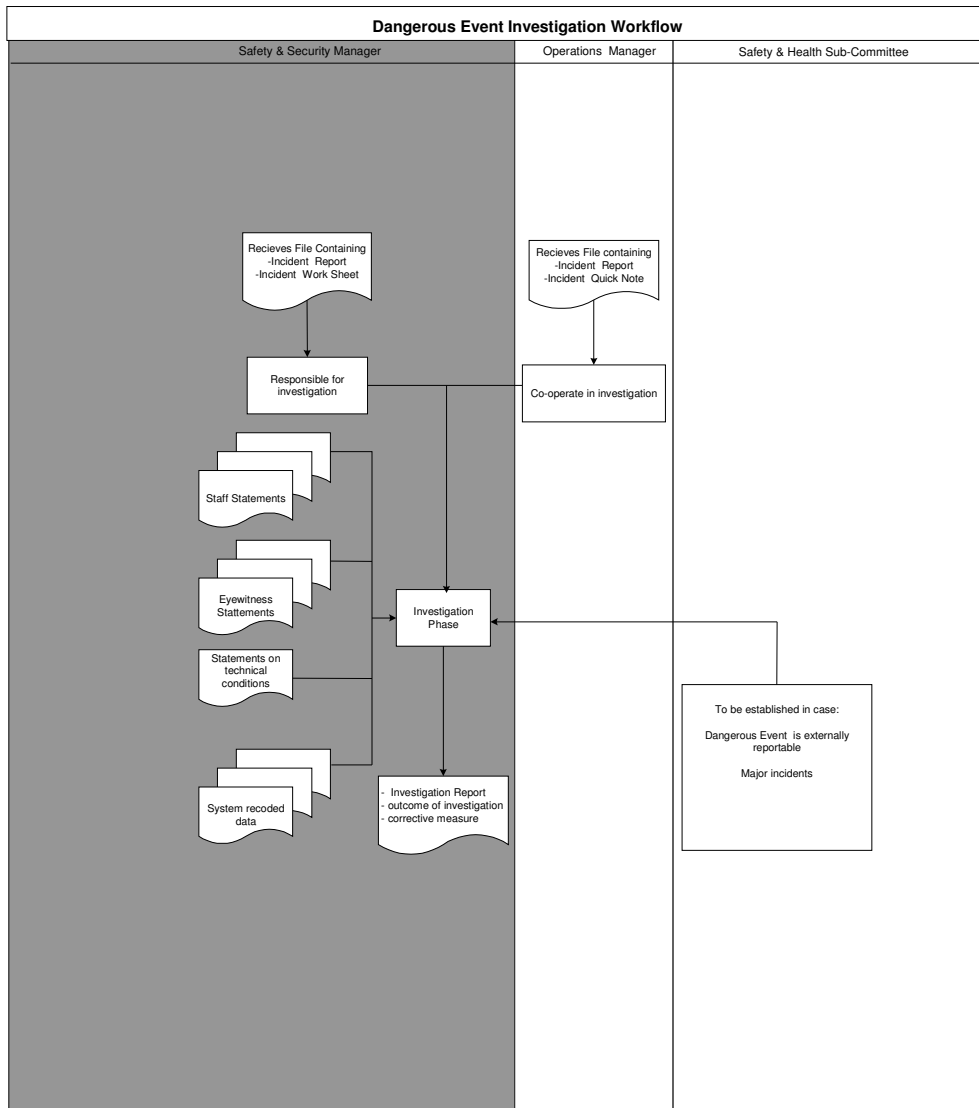
11 References

The latest versions of the following procedures are to be referred as required:

- Emergency Response Plan & Incident Command System [G00.OMZ.M11451.CB.0001*]
- Safety Management Plan [OMZ.ERL.M11451.0005*]
- Incident Management Procedure [G00.OMO.M15580.NG.0001.*]
- Record Management Procedure, [G00.OMD.M11100.CA.0001.*]
- Laws of Malaysia, Land Public Transport Act 2010 [ACT 715]
- Occupational Safety and Health Committee Regulations, 1996

Note: * Refers to the latest revision

Figure 1 – Dangerous Event Investigation



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Appendix A

Dangerous Events Investigation Report Form (G00.OMZ.M15880.RW.*)

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**Dangerous Event Investigation Report
DEIR Report Form**



Passenger Service Affected:	Yes	No	Failure Notification No:	#		
Date of Event:			Time of Event:			
Weather Conditions:			Location of Event:			
Event Reported By:			Action Taken By:			
Category of Event:	SPAD*	Near Missed	Hit/Collide	Derail	Fire / Explode	Others
Personnel Involved:						
Persons Injured:						

Note: *Signal Passed At Danger (SPAD)

A) Purpose of the Investigation:

To investigate the root cause of this incident and propose recommendation to prevent reoccurrence of similar incident.

B) Description of Event:

C) Timeline & Sequence of Events:

1. hrs -
2. hrs -
3. -
4. -
5. -

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D) Investigation Findings & Observation:**E) Root Cause & Contribution Factors:****F) Recommendation and Conclusion:****G) Estimate of Costs and Description of Damages:****H) Effects on Train Service:****I) Activities of Other Agencies:**

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J) Attachments:

1. OCC Journal dated {DD-MM-YY} (Notification #number)
2. Incident Report by {Name & ID}
3. Department Report - Operations (OMO.OMG.M15880.*)
4. Department Report - Technical/Maintenance Dept (OM*.OMG.M15880.*)
5. Download - TMS Timeway Diagram {DD-MM-YY}
6. Download - ATP {vehicle number} on {DD-MM-YY}
7. Download - CCU, BCU & TCU {vehicle number} on {DD-MM-YY}
8. DEIR - Voice Recording Extraction on {DD-MM-YY}
9. DEIR - Interview Form
10. DEIR - Incident Location Layout
11. Procedure - Clause {number},
12. Training Attendance {Name & ID}
13. Summary of Maintenance Schedule / Maintenance Record
14. Police reports - {DD-MM-YY}

Released:		CEO		
Checked:		HOD of Safety and Security		
Investigated by:		Investigator(s)		
		Investigator(s)		
	Name	Designation	Date	Signature

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K) CORRECTIVE ACTION (To Be Completed By HOD)

Based on report and recommendation in **Section E** and **F**:

Corrective Action Taken and Completed:

Yes **No** [PIC/HOD to provide justification]

Evidence of action/implementation:

Other remarks (if any):

Completion Date:

Action Taken by;

Note:

- *Please use additional sheet if required.*
- *Corrective action shall be completed within 3 months from the release date of this report.*

Name & ID:

Date:

L) EFFECTIVENESS OF CORRECTIVE ACTION (To Be Completed By Investigator)

Corrective Action Taken and Completed:

Yes **No** [Investigator to issue new reminder/recommendation]

DEIR signed off:

Yes **No** [Investigator to issue new reminder/recommendation]

Completion / Follow-up Date:

Investigator;

Name & ID:

Date: