EMESRT

Earth Moving Equipment Safety Round Table

EMESRT.ORG

VEHICLE INTERACTION OPERATIONAL EFFECTIVENESS BASELINE VALIDATION

PROCESS GUIDE STAGE 1 AND 2

PREPARATION AND DELIVERY OF A SITE BASELINE VALIDATION WORKSHOP



WORKING WITH INDUSTRY SINCE 2006.

DOCUMENT MANAGEMENT

1. VERSION HISTORY

Version 1 of the EMESRT Vehicle Interaction Operational Effectiveness Baseline Validation Process Guide Stage 1 and 2 - preparation and validation of a site baseline validation workshop was developed and published by EMESRT in September 2025.

2. DISCLAIMER

While every attempt has been made to validate the contents of this process guide, the content has been collated from industry leading practice and therefore may change over time. For this reason, EMESRT reserves its right to update and re-issue the guide as industry practice evolves.

3. CONDITIONS OF USE

EMESRT has an ambition to reduce the exposure to unwanted health and safety hazards from operating and maintaining mobile earth moving equipment. This is achieved by sharing leading practice information that can be referenced by users and designers when seeking to reduce the level of unwanted exposures to personnel. Connecting through a community collaboration of; end users, OEM's, researchers, and third-party suppliers it allows a deep understanding of the problems needed to be addressed to support industry level improvement.

3.1 TRANSLATIONS

This guide was developed and reviewed in English only. If the guide content, in part or in its entirety is translated, only the English version published by EMESRT is the approved version.

3.2 USAGE

- EMESRT makes the process guide accessible to all of industry at no cost, it is not intended for sale or rent, in part or in its entirety, in any form including print, digital or other formats
- No financial gain is to be made by using this guide in part or in its entirety
- Conditional use requests can be addressed to enquiries@emesrt.org

Copyright © 2025 EMESRT. All rights reserved.

TABLE OF CONTENTS

1. Introduction	4
2. About EMESRT	5
3. Background	6
4. Definitions and Glossary	8
5. Process guide: Stage 1 - Site baseline preparation	10
6. Process guide: Stage 2 - Validation workshop	12
7. The process: Section 1 - Facilitator checklist	17
8. The process: Section 2 - Stage 1: Prepare the baseline	22
9. The process: Section 3 - Stage 2: Validation workshop	35
10. Workshop validation output report development	52
11. Key messages to facilitators	54
12. Preparation checklist	55
13. Workshop posters	56

1. Introduction

The EMESRT Vehicle Interaction Baseline Operational Effectiveness Validation process is a comprehensive approach designed to validate the relevance and reliability of operational activities to enable safe and productive operation.

The process provides a structured and integrated starting point for vehicle interaction improvement.

This Process Guide provides both an overview and detailed guidelines for preparing and delivering the Vehicle Interaction Site Baseline Operational Effectiveness Validation workshop through a two stage process:

- Stage 1 outlines the preparation required prior to the site validation workshop
- Stage 2 provides detailed guidance for delivering the site baseline validation workshop

The Process Guide has been developed to assist operating sites in the resources industry to deliver vehicle interaction improvements.

Although this Guide focuses on vehicle interaction, it has been used in other business processes, e.g. tyre and rim management improvement, mobile equipment fire management improvement, mine related off site road transport, etc.

2. About EMESRT

EMESRT is a global 'safety by design' initiative established by mining companies to identify and close the functional performance expectations gap between earth moving equipment users and equipment designers.

Formalised in 2006, EMESRT is a global initiative involving major mining companies and enables a 'common voice' of the mining industry to be heard by designers.

EMESRT engages with key mining industry Original Equipment Manufacturers to advance the design of equipment and processes to improve safe operability and maintainability beyond Standards.

Throughout its history, EMESRT, a mining company membership-based entity, has focused on health and safety problems of significant consequence to the people in the mining industry.

EMESRT is a respected high-influence global organisation that delivers industry-level understanding of complex health and safety problems. Its effectiveness rests on trusted relationships with OEM's and third party suppliers. This trust is vital to sustain EMESRTs relevance and ability to influence the design outcomes. EMESRT interacts by genuine two-way engagement with all stakeholders.

Vision

A mining industry free of fatalities, injuries and occupational illnesses associated with operating and maintaining earth moving equipment.

Purpose

Accelerate development and adoption of leading practice designs to minimise the risk of health and safety through a process of Original Equipment Manufacturer, contractor and user engagement.

Key Principles

- Design beyond standards
- Balancing engineering and behaviour (human factors)
- Recognising the value of task-based design review
- Appreciate that the OEM does it better with the end user involved
- Open genuine two-way engagement is key

3. BACKGROUND

According to the International Council on Mining and Metals (ICMM) member incident data, each year many mining industry fatalities are attributable to unwanted vehicle interactions with a significant portion involving pedestrians in underground operations.

Since 2013, EMESRT has been working on the vehicle interaction improvement project.

The EMESRT methodology is to focus deeply on defining the problem, getting a common understanding with a large group of stakeholders, then go to the designers and provide a common view of the problem with the intent that designers see it as a business opportunity in providing solutions for all or part of the problem.

ICMM LEADING SITES PROGRAM

Launched in 2022, the ICMM Leading Sites program aims to improve the mining industry's vehicle interaction performance. Notably, it seeks to improve safety through collaboration and the sharing of leading practices. It's a pivotal tool for driving continuous vehicle interaction improvement in the mining industry.

One significant aspect of the ICMM Leading Sites program is its partnership connection with EMESRT.

The program provides a platform for transparent and meaningful two-way dialogue between mining companies, OEMs and technology providers. This dialogue helps identify and address equipment-related hazards.

A key platform of the leading sites program is the Capable Solution definition, which sets out three key principles of a vehicle interaction improvement program.

What is meant by a vehicle interaction 'Capable Solution'

- A Capable Solution delivers better vehicle interaction control performance by improving the quality of decision-making from task execution through to mine operations and design
- A Capable Solution considers relevant aspects of the operating environment, production requirements and equipment design
- Where Technology is a part of a Capable Solution, it is operationally integrated with existing controls

EMESRT recognises that improving vehicle interaction operational activities is complex and interconnected. Leading practice is to establish the effectiveness of fundamental operational activities before being able to effectively implement higher-level activities (see Figure 1 and 2).

Figure 1: The EMESRT Operational Effectiveness model.

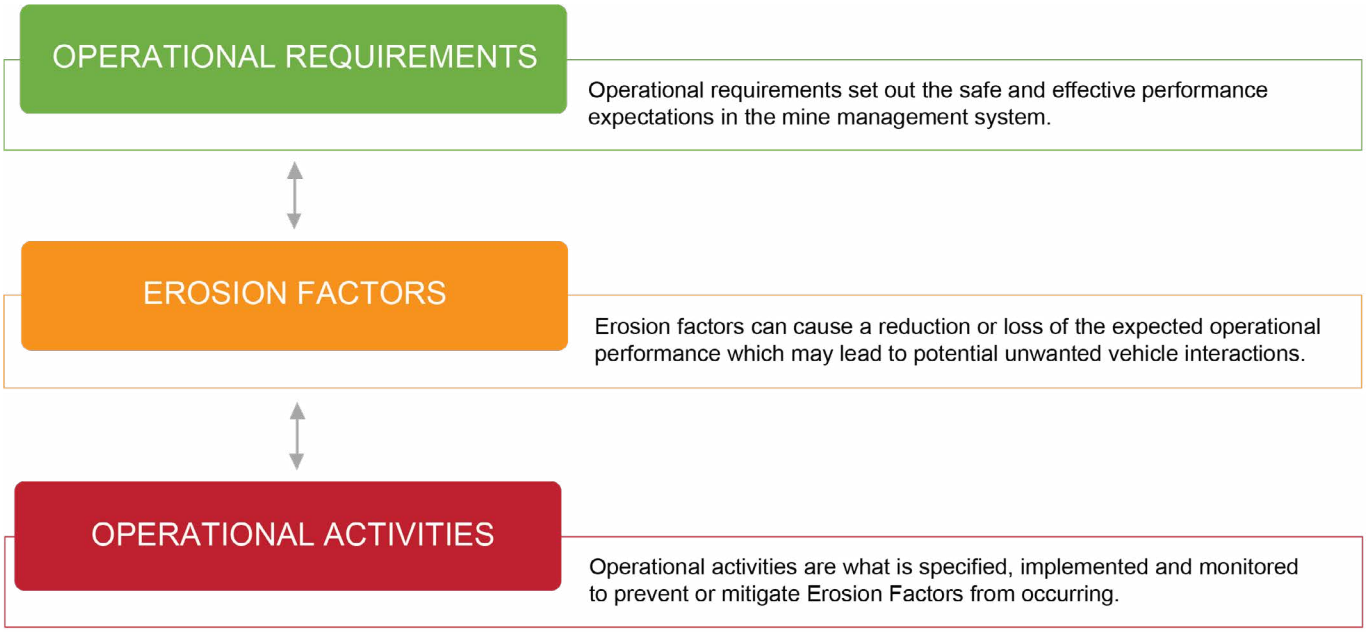
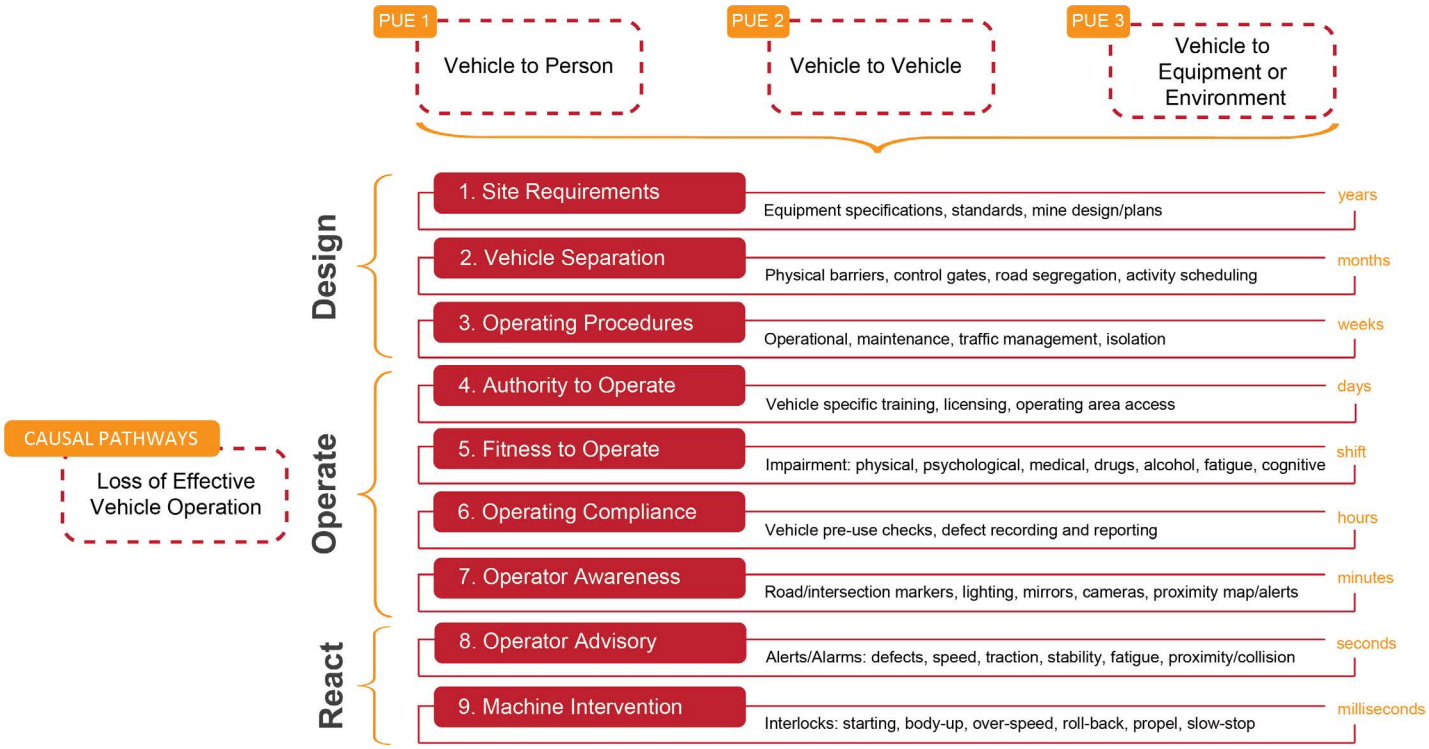


Figure 2: The EMESRT Vehicle Interaction 9-Layers of Defence model with examples of operational activities.



4. DEFINITIONS AND GLOSSARY

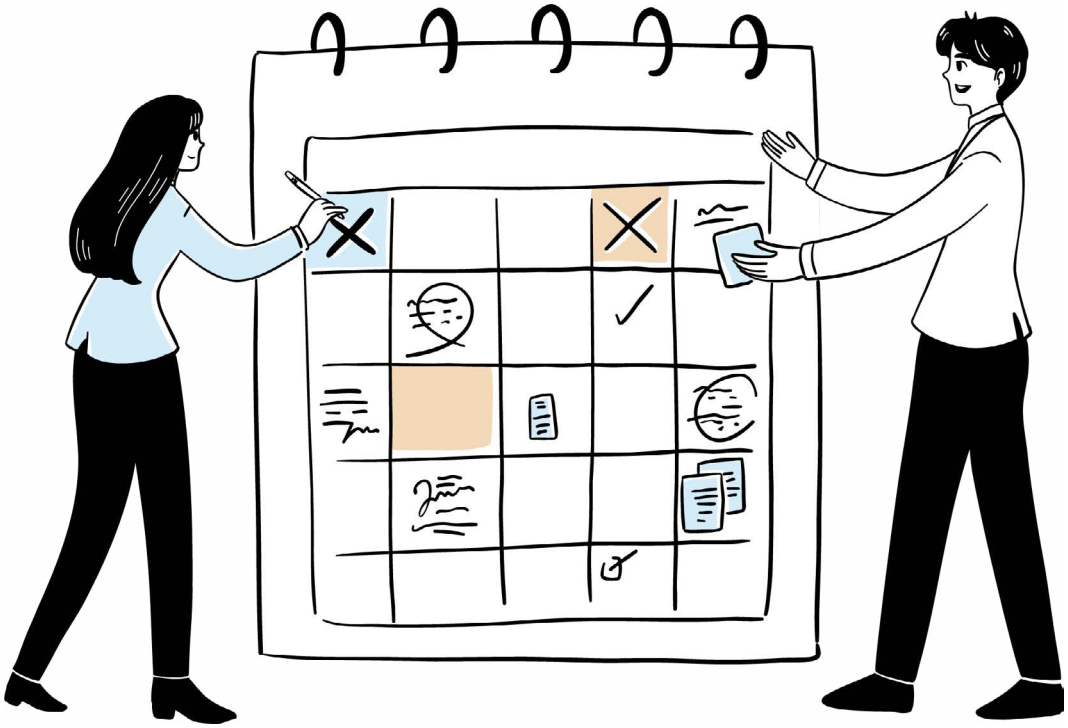
TERM	DEFINITION
Classification type	A classification type is an act, object or technological system that of itself arrests or mitigates the event and is measurable, specifiable and auditable.
EMESRT	The Earth Moving Equipment Safety Round Table.
Erosion Factors	An Erosion Factors causes adverse drift in maintaining the expected operational performance which may lead to potential unwanted vehicle interactions.
ICMM	The International Council on Mining and Metals.
Management Sheets	A printed output from the Operational Effectiveness analysis. Spreadsheet is organised by Operational Requirements, listing Erosion Factors and Operational Activities. The Management Sheets are key resources for small group work during the Vehicle Interaction Baseline Operational Effectiveness Validation workshop.
Operational Activities	Operational activities are what is specified, implemented and monitored to prevent or mitigate Erosion Factors from occurring.
Operational Effectiveness	Operational Effectiveness is an EMESRT comprehensive approach designed to validate the relevance and reliability of operational activities to enable safe and productive operations. This process provides a structured and integrated starting point for vehicle interaction improvement.
Operational Requirements	Operational requirements set out the safe and effective performance expectations in the mine management systems safe and effective site operations. An operational requirement can be classified as: ▪ An **Act is** a human action, to do something, e.g., operator maintains adequate clearance distances ▪ An **Object is** a material thing, an engineering device that works independently of human action, e.g., haul road berm ▪ A **Technological System** is a combination of an act and an object which changes state to provide information for the operator to act on, e.g., a low steering or brake pressure alarm An operational requirement is specifiable, measurable and auditable.

TERM	DEFINITION
Validation Workshop	The validation workshop follows this iterative process: 1. Review the Operational Requirements and confirm that it is relevant to safe and productive mobile equipment operations for this site 2. Review each Erosion Factor related to the operational requirements and how the erosion factors can compromise the Operational Requirement state being reviewed 3. Then review each linked Operational Activity to confirm that it can prevent or mitigate the Erosion Factor from compromising the Operational Requirement state 4. Based on operational practice review and update details on how the Operational Activity is: a. Specified b. Implemented c. Monitored
VI	Vehicle Interaction.



5. PROCESS GUIDE STAGE 1

The Process Guide Stage 1 provides an overview and details for the preparation of the EMESRT Vehicle Interaction Site Baseline Operational Effectiveness Validation workshop.



SITE BASELINE PREPARATION

OBJECTIVES

The objective of Stage 1 is to prepare a site Operational Effectiveness Baseline of current operational activities that capture details from:

- Work process documentation – procedures, standards, work instructions, etc
- Records of operational practice e.g. equipment pre-start and maintenance checks, shift communication logs, training assessments, equipment operation authorisation, etc
- Interviews with knowledgeable and experienced site personnel
- Reviews of relevant site and sector incidents
- External expectations - legal and company
- Validation outcomes will fall into the following categories:
  - What is expected is being performed and monitored effectively
  - What is specified is inadequate and needs improvement to be effective
  - What is specified is adequate, but its implementation is inadequate to be effective
  - What is specified and implemented is adequate but is not monitored adequately to identify drift from effective performance

OUTPUTS

The outputs from Stage 1 are as follows:

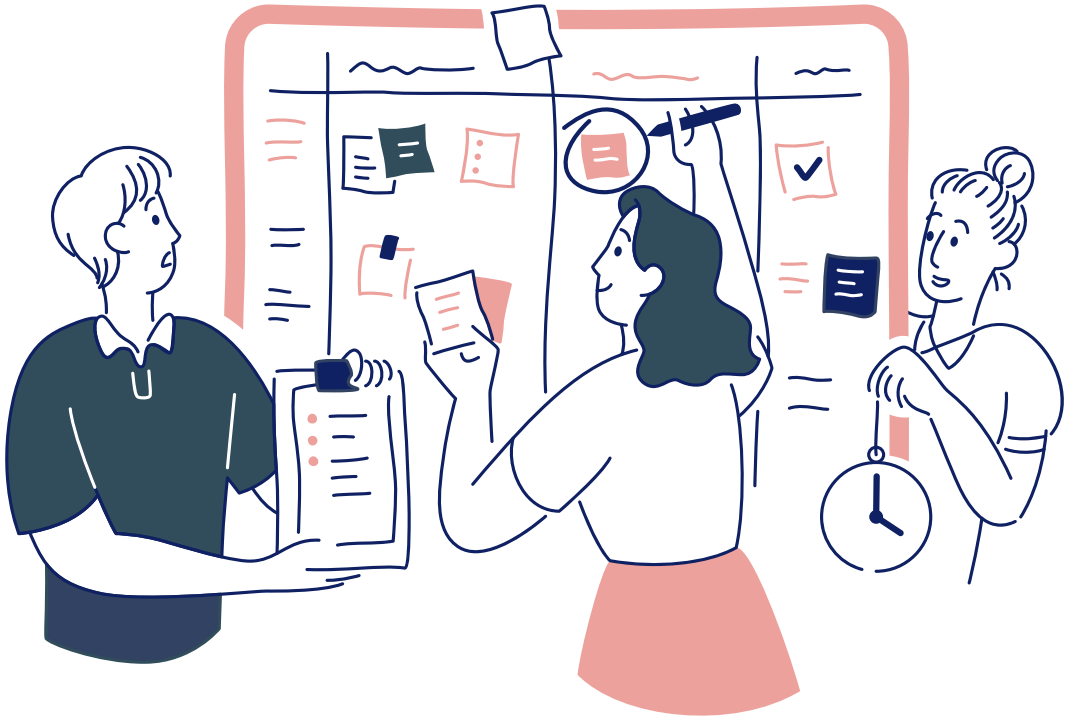
- Version 1 of the site Operational Effectiveness Baseline, prepared from the Mapping Template, that includes relevant site content identified with specific references, notes, assumptions, and variations to be validated by workshop participants
- A list of all documents reviewed noting those referenced in site baseline and those that were not relevant
- A list of the experienced and knowledgeable personnel who have contributed to the baseline
- A register of relevant legislative requirements
- A review of site relevant incidents with cross references to contributing Erosion Factors
- Validation workshop management sheets organised around the Operational Requirements

> Do not underestimate the time and resources required to complete this preparation step. Inadequate preparation will result in suboptimal validation workshop outcomes.



6. PROCESS GUIDE STAGE 2

The Process Guide Stage 2 outlines the necessary steps to effectively coordinate and prepare for the validation workshop, who should be involved, specifying participant roles, responsibilities, and preparatory requirements.



VALIDATION WORKSHOP

OBJECTIVES

The objective of Stage 2 is to review and validate version 1 of the site Vehicle Interaction Operational Effectiveness Baseline prepared during Stage 1.

OUTPUTS

The key Stage 2 workshop outputs are as follows:

- Version 2 of the validated site Vehicle Interaction Operational Effectiveness Baseline
- A report that identifies opportunities for improvement for current vehicle interaction operational activities and systems
- Build internal capability to effectively coordinate and prepare for future validation workshops

POST WORKSHOP

Use the validation workshop opportunities for improvement report to:

- Identify and group the opportunities for improvement, e.g. operational planning improvements, personnel support improvements, etc
- Undertake internal review to identify and prioritise high-impact actions
- Consider forming an internal working group to implement and manage significant impact-actions
- Consider integrating recommendations from the group into existing systems
- Consider planning for a second phase of the baseline validation process to monitor and evaluate the effectiveness of implemented recommendations

> A minimum four-week lead time is required to coordinate and prepare for the Stage 2 validation workshop.

TIMINGS

Stage 1 of the site Baseline Operational Effectiveness preparation should be scheduled to begin at least four weeks before the validation workshop. This minimum lead time allows for:

- Sourcing and mapping work process documentation
- Sourcing and mapping operational practice records (evidence that work processes are being applied and their design is satisfactory)
- Reviewing site and sector relevant incident history
- Identifying and mapping external to site expectations - legal and company
- Reviewing progress with knowledgeable and experienced site personnel

This minimum four-week lead time is also required to coordinate and prepare for the Stage 2 Validation Workshop by:

- Briefing senior managers about the vehicle interaction improvement process and objectives and their role
- Confirming, inviting and briefing participants
- Selecting and preparing a suitable workshop venue

The Stage 2 validation workshop can take up to two full days with all participants. This duration is dependent on the level of the preparation of the baseline materials. Selected workshop participants will attend for a further day to prepare a draft improvement plan for senior management review. It is worth noting that the potential two full days apply to the vehicle interaction workshop.

This may vary when applying the approach to other business processes, e.g. tyre and rim management improvement workshop might only take one day.

Preparation of a report of the workshop process and outcomes typically takes a further three to five days. This work can be undertaken by either the workshop facilitator, project manager or both.

> Brief senior leaders on their role for operational effectiveness Stage 1 and 2 and select participants who are influencers and natural leaders.

ROLE OF SENIOR LEADERS

Brief Senior Leaders on their role for operational effectiveness Stage 1 and 2 covering:

- The 'Company' Operational Effectiveness Improvement Strategy
- Details of the Site Operational Effectiveness Improvement Plan
- An overview of the EMESRT operational effectiveness improvement approach as an improvement process (the approach was originally developed by an EMESRT member company in 2015 and subsequently trialed and validated with the wider EMESRT membership)
- Stage 1 operational effectiveness mapping process
- The timing and structure of the Stage 2 validation workshop

SELECTING WORKSHOP PARTICIPANTS

Workshop participants should be representative of the workforce who manage operational hazards.

The following roles should be represented:

- Mobile equipment operators
- Supervisors of mobile equipment operators
- Equipment maintainers
- Technical staff, e.g., engineering
- Workforce representatives with health and safety skills
- Risk and safety team members
- Training personnel
- Senior managers / decision makers
- Others, e.g. contractors with a relevant presence on the site

Select participants who are influencers and natural leaders. Confirm that there are enough senior leaders to support each small breakout working group planned.

A successful workshop requires a cross section of the workforce with a minimum of 12 cross-sectional personnel, usually required to cover the roles, and the process can be used for larger groups with element specific breakout groups of 4-6 working effectively.

SUPPORT MATERIAL

STAGE 1: BASELINE PREPARATION

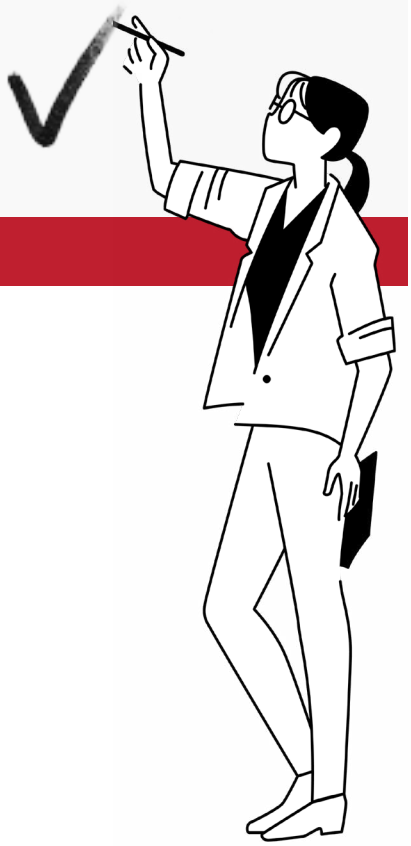
- Operational Effectiveness Mapping Template
- This Process Guide

PHASE 2: VALIDATION WORKSHOP

- Workshop Operational Effectiveness Management Sheets for A0 printing (841 mm x 1189 mm, 84.1 cm x 118.9 cm or 33.1 inches x 46.8 inches)
- Workshop posters for printing
- This Process Guide
- Workshop Operational Effectiveness Management Sheets – master spreadsheet for updating by workshop participants

POST WORKSHOP OPERATIONAL EFFECTIVENESS RESTORE AND MAINTAIN PLAN

- Opportunities for improvement reporting template
- Version 2 of the Operational Effectiveness Baseline template
- Report structure template
- Including suggested Appendices



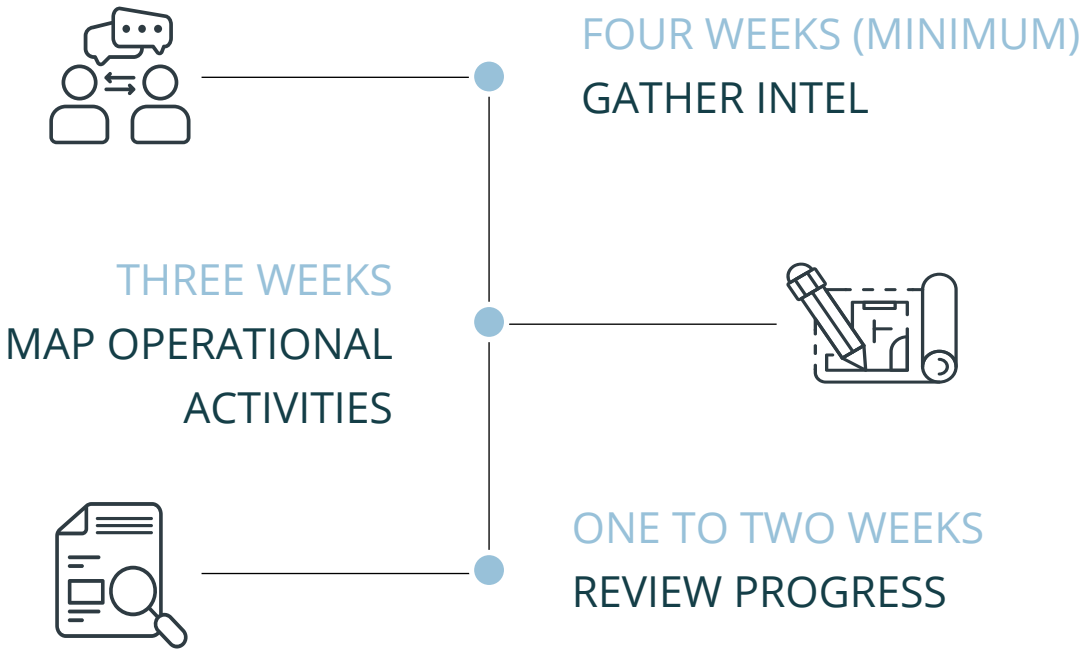


7. THE PROCESS: SECTION 1

FACILITATOR CHECKLIST

Use the table columns as a checklist to coordinate preparation of Stage 1: Vehicle Interaction Baseline Operational Effectiveness Validation and Stage 2 Validation Workshop.

TIMELINE OF ACTIVITIES BEFORE WORKSHOP

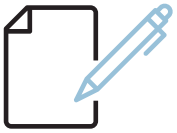


DETAILS: TIMELINE OF ACTIVITIES BEFORE WORKSHOP

Operational effectiveness baseline preparation	Validation workshop
1. Minimum of four weeks before workshop	
Commence sourcing and mapping work process documentation including: ▪ Procedures ▪ Task instructions ▪ Operational records ▪ Training information - process and records ▪ Incident experience ▪ Standards ▪ Legislative requirements ▪ Company requirements	Announce Stage 1 project commencement through a note from senior managers.
2. Three weeks before workshop	
Continue to source and map operational activity documentation into the Operational Effectiveness Mapping template.	Confirm that the venue for the workshop is adequate with space for large group work (all participants) and breakout areas for at least four small groups. Select participants.
3. One to two weeks before workshop	
▪ Review progress with knowledgeable site personnel ▪ Workshop participant pre-work: ◦ Two weeks before workshop distribute the EMESRT Vehicle Interaction 9-Layers of Defence Guide to workshop participants ◦ Request participants to review the content in preparation for workshop	Invite participants.

Preparation is key to delivering a successful baseline validation workshop.

Operational effectiveness baseline preparation	Validation workshop
4. Two to five days before workshop	
Review of site operations by facilitator. Discuss operational effectiveness baseline map with knowledgeable personnel, amend and update as required. Prepare spreadsheets for each operational requirement operating state for: ▪ Printing as validation workshop operational Effectiveness Management Sheets ▪ A shared resource for small group review work	Confirm venue resources and support: ▪ Flip charts ▪ White boards ▪ Wall space to hang operational effectiveness management sheets ▪ Projector and screen ▪ Large group work area – if possible, work without tables ▪ Small group break-out areas for at least four groups ▪ Amenities ▪ Tea coffee ▪ Lunch
5. One day before workshop	
Print validation workshop posters and baseline operational effectiveness management sheets in A0 size. Print reference material covering erosion factors and operational activities input details.	Prepare the room: ▪ Hang posters ▪ Set up large group area – recommend circle of chairs set up
6. Day of workshop	
During the introduction highlight the Stage 1 operational effectiveness baseline mapping input that has been completed to make the workshop a success covering: ▪ Number of documents reviewed ▪ External expectations mapped ▪ Interviews, etc Challenge the group to 'mark this homework' and identify gaps and opportunities.	Welcome participants: ▪ Introduction to the workshop ▪ Point out any housekeeping rules and safety procedures ▪ Point out tea and coffee areas ▪ Point out rest-room areas ▪ Any other information relating to venue requirements ▪ Training in the validation process ▪ Commence the workshop



NOTES

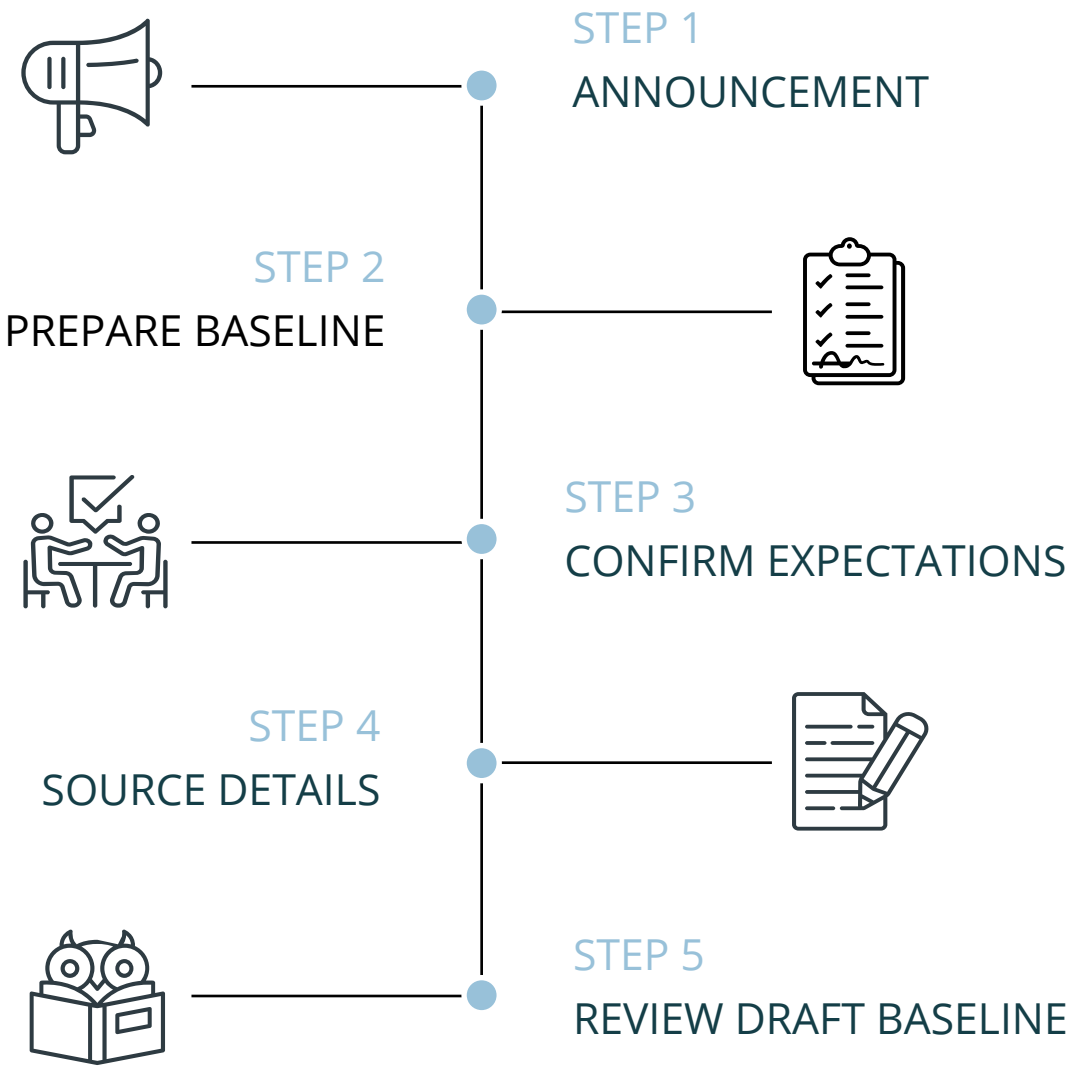


8. THE PROCESS: SECTION 2

STAGE 1: PREPARE THE BASELINE

This section provides a step-by-step description of the process to prepare a Stage 1: Operational Effectiveness Baseline.

TIMELINE OF ACTIVITIES BEFORE WORKSHOP



Step 1: Announce Stage 1 of the operational effectiveness improvement.

Activity	Responsibility
It is recommended that senior site management launch the site vehicle interaction operational effectiveness improvement project with a note to relevant managers and functional leads that describes both Stage 1 and Stage 2 process steps. The note should confirm: ▪ A project intent to review and improve site vehicle interaction operational activities ▪ Statement that says - "Tell us what we need to hear not what you think we want to hear" ▪ An outline of the operational effectiveness baseline and validation steps ▪ Timing and logistics ▪ Roles and responsibilities	This activity is the responsibility of the project manager or lead facilitator working with site management. See sample Stage 1 note to senior managers and functional leads. Note: this information is separate and complementary to the Stage 2 validation workshop invitation.

Step 2: Use the operational effectiveness mapping template to prepare a site baseline.

Activity	Responsibility
Read the EMESRT Vehicle Interaction Improvement Guide (based on the work done by an EMESRT member company in 2015 and subsequently trialed and validated with the wider EMESRT membership). Review the work packages from Step 2: Establish an operational effectiveness baseline (Stage 1). Source the operational effectiveness mapping template appropriate to the activity and language that you will be working in. Set up the template using the site Vehicle Interaction Improvement project name. It is already populated with Operational Requirements, Erosion Factors and Operational Activities. Use this document to record all information directly and indirectly relevant for preparing the site operational effectiveness baseline.	This activity is the responsibility of the lead facilitator. EMESRT has prepared operational effectiveness mapping templates for vehicle interaction improvement. Key information from relevant guidance notes in the EMESRT Vehicle Interaction Improvement Guide are used in this process guide. Suggestion – set up extra tabs in your mapping spreadsheet to capture external requirements, incident analysis, key procedures, training packages, etc, before mapping them into the operational requirement tabs.

Step 3: Confirm current site operational effectiveness expectations.

Activity	Responsibility
Identify and list legislative and other external requirements that are relevant for site vehicle interaction operational requirements. Consider: ▪ General legislative requirements e.g. Duty of Care ▪ Specific mobile equipment legislative requirements e.g. use of proximity detection systems, brake testing for underground equipment, roll over protection, etc ▪ Any other external requirements that are relevant to prevention or mitigation operational activities, e.g., cabin integrity standards, etc ▪ Consider Acts, Regulations, Codes of Practice and Guidelines relevant to the operating jurisdiction Review leading practice sector resources that are relevant to site, e.g. ICMM and EMESRT Case Studies. Confirm and list your Company / Site Standards that are relevant to vehicle interaction operational activities, such as: ▪ Driving standards, related procedures and guidance notes ▪ Fatigue management leading practice expectations Identify and record any site-specific variations for the vehicle interaction operational activities, such as: ▪ Equipment specifications e.g. falling object protection system when loading from hoppers ▪ Interfaces with the public, train lines, etc ▪ Map the site variation details into relevant erosion factors, include new erosion factors if required	This activity is the responsibility of the lead facilitator. Talk to senior operational, engineering and maintenance personnel. Ask specific questions about vehicle interactions at the operation. Identify conditions and circumstances that are local e.g. interaction with trains, working around water, extreme weather conditions, public interfaces, etc.

Step 4: Carry out an incident analysis and confirm the erosion factor failures.

Activity	Responsibility
Option 2: Initial off-site mapping of current operational activity documents.	
Carry out a subject specific incident analysis by: ▪ Reviewing incident information from non-company sites operating in the same jurisdiction and region ▪ Reviewing 'Company' site incidents from similar operations ▪ Map the incidents against the EMESRT Vehicle Interaction Functional Performance Scenario Storyboards Review the erosion factors from the EMESRT Vehicle Interaction Incident Contributing Erosion Factors Assessment Tool to: ▪ Confirm that they are site relevant ▪ Analyse the site, region, and sector incident information to confirm that all incident types can be assigned to erosion factors ▪ As required, add new erosion factor failures ▪ Identify any erosion factor failures that are not site relevant	This activity is the responsibility of the lead facilitator. Consider company, regulator reports and other information. Use the EMESRT document erosion factors with detailed descriptions to review relevance for site. For example, some erosion factors from underground mining may not be relevant to smelter or refinery operating environment.

Analyse the site, region, and sector incident information to confirm that all incident types can be assigned to erosion factors.

Step 5: Prepare a version 1 baseline.

Activity	Responsibility
Option 1: Initial off-site mapping of current document vehicle interaction operational activities.	
Review the site baseline operational effectiveness validation mapping spreadsheet resource. View the EMESRT vehicle interaction baseline operational effectiveness validation learning module 2 and 5 video focusing on the operational activities management sheets. Source site documents that provide information about current site vehicle interaction operational activities, such as: ▪ Work operational activities documentation – procedures, Traffic Management Plans, Mobile Equipment Specifications, standards, work instructions, etc ▪ Records of operational activities, e.g. equipment pre-start and maintenance checks, shift communication logs, training assessments, equipment operation authorisation, etc Review each document to: ▪ Identify its purpose ▪ Confirm if it is relevant to the specific operational activity ▪ Using the site operational effectiveness baseline map, identify operational activities that correspond to the document ▪ Cut and paste relevant document extracts into the operational activities ▪ Provide specific references (section, step, or other location details) ▪ As required, make notes about the site documentation of current operational activities directly into the baseline operational effectiveness validation management sheets	This activity is the responsibility of the lead facilitator. This build option works well when the people preparing the operational effectiveness baseline are not based at the operating site. Working this way confirms that the facilitator is familiar with current site operational activities, and a partial baseline can be referenced during interviews with site personnel. It is important to have some site input in reviewing Version 1 of the operational effectiveness baseline, before the validation workshop. If mapping is incomplete and has not been reviewed by site personnel, there may be disagreements during the workshop about the accuracy of current mapping of operational activities. Remember, the strength of the validation workshop lies in group discussions that reveal variations between 'documented operational activities' and 'actual operational activities'. This helps identify gaps between what is formally recorded and what truly occurs on site, enabling more accurate alignment and continuous improvement.'.

Step 5: Prepare a version 1 baseline, *cont...*

Activity	Responsibility
Option 2: Initial off-site mapping of current operational activity documents.	
Review the site operational effectiveness baseline mapping resource, begin by viewing the EMESRT vehicle interaction baseline operational effectiveness validation learning module 2 and 3 video focusing on operational activities management sheets. Consider each spreadsheet tab and identify knowledgeable people who can assist mapping site processes against the operational activities organised by the following system operational requirement states.	This activity is the responsibility of the lead facilitator. This build option works well when the people preparing the Operational Effectiveness Baseline are from the operating site. Grouping the operational activities this way assists the mapping process because it aligns with organisational processes and accountabilities. Working this way confirms that accountable site personnel become fully engaged in the process and the version 1 Baseline is comprehensive. This confirms that the validation work can immediately compare *'documented operational activities' versus 'actual operational activities'* that occur on site.
PEOPLE - Operators and all people working around mobile equipment are trained, competent, authorised, informed, alert and situationally aware.	Knowledgeable people who can assist with the baseline mapping for this system operational requirement: ▪ Human resources ▪ Training ▪ Health and safety

Step 5: Prepare a version 1 baseline, *cont...*

Activity	Responsibility
Option 2: Initial off-site mapping of current operational activity documents, *cont...*	
EQUIPMENT - Mobile equipment is fit for use and key systems are functioning.	This activity is the responsibility of the lead facilitator. Engage with engineering, maintenance, and supply personnel. Look for information covering how mobile equipment is selected, commissioned, inspected, maintained, pre-use check lists, etc. This may include operations and maintenance manuals, new equipment specifications, etc. Knowledgeable people who can assist: ▪ Mobile equipment maintenance ▪ Engineering – re purchase of new equipment
ENVIRONMENT - The operating environment for mobile equipment is satisfactory, hazards are identified and managed.	Work with operations, training and health and safety personnel. Sources may include protocols for approaching mobile equipment, mine design, lighting requirements, traffic management, queuing, parking, use of barriers and demarcation, dust management, loading and dumping, changes in operating conditions, etc Knowledgeable people who can assist: ▪ Operations superintendents ▪ Technical services manager

Step 5: Prepare a version 1 baseline, *cont...*

Activity	Responsibility
Option 2: Initial off-site mapping of current operational activity documents, *cont...*	
Ask knowledgeable and experienced people to confirm that each operational activity is relevant. Ask the knowledgeable people to confirm how the site meets each relevant operational activity including details of: a. Where is this operational activity specified? *Document specific references from relevant: plans, work processes, training resources, procedures, guidelines, forms, assessments, policies, specifications, designs, etc* b. Has the operational activity been well implemented effectively? *Describe the implementation process: is it effective, consistently applied, reliable, and repeatable?* c. Is the status of the operational activity monitored as part of normal operations? *Describe how the status of this operational activity is assessed?* d. Cut and paste relevant document extracts into the operational activity e. Provide specific references (section details) As required, make notes about the site documentation of current operational activities directly into the operational effectiveness baseline.	This activity is the responsibility of the lead facilitator. Reviewing operational activity expectations assists in deciding the site relevance of each operational activity. The information included in the Specification, Implementation and Monitor columns is for guidance, it comes from an EMESRT member company and industry leading practice information. Preparing a baseline using the operational effectiveness analysis technique is a time consuming and demanding task. If you are under-prepared, then the validation workshop step will take longer and be less effective. Allow at least 4 weeks to complete this mapping work. As an example, the EMESRT Operational Effectiveness has these components: ▪ 13 Operational Requirements used for the phase 2 validation workshop ▪ 51 Erosion Factors ▪ 172 Operational Activities

Step 6: Review operational effectiveness mapping with knowledgeable site personnel.

Activity	Responsibility
After completing an initial review of site documents, schedule interviews with knowledgeable and experienced site personnel to review content based on the 13 vehicle interaction baseline operational effectiveness validation mapping spreadsheet tabs. At each interview, review mapping progress for each relevant operational activity: a. Review expectation and reconfirm that it is site relevant b. For each relevant operational activity, ask for their description of how the site meets the operational activity expectation c. Show them what current documented operational requirements have been identified and how they have been mapped (across specify, implement and monitor) d. Check to see if mapping is incomplete e. Correct and update as required Update the baseline by adding new information, notes and references etc.	This activity is the responsibility of the lead facilitator. It is useful and efficient to provide details of vehicle interaction operational effectiveness baseline mapping before any interviews. Extract the appropriate tab from the mapping sheet and provide it in PDF format so that interviewees can print and add their notes before the interview.

> Work with knowledgeable and experienced people who can assist with the operational effectiveness baseline mapping.

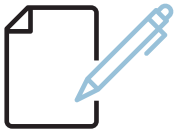
Step 7: Prepare validation workshop vehicle interaction operational effectiveness baseline management sheets.

Activity	Responsibility
The last step in Stage 1 is to prepare the operational effectiveness management sheets for the baseline validation workshop. These are prepared by converting the system operational requirements from the operational effectiveness mapping document into the 13 operational requirements listed below. Review each of the operational requirement states, tab by tab in the operational effectiveness management spreadsheet. 1 Vehicle operator/worker maintains adequate vehicle clearances. 2 Vehicle operator gives way to other vehicles. 3 Operators drive vehicles at speeds to meet the site rules and conditions. 4 Physical barrier in place to provide separation. 5 Vehicle operator parks to meet site rules. 6 Vehicle operator is not impaired and pays attention when driving to meet the site rules. 7 Alarm alerts the vehicle operator to a nearby hazard and the vehicle operator takes appropriate action. 8 Brake or steering warning system alarms and the vehicle operator responds appropriately. 9 Access gates/barriers prevent unauthorised vehicle entry. 10 Vehicle operator/worker loads vehicle to meet the site conditions and secures loose objects. 11 Vehicle operator and passengers use seatbelts/ restraints. 12 Airbags and cabin protection activate when required. 13 Worker activates emergency response and personnel respond.	This activity is the responsibility of the lead facilitator. Switching from system operational requirements to the operational activity used for the validation workshop is essential because: ▪ It focuses the work around operational requirements ▪ It assists participants to understand the many to many relationships and hierarchy between operational effectiveness components ▪ Version control of operational activities is maintained during the operational mapping build stage This step can be completed by copying the operational activity details into the operational effectiveness management sheet template. Print out each Operational Requirement on A0 sheets for the validation workshop.

Outputs from Stage 1 vehicle interaction baseline operational effectiveness preparation.

Activity	Responsibility
The outputs from Stage 1 baseline operational effectiveness preparation are: ▪ Version 1 of the site operational effectiveness baseline, prepared from the operational requirements management sheet template, that includes relevant site content identified with specific references, notes, assumptions, and questions to be resolved by workshop participants ▪ A list of all documents reviewed, noting those referenced in site baseline, and those that were not relevant ▪ A list of the knowledgeable and experienced personnel who have contributed to the baseline ▪ A register of relevant legislative requirements ▪ A review of site relevant incidents with cross references to erosion factors and the vehicle interaction functional performance scenario storyboards ▪ Validation workshop operational effectiveness management sheets organised around the operational requirement states	This activity is the responsibility of the lead facilitator. Cross reference Section 2. Manager and facilitator checklist.

Outputs from Stage 1 include a review of site relevant incidents with cross references to erosion factors.



NOTES



9. THE PROCESS: SECTION 3

STAGE 2 VALIDATION WORKSHOP

This section provides a step-by-step description of the process to facilitate a Stage 2 Baseline Operational Effectiveness Validation Mapping workshop.

TIMELINE OF ACTIVITIES

STEP 1



Invite participants.

STEP 2 - DAY 1



Session 1: Welcome, introductions and process training.



Session 2: Group work and feedback.

STEP 3 - DAY 2



Session 3: Continue group work and feedback.



Session 4: Progress feedback to senior managers.



Session 5: Workshop close.

> Confirm that line managers know about the workshop before issuing the invitation to participants.

Step 1: Workshop planning - selecting and inviting participants.

Activity	Responsibility
Workshop participants should be representative of the workforce who manage or are exposed to the unwanted exposures. The following roles should be represented: ▪ Mobile equipment operators ▪ Supervisors of mobile equipment operators ▪ Equipment maintainers ▪ Technical staff e.g. engineering ▪ Workforce representatives with health and safety skills ▪ Risk and safety team members ▪ Training personnel ▪ Senior managers / decision makers ▪ Others e.g. contractors with a relevant presence on the site Select participants who are influencers and natural leaders. Confirm that there are enough senior leaders to support each small working group. A successful workshop requires a minimum of 12 cross-sectional personnel, and the process can be used for groups of up to 40 people. Small group sizes work well between 4-6 personnel.	This activity is the responsibility of the lead facilitator. Confirm that the Stage 1 baseline preparation is on schedule for completion before committing to the validation workshop. Discuss the make-up of participants with site-based personnel. Consider role, expected contribution, and influence post workshop.
Send out invitations to those selected for the validation workshop. The invitation should confirm: ▪ Workshop intent to review and improve site vehicle interaction operational activities ▪ An outline of the operational effectiveness baseline and validation steps ▪ Confirm the invitation is based on expected contribution, knowledge, and experience ▪ Your contribution will be to review, correct and update the operational baseline analysis to reflect actual practices ▪ From this baseline review and update, plans will be prepared to improve the reliability and performance of vehicle interaction operational activities, including complementary technology considerations ▪ Participants are expected to provide information, advice, and guidance to the team ▪ Timings ▪ Location	

Step 1: Workshop planning - selecting and inviting participants, *cont...*

Activity	Responsibility
Confirm that the venue for the workshop is adequate with enough space for large group work (all participants) and break out areas for at least four small groups. Venue logistics: ▪ Allow for an area for the full participant group to work ▪ Small group work areas for group sizes of 4-6 workshop participants ▪ Small group work involves A0 printed operational effectiveness management sheets on walls, i.e. you must be able to hang the operational effectiveness management sheets so that they can be read and edited ▪ Reserve large group space before the workshop so that you have time to prepare the room ▪ Reserve a small group space for improvement planning on day 3	This activity is the responsibility of the project manager supported by the project sponsor. Large group work without desks or tables assists in establishing a purpose and forming the group. Consider using a circle of chairs for large group sessions. Consider theatre style seating at the front with round tables at the back for small group breakout areas. Use separate rooms for the small group breakout areas if there is not enough room for everyone.
Confirm venue resources and support: ▪ Flip charts ▪ White boards ▪ Wall space to hang operational effectiveness management sheets ▪ Projector and screen ▪ Large group work area – if possible, work without tables ▪ Small group areas for at least four groups ▪ Amenities ▪ Tea coffee ▪ Lunch Prepare the room: ▪ Hang posters ▪ Set up large group area – recommend circle of chairs set up	This activity is the responsibility of the lead facilitator.

Step 1: Workshop planning - selecting and inviting participants, *cont...*

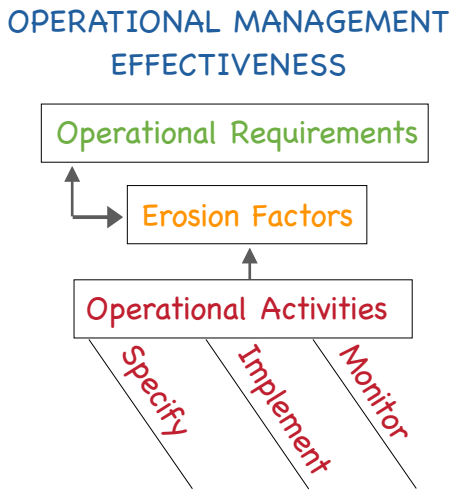
Activity	Responsibility
Team session information / resources. Arrange to have the following available: ▪ General arrangement plans - that give layout information on the roadways and vehicle interaction locations on the site ▪ Surface aerial photographs of relevant areas of the site ▪ Idea sharing devices (whiteboard, flip chart, post-it notes, etc,) in each room ▪ Confirm food, coffee and bathrooms ▪ Red felt marker pens, A0 printing of version 1 of baseline operational effectiveness management sheets	This activity is the responsibility of the lead facilitator. Print the vehicle interaction baseline operational effectiveness management sheets 1-2 days before the validation workshop.

Confirm that the venue for the workshop is adequate with enough space for large group work (all participants) and break out areas for at least four small groups.

Step 2: VI baseline operational effectiveness validation workshop.

Activity	Responsibility
Session 1: Opening, overview and introductions.	
Welcome participants: ▪ Ask them to sign in / tick their name off the pre-prepared list of participants ▪ Point out tea and coffee areas Commence the workshop welcome: ▪ Participant welcome by facilitator Opening: ▪ Workshop opening by senior manager (use invitation as a useful reference). Manager must state success of the process is premised on them "Telling us what we need to hear not what you think we want to hear". ▪ Introduction of facilitators (capture their years in the industry, for use later in the workshop)	This activity is the responsibility of the lead facilitator. Hang the starting set of A0 operational effectiveness management sheets before the workshop begins. Prepare your own facilitator run sheet and keep that at hand.
Overview: ▪ Provide an overview of 'Company' Vehicle Interaction Operational Effectiveness Improvement project. ▪ The intent of the workshop, i.e. validation of the VI Baseline Operational Effectiveness Validation before considering technology. ▪ Refer to the EMESRT VI 9-Layers of Defence model (see figure in Appendix) ▪ Provide an overview of the VI baseline operational effectiveness preparation work, e.g. reviewed 200+ documents and spoke to 20 people, it took 4 weeks to complete, etc. ▪ Advise that today's session is about workshop participants 'marking this homework'	This activity is the responsibility of the lead facilitator. Avoid using projectors for the validation elements of the workshop.

Step 2: VI baseline operational effectiveness validation workshop, *cont...*

Activity	Responsibility
Session 1: Opening, overview and introductions, *cont...*	
Participant Introductions: ▪ Write the below questions on the whiteboard, and ask each workshop participant to introduce themselves, model how you want it done covering: ◦ Their name ◦ Where they work and what they do ◦ Years in the industry (total these for all participants) ◦ Why effective vehicle interaction operational effectiveness is important to them ▪ Capture key points from each introduction Total up the participant years and say you are prepared to let them mark your homework and "Telling us what we need to hear not what you think we want to hear"	This activity is the responsibility of the lead facilitator. Capture key points from introductions.
Train workshop participants in the operational effectiveness management validation process: ▪ Explain the structure and elements of operational management effectiveness: ◦ Operational Requirements ◦ Erosion Factors ◦ Operational Activities ▪ Working from the butcher's paper use a simple example e.g. Operational Requirement 9: Access Gates and explain the concept	Flip chart explaining operational management effectiveness structure – consider drawing it in real time as per below. 

Step 2: VI baseline operational effectiveness validation workshop, *cont...*

Activity	Responsibility
Session 1: Opening, overview and introductions, *cont...*	
Large group review of an operational effectiveness management sheet: ▪ Ask the large group to stand up and work together to review one of the simpler management sheets, e.g., ◦ 5 - Vehicle operator parks to meet site rules ◦ 9 - Access gates/barriers prevent unauthorised vehicle entry ◦ 10 - Vehicle operator/worker loads vehicle to meet the site conditions and secures loose objects ▪ Confirm that they understand the intent of the ones chosen ▪ Check that the erosion factor modes are relevant, and if any are missing ▪ Work through the operational activities ◦ Ask if that is how things work around here? ◦ Make edits with red felt marker pens ▪ Beyond the edits, capture opportunities for improvement ▪ Use post-it notes for further details Confirm that participants understand the process.	This activity is the responsibility of the lead facilitator. Use post-it notes to capture opportunities for improvement. Encourage red felt marker pen mark-ups. Set up an issues parking lot as there will be many things raised by the participants that are not directly relevant to vehicle interaction but need to be captured and considered by the site management.
Preparing to move to Session 2: Decide on make-up of small groups based on information provided during introductions and advice from site management. ▪ Confirm groups have a mix of skills and are balanced ▪ Confirm that each participant knows what small group they will be working with End session 1 and go to a break.	Ask participants to return at a set time.

Step 2: VI baseline operational effectiveness validation workshop, *cont...*

Activity	Responsibility
Session 2: Small group work on the management sheets with regular large group feedback.	
When people return assign each small group a working area. ▪ Confirm that each participant knows where they are going ▪ For the first review round, assign small groups to appropriate management sheets, e.g., those groups with maintenance personnel to: ◦ 8: Brake or steering warning system alarms and the vehicle operator responds appropriately ▪ And small groups with operations and trainers to: ◦ 6: Vehicle operator is not impaired and pays attention when driving to meet the site rules ◦ 9: Access gates/barriers prevent unauthorised vehicle entry Get the groups working productively ASAP. Small group working on an operational effectiveness management sheet.	This activity is the responsibility of the facilitated small groups. Issue many red felt marker pens and post-it notes. Encourage everyone to contribute, confirm that people rotate through roles. Trust the process – people will step up, i.e. it does not need to be facilitator led but intervention guidance will be needed at times. Provide a set of reference materials to each small group: ▪ Details of all operational activities ▪ Erosion factor details Observe the small group work, support people to understand and apply the approach. The quality of discussions and content generated will confirm the level of understanding.

> Assign small groups to appropriate operational effectiveness management sheets, does not need to be facilitator led but needs a relevant senior manager involved - trust the process.

Step 2: VI baseline operational effectiveness validation workshop, *cont...*

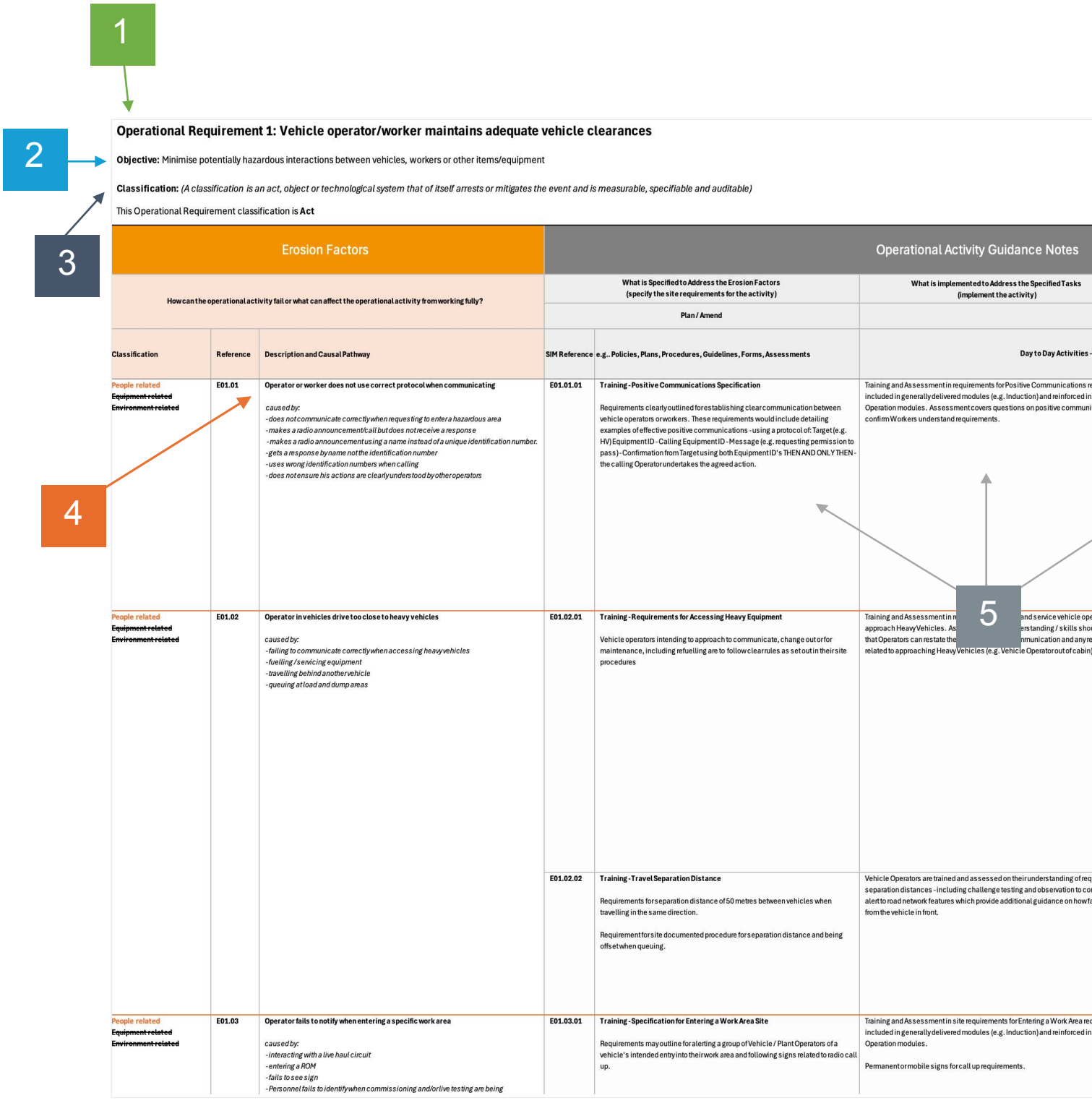
Activity	Responsibility
Session 2: Small group work on the management sheets with regular large group feedback.	
Small group feedback: ▪ As each group completes their first review, pause the other groups at a convenient time for a summary of the validation work: ◦ Ask them to summaries the operational requirement and confirm the erosion factors ◦ Ask for any significant edits or opportunities for improvement identified for operational activities ◦ Encourage further opportunities for improvement Schedule working groups have breaks for lunch but allow them to work at their own pace. Small group progress feedback is essential for: ▪ Monitoring progress ▪ Collating useful content ▪ Developing trust between small groups ▪ An operational activity requires just one detailed review ▪ To confirm that the context has been considered for repeated operational activities (gray shaded) by reviewing the linked erosion factor and operational requirement ▪ Additional operational activity details added to gray shaded repeated operational activity should be explained during large group feedback	This activity is the responsibility of the facilitated small groups. Small group feedback will accelerate during the validation workshop. Encourage people providing the feedback to concentrate on the non-shaded operational activities, i.e. those that are new and not previously reviewed. Monitor small group progress and plan for the next management sheets. It is useful to begin updating the operational effectiveness baseline during the workshop. This enables facilitators to ask questions and confirm that they obtain the information that they need. Take photos of completed sheets. Once sheets are reviewed and considered completed by the group, consider having a support person to document progress directly to the vehicle interaction baseline operational effectiveness management sheets on shared drives.

Step 2: VI baseline operational effectiveness validation workshop, *cont...*

Activity	Responsibility
Session 2: Small group work on the management sheets with regular large group feedback, *cont...*	
The VI Baseline Operational Effectiveness Validation workshop follows this iterative process: 1. Review the operational requirements and confirm that it is relevant to effective and productive mobile equipment operations for the site 2. Review each erosion factor and confirm that the operational scenarios apply, and it can compromise the operational requirement being reviewed 3. Then review each linked operational activity to confirm that it can prevent or mitigate the erosion factor from compromising the operational requirement 4. Based on operational practice review and update details on how the operational activity is: a. Specified b. Implemented c. Monitored	This activity is the responsibility of the lead facilitator. This format and work cycle provides participants with a whole system overview and an operational context as they review each operational activity in detail. Site experience has shown that all operational requirements are usually relevant. Some erosion factor causes depend on site operations but remember erosion factor relevance was considered during baseline mapping. When updating operational activities based on what actually occurs on site, ask the small groups to identify gaps and provide details of 'opportunities for improvement'. Ask for operational examples that explain the gaps.

BASELINE VALIDATION MANAGEMENT SHEET ELEMENTS

Note: For 6, 7 and 8, the text in black was captured during the initial desktop comparison process and the text in red was captured during the validation workshop and will assist in identifying gaps in operational activities.



Operational Requirement 1: Vehicle operator/worker maintains adequate vehicle clearances

Objective: Minimise potentially hazardous interactions between vehicles, workers or other items/equipment

Classification: *(A classification is an act, object or technological system that of itself arrests or mitigates the event and is measurable, specifiable and auditable)*

This Operational Requirement classification is **Act**

Erosion Factors			Operational Activity Guidance Notes		
How can the operational activity fail or what can affect the operational activity from working fully?			What is Specified to Address the Erosion Factors (specify the site requirements for the activity)		What is implemented to Address the Specified Tasks (implement the activity)
			Plan / Amend		
Classification	Reference	Description and Causal Pathway	SIM Reference	e.g., Policies, Plans, Procedures, Guidelines, Forms, Assessments	Day to Day Activities -
People related ~~Equipment related~~ ~~Environment related~~	E01.01	Operator or worker does not use correct protocol when communicating *caused by:* *-does not communicate correctly when requesting to enter a hazardous area* *-makes a radio announcement/call but does not receive a response* *-makes a radio announcement using a name instead of a unique identification number.* *-gets a response by name not the identification number* *-uses wrong identification numbers when calling* *-does not ensure his actions are clearly understood by other operators*	E01.01.01	Training - Positive Communications Specification Requirements clearly outlined for establishing clear communication between vehicle operators or workers. These requirements would include detailing examples of effective positive communications - using a protocol of: Target (e.g. HV) Equipment ID - Calling Equipment ID - Message (e.g. requesting permission to pass) - Confirmation from Target using both Equipment ID's THEN AND ONLY THEN - the calling Operator undertakes the agreed action.	Training and Assessment in requirements for Positive Communications re included in generally delivered modules (e.g. Induction) and reinforced in Operation modules. Assessment covers questions on positive communi confirm Workers understand requirements.
People related ~~Equipment related~~ ~~Environment related~~	E01.02	Operator in vehicles drive too close to heavy vehicles *caused by:* *-failing to communicate correctly when accessing heavy vehicles* *-fuelling / servicing equipment* *-travelling behind another vehicle* *-queuing at load and dump areas*	E01.02.01	Training - Requirements for Accessing Heavy Equipment Vehicle operators intending to approach to communicate, change out or for maintenance, including refuelling are to follow clear rules as set out in their site procedures	Training and Assessment in r and service vehicle ope approach Heavy Vehicles. As erstanding / skills sho that Operators can restate the munication and any re related to approaching Heavy Vehicles (e.g. Vehicle Operator out of cabin
			E01.02.02	Training - Travel Separation Distance Requirements for separation distance of 50 metres between vehicles when travelling in the same direction. Requirement for site documented procedure for separation distance and being offset when queuing.	Vehicle Operators are trained and assessed on their understanding of req separation distances - including challenge testing and observation to co alert to road network features which provide additional guidance on how fa from the vehicle in front.
People related ~~Equipment related~~ ~~Environment related~~	E01.03	Operator fails to notify when entering a specific work area *caused by:* *-interacting with a live haul circuit* *-entering a ROM* *-fails to see sign* *-Personnel fails to identify when commissioning and/or live testing are being*	E01.03.01	Training - Specification for Entering a Work Area Site Requirements may outline for alerting a group of Vehicle / Plant Operators of a vehicle's intended entry into their work area and following signs related to radio call up.	Training and Assessment in site requirements for Entering a Work Area rec included in generally delivered modules (e.g. Induction) and reinforced in Operation modules. Permanent or mobile signs for call up requirements.

Element legend:

1. Operational requirements set out the performance expectations in the mine management system safe and effective site operations, and is:
   - Specifiable
   - Measurable, and
   - Auditable
2. Operational requirement objective
3. Operational requirement classification - is it an Act, an Object or a Technological System
4. Erosion factors, including description and causal pathways
5. Operational activity guidance notes
6. Operational activities - Specify
7. Operational activities - Implement
8. Operational activities - Monitor

		Validate Operational Activity		
	Monitoring and Enforcement of the Specified Tasks (monitor the activity)	Is the Operational Activity at the site effective and executed consistently		
Do / Check		Planned task observations; Manager / Superintendent inspections		
Completion of Forms, Assessments, Inspections		Operational Activity verification task	By Who - Owner? (Verification is performed by others not directly involved in the Operational Activity process)	How Often?
equirements Vehicle cations to	Electronic training system which confirms currency of skills including ability to undertake positive communications. Specified review period to retain competencies are stated and tracked. Supervisors monitor radio call up behaviours of their Vehicle Operators and mentor / reinforce positive communications as required.	Training - Positive Communications Specification Requirements clearly outlined for establishing clear communication between vehicle operators or workers. These requirements would include detailing examples of effective positive communications - using a protocol of: Target (e.g. HV) Equipment ID - Calling Equipment ID - Message (e.g. requesting permission to pass) - Confirmation from Target using both Equipment ID's THEN AND ONLY THEN - the calling Operator undertakes the agreed action. Training 7.1 Induction and Familiarisation Training	Training and Assessment in requirements for Positive Communications requirements included in generally delivered modules (e.g. Induction) and reinforced in Vehicle Operation modules. Assessment covers questions on positive communications to confirm Workers understand requirements.	Electronic training system which confirms currency of skills including ability to undertake positive communications. Specified review period to retain competencies are stated and tracked Competency assessment Record - Generic Haul/ dump truck - RIIMPO311A pages 28 Distance Between Vehicles - The appropriate distance to be maintained between vehicles traveling in single file, as stated in the relevant Xstrata Transport Rules and as visibility and roadway conditions dictate page 51 Monitor & Anticipate Traffic Conditions - Maintain a safe distance (50m) between truck, other
erators to uld confirm strictions	Electronic training system which confirms currency of skills including Vehicle Operator's understanding of approach Heavy Vehicles. Specified review period to retain competencies are stated and tracked. Supervisors monitor how light and service vehicles access Heavy Vehicles and mentor / reinforce requirements.			
uired nfirm they are r they are	Electronic training system which confirms currency of skills including Vehicle Operator's understanding of vehicle separation distances. Specified review period to retain competencies are stated and tracked. Supervisors monitor how Vehicles Operators are operating to maintain required travel separation distances on the site road network.	**Training - Travel Separation Distance** Requirements for separation distance of 50 metres between vehicles when travelling in the same direction. Requirement for site documented procedure for separation distance and being offset when queuing.	Vehicle Operators are trained and assessed on their understanding of required separation distances - including challenge testing and observation to confirm they are alert to road network features which provide additional guidance on how far they are from the vehicle in front. Competency Assessment Record Generic Haul / Dump Truck Assessment - - Explains 30 / 50 rule for approach by a light vehicle and by an approach by a service and maintenance vehicle Theory	Electronic training system which confirms currency of skills including Vehicle Operator's understanding of vehicle separation distances. Specified review period to retain competencies are stated and tracked Competency Assessment Record Generic Haul / Dump Truck Assessment - - Explains 30 / 50 rule for approach by a light vehicle and by an approach by a service and maintenance vehicle Theory
uirements Vehicle	Electronic training system which confirms currency of skills including ability to undertake positive communications for Entering Work Areas. Specified review period to retain competencies are stated and tracked. Supervisors monitor radio call up behaviours of their Vehicle Operators and mentor / reinforce positive communications as required.	Workers conduct a JSA or Task Hazard Analysis to identified required activities to control any hazards. Workers place site required demarcation around commissioning locations (outside the potential movement range of the equipment) and implement other controls identified during JSA / included in commissioning protocol.	Assessment of the understanding / skills should confirm that Operators can restate the requirements for communication and any restrictions related to approaching Heavy Vehicles (e.g. Vehicle Operator out of cabin). Competency Assessment Record Generic Haul / Dump Truck Assessment - - Explains 30 / 50 rule for approach by a light vehicle and by an approach by a service and maintenance vehicle	Requirements for separation distance of 50 metres between vehicles when travelling in the same direction. Requirement for site documented procedure for separation distance and being offset when queuing.

Step 2: VI baseline operational effectiveness validation workshop, *cont...*

Activity	Responsibility
Session 2: Close - end of day 1	
Workshop close - reform as a large group and: ▪ Ask for feedback from each person on the process. Ask "Are we hearing what we need to hear?" ▪ Confirm that participants are satisfied with the outcomes ▪ Outline day 2 work ▪ Complete a check out by asking each participant to describe the standout finding from their validation work on day 1 ▪ When check out is completed, thank participants for their contribution ▪ Confirm the day 2 start time Ask a senior manager to close the workshop.	This activity is the responsibility of the facilitator. *Consider using a circle of chairs for large group sessions.*

Activity	Responsibility
Session 3: Day 2 welcome and check in.	
Welcome participants: ▪ Ask participants to sign-in Recommence the workshop in large group space: ▪ Day 2 welcome back by facilitator ▪ Ask for any overnight reflections on the process and opportunities to improve vehicle interaction operational activities ▪ Describe the schedule for day 2 including the timing for feedback to senior managers ▪ Ask "Are we hearing what we need to hear?" Identify 3-4 people to prepare and deliver workshop feedback to senior managers.	This activity is the responsibility of the facilitator. *Ask each participant to speak in turn during the check in.* *Allow 30 – 40 minutes.* *Capture improvement opportunities.* *The 3-4 people nominated to prepare and deliver the workshop feedback are expected to participate in Day 3 planning work.*

Step 2: VI baseline operational effectiveness validation workshop, *cont...*

ACTIVITY	Responsibility
Session 3: Continue small group work on the baseline validation with large group feedback.	
Continue with the vehicle interaction baseline operational effectiveness validation workshop iterative process: 1. Review the operational requirements and confirm that it is relevant to effective mobile equipment operations for the site 2. Review each erosion factor and confirm that the operational scenarios apply, and it can compromise the operational requirement being reviewed 3. Then review each linked operational activity to confirm that it can prevent or mitigate the erosion factors from compromising the operational requirement 4. Based on operational practice review and update details on how the operational activity is: a. Specified b. Implemented and c. Monitored	This activity is the responsibility of the facilitator. *This format and work cycle provides participants with a whole system overview and an operational context as they review each operational activity in detail.* *Site experience has shown that all operational requirements are relevant.* *Some erosion factor causes depend on site operations but remember erosion factors relevance was considered during baseline mapping.* *When updating operational activities based on operational practice ask the small groups to identify gaps and provide details of 'opportunities for improvement'.* *Ask for operational examples that explain the gaps.*

> This format and work cycle provides participants with a whole system overview and an operational context as they review each operational activity in detail.

Step 2: VI baseline operational effectiveness validation workshop, *cont...*

Activity	Responsibility
Session 3: Continue small group work on the baseline validation with large group feedback.	
Capture and update information from the small group work throughout the workshop. Review mark ups, post-it notes comments and opportunities for improvement. Ask for operational examples that illustrate *'opportunities for improvement'*, include these in the updated VI Baseline. If you use the management sheets, set where repeated operational activities are shaded, i.e. they only appear in full once, it is important to also capture any notes shaded operational activities.	This activity is the responsibility of the lead facilitator and co-facilitator. *Capture information as groups are working. Take photographs of every sheet for reference.* *If the notes are unclear, ask questions directly to the small groups, especially around opportunities for improvement.* *Consider having a support person to document progress directly to the vehicle interaction baseline operational effectiveness management sheets on shared drives.*

Activity	Responsibility
Session 3: Continue small group work.	
When groups complete their reviews of a set of management sheets by operational requirements, allocate them a new set of management sheets. As Session 3 continues, consider asking more than one small group to review separate sheets from the same operational requirement, e.g. for Vehicle operator/worker maintains adequate vehicle clearances.	This activity is the responsibility of the facilitator. *Where there are multiple operational effectiveness management sheets for larger operational requirements - on day 2 consider assigning these to more than one group.*

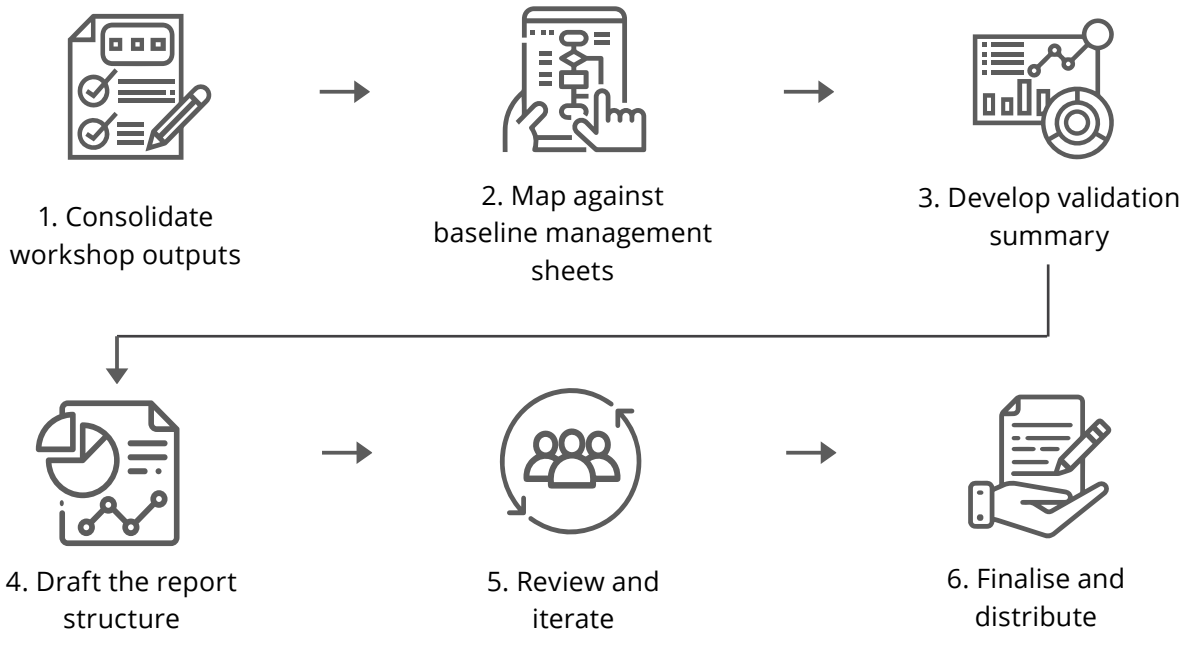
Step 2: VI baseline operational effectiveness validation workshop, *cont...*

Activity	Responsibility
Session 4: Progress feedback to senior managers.	
Monitor the progress on the review of management sheets for Session 3 to make sure that all are reviewed. Reform the large group at least 90 minutes before the schedule feedback to senior managers. ▪ Ask the 3-4 people nominated to begin preparing workshop feedback to senior managers ▪ Reallocate small group members if necessary ▪ Run the feedback preparation and the completion of management sheets concurrently Assist the feedback group to prepare and deliver a summary presentation for senior managers covering: ▪ An overview of the validation workshop process ▪ Headline findings (opportunities for improvement) ▪ Highlight work required to restore current design and operate VI operational activities to expected operational effectiveness ▪ Outline next steps – day 3 planning and a workshop report on findings that includes an updated vehicle interaction operational baseline ▪ Capture response from senior managers.	This activity is the responsibility of the selected workshop participants. *It is efficient to organise both:* ▪ *Findings (opportunities for improvement)* ▪ *Key elements for restoring current VI operational activities to expected operational effectiveness into the three operational requirements used in the mapping template:* 1. *People* 2. *Equipment* 3. *Environment* *See reporting template.*
Activity	**Responsibility**
Session 5: VI baseline operational effectiveness workshop close.	
Workshop Close – working as large group: ▪ Summaries the next steps for improvement planning ▪ Confirm that participants are satisfied with the outcomes ▪ Complete a check out by asking each participant to describe the most important opportunities for improvement from the baseline review work ▪ Ask for senior manager for final comments last in the check out ▪ When check out is completed, thank participants for "telling us what we needed to hear" and close the workshop	This activity is the responsibility of the facilitator. ▪ *Write the next steps down on butcher's paper or a whiteboard* ▪ *Confirm that each opportunity for improvement identified by workshop participants has been collated for review* ▪ *Capture the five most important opportunities identified by participants*



10. REPORT PREPARATION

During the second day of the workshop, before the feedback to senior managers confirm who can be available to review the validation workshop outputs, update the baseline, and assist with identifying and developing key themes for the report.





WORKSHOP VALIDATION OUTPUT REPORT DEVELOPMENT

1. Consolidate workshop outputs
- Gather all materials: Flip charts, digital notes, photos, recordings, and participant feedback
- Organise key themes: Identify critical insights, challenges, and opportunities discussed
- Validate data: Confirm accuracy and completeness of workshop outputs

2. Map against the EMESRT 13 operational requirement management sheets
- Align findings with the operational requirements
- Identify gaps in current operational practices to achieve the required level of effectiveness
- Highlight strengths and areas of maturity across the operational requirements

3. Develop validation summary
- Summarise baseline validation results: What was validated, what wasn't, and why
- Validation outcomes will fall into the following categories
  - What is specified, implemented and monitored is effective
  - What is specified is inadequate and needs improvement to be effective
  - What is specified is adequate, but its implementation is not effective
  - What is specified and implemented is adequate but is not monitored adequately to identify drift from effective performance
- Include workshop participant perspectives: Capture consensus and divergent views
- Document assumptions and limitations of the validation process

4. Draft the report structure
- Executive summary
- Workshop overview
- Methodology
- Findings and analysis
- Validation outcomes
- Opportunities for improvement grouped into people, equipment and environment
- Appendices (e.g., raw data, workshop materials)

5. Review and iterate
- Internal review by facilitators and technical leads
- Stakeholder feedback loop: Share draft with key participants for input
- Revise and refine based on feedback

6. Finalise and distribute
- Format professionally for readability and clarity
- Distribute to stakeholders: Site teams, corporate HSE, etc
- Archive for future benchmarking

The new baseline remains dynamic for future updating as gaps are closed and validation of new activities and technology are introduced.



11. KEY MESSAGES TO FACILITATORS

- Do not underestimate the time and resources required to complete the baseline preparation step.
- Extensive work is required to review and map the baseline information into the mapping template.
- Inadequate preparation will result in suboptimal validation workshop outcomes.
- Preparation of the baseline is key to delivering a successful baseline workshop.
- A minimum four-week lead time is required to prepare the baseline, coordinate and prepare for the Stage 2 validation workshop.
- Select workshop participants who are influencers and natural leaders.
- Source 3-5 years of site vehicle interaction incident records, review incident information from non-company sites operating in the same jurisdiction and region.
- Work with knowledgeable and experienced people who can assist with the baseline mapping.
- Consider having a support person to document progress directly to the vehicle interaction baseline operational effectiveness management sheets on shared drives.
- Confirm line managers know about the workshop before issuing the invitation.
- Avoid using projectors for the validation work on the management sheets.
- Consider drawing the Operational Effectiveness structure in real time on a flip chart.
- Assign small groups to appropriate Operational Requirement management sheets, this does not need to be facilitator led, trust the process.
- Confirm the working groups have breaks for lunch but allow them to work at their own pace.
- Confirm that each opportunity for improvement identified by workshop participants has been collected.
- Write the next steps down on butcher's paper or a whiteboard.
- Stage 2 report audience is senior leaders.
- Set up an issues parking lot as there will be many things raised by the participants that are not directly relevant to vehicle interaction but need to be captured and considered by the site management.



12. PREPARATION CHECKLIST

DOCUMENTATION SOURCES

- [ ] Procedure
- [ ] Task instructions
- [ ] Operational records
- [ ] Training information - process and records
- [ ] Incident experience
- [ ] Standards
- [ ] Legislative requirements
- [ ] Company requirements

BEFORE WORKSHOP ACTIVITIES

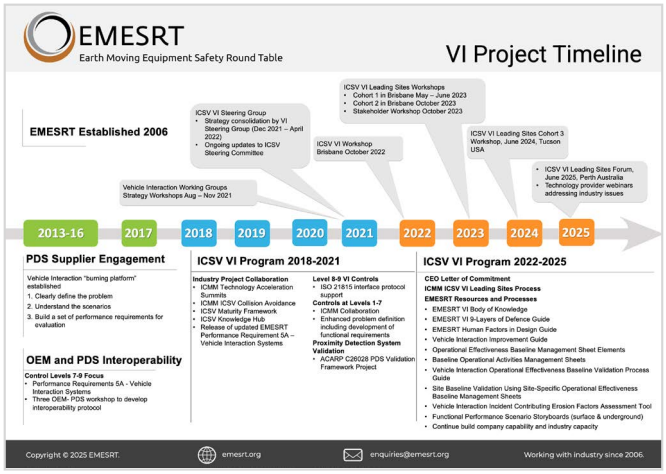
- [ ] Mapping documentation into the template completed
- [ ] Progress reviewed with knowledgeable site personnel
- [ ] Announced Phase 1
- [ ] Selected and invited participants
- [ ] Reviewed site operations
- [ ] Discussed VI Operational baseline map with knowledgeable personnel, amended and updated as required
- [ ] Converted VI mapping format to validation workshop format
- [ ] Prepared spreadsheet for each operational required operating state for:
  - Printing as validation workshop management sheets
  - A shared resource for small group review work
- [ ] Printed validation workshop poster and management sheets in A0 size
- [ ] Printed reference material covering erosion factors and operational activity details

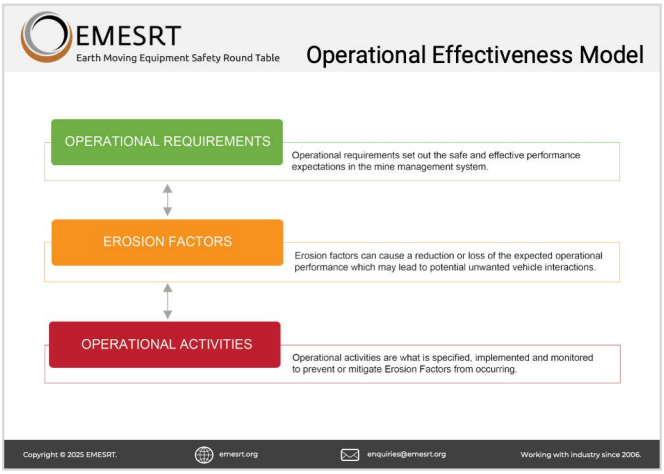
VENUE

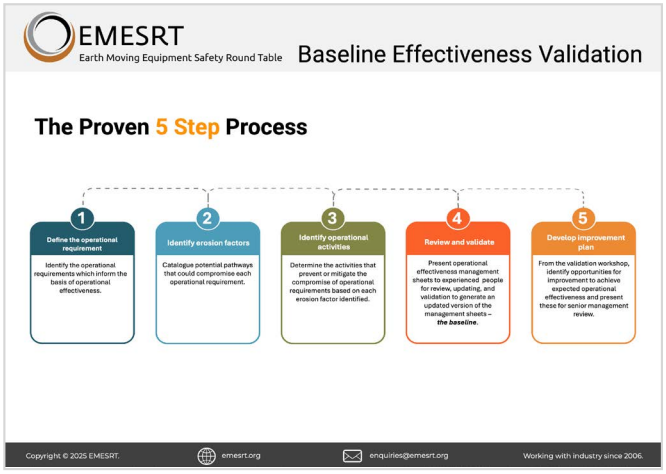
- [ ] Confirmed venue is adequate with space for large group and break out areas for at least four small groups
- [ ] Flip chart
- [ ] White boards
- [ ] Wall space to hang Operational sheets
- [ ] Projector and screen
- [ ] Large group work area – if possible – work without tables
- [ ] Small group areas for at least four groups
- [ ] Access to amenities
- [ ] Water
- [ ] Tea and coffee
- [ ] Lunch

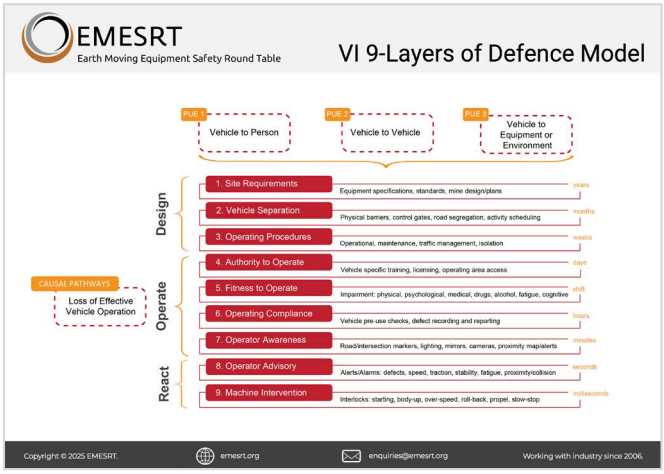
13. WORKSHOP POSTERS

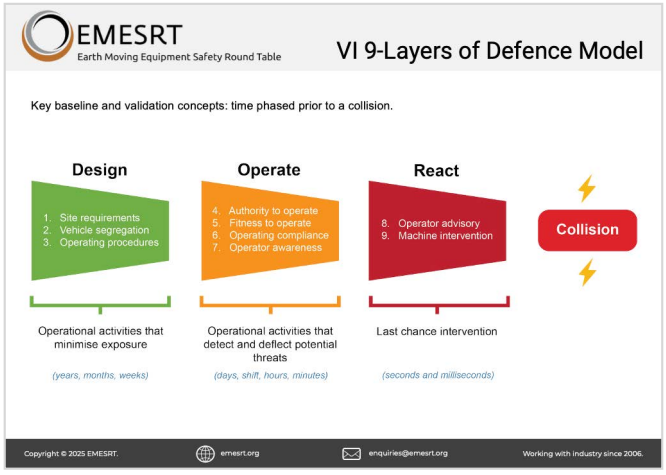
Consider printing the six workshop posters below on A0 size (841 mm x 1189 mm, 84.1 cm x 118.9 cm or 33.1 inches x 46.8 inches) light weight cardboard and displaying them on the wall prior to the workshop start. The posters can be downloaded from the EMESRT website Vehicle Interaction Body of Knowledge page.

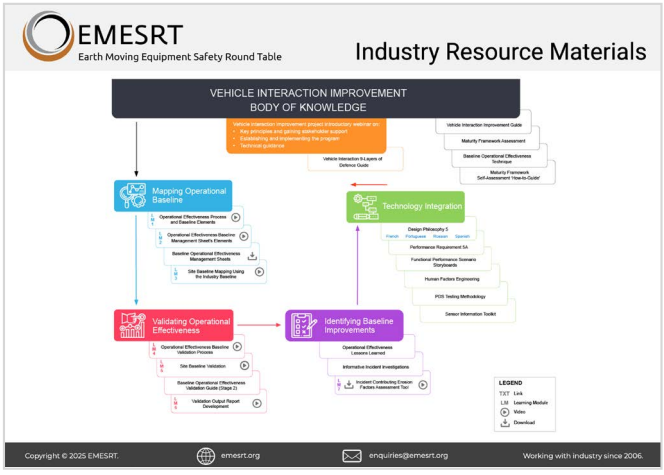












EMESRT

EMESRT is a global ‘safety by design’ initiative established by mining companies to identify and close the functional performance expectations gap between earth moving equipment users and equipment designers.

CONTACT EMESRT

enquiries@emesrt.org

emesrt.org

Follow EMESRT on LinkedIn