



PRISM Course Outline

Module		Learning Outcomes
1	Introduction to investigation	To define the value of investigation for various company, industry and regulator stakeholders.
2	Principles of PRISM	To appreciate that sustainable change only occurs after detailed insight.
3	A Structured Investigation Process	To understand that investigation stages and steps are scalable depending on the incident.
4	PRISM Tools & Technology	To realise that investigation is highly systematic and based on a proven technology.
5	Evidence Collection	To appreciate that findings ultimately stem from sound evidence.
6	Essential Tools	To define the 'standard' tools that are routinely applied in an analytic process to develop 'findings'.
7	Discretionary Tools	To appreciate the other tools that are used on an 'as needed' basis when additional analysis is needed.
8	Managing the Investigation Process	To understand that investigation teams need managing for outcomes just like any project.
9	Managing the Investigation Outcomes	To understand that investigation outcomes need communicating and implementing.
A	Appendices	To provide case studies, syndicate tasks and worked examples for participant exercises.
B	Bibliography	To provide relevant reference material and guidance sources for participants.

See overleaf for details of each module...

MODULE 1: Introduction to Investigation

Goal

- To achieve competency in describing and promoting the value of investigation.
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Aims / Objectives:

- Appreciate what incidents mean to different stakeholders.
 - Appreciate the purpose of an incident investigation.
 - Appreciate the scalability of investigations.
 - Understand the history of incident investigation (including the early technology, industry involvement such as mining and aviation, and regulator influences).
 - Appreciate the reach of incident investigation (eg. fraud, political judgements and public and occupational safety).
 - Cost-benefit of investigation process (eg. training, company, team, prevailing culture).
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Key Elements

- Housekeeping & course logistics.
 - Overview of the course method: syndicate exercises for assuring competency.
 - Key cultures: avoidance vs. continual improvement.
 - What gets investigated? To what degree?
 - Who uses the outcomes of investigations – and how has this evolved over the last few decades?
 - The tangible benefits of learning from failure.
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Methods

- Present and discuss presentation material for module 1.
 - Definitions of key aspects of investigations (mishaps, incidents, accidents).
 - Participant examples from their industries.
 - Group development of a timeline of investigation development.
 - Syndicate exercise: 'Cost benefit chart'.
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MODULE 2: Principles of PRISM

Goal

- To achieve competency in communicating the principles of PRISM.
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Aims / Objectives

- Understand that any failure can be used as a window on the management system.
 - Understand the advantages of a 'no fault - no blame' approach.
 - Understand the correct role of 'fault – blame' if required in some investigation outcomes.
 - Understand the requirement for a multi-disciplinary approach to investigation.
 - Failures occur in at a point in time/place, but are created at a different time/place.
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Key Elements

- Works systems and risk – basic risk levels and risk 'treatment'.
 - Corporate judgements of acceptable risk.
 - Agreement on improvement.
 - Systems issues are most fruitful.
 - Behavioural Safety – the links between 'Individual Behaviour' and 'Organisation Behaviour'.
 - Why managers' and executives' behaviours are also valid issues for Behaviour Safety (in addition to operators' behaviours).
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Methods

- Present and discuss presentation material for module 2.
 - Organisational models of failure.
 - Discussion on 'fault' and 'blame'.
 - Root causes or contribution discussion.
 - Failure 'types' and failure 'tokens'.
 - Syndicate exercise – Whose behaviour anyway?
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MODULE 3: A Structured Investigation Process

Goal

- To achieve competency in communicating the structure of investigation processes.
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Aims / Objectives

- Understand options available in the investigation process.
 - Appreciate that investigation is a process with steps and stages.
 - Appreciate the need for an iterative process.
 - Appreciate the need for a managed process that provides scalability and flexibility in the choice of tools and techniques.
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Key Elements

- Define the 'generic' process for investigation.
 - Describe common traps and pitfalls in different process approaches.
 - Demonstrate conceptually the process for small, medium and large investigations.
 - Show that choice is available during the process.
 - Illustrate 'iteration' with a late-discovered piece of evidence that changes the interpretation of previous evidence.
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Methods

- Present and discuss presentation material for module 3.
 - Step through participants' examples for small, medium and large incidents.
 - Demonstrate iteration with an example. Discuss how (for example) operator lifestyle evidence may influence an investigation team's judgement and interpretation.
 - Discuss the validity of 'early interpretation' given that evidence is constantly building.
 - Syndicate exercise "How to scale an investigation".
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MODULE 4: PRISM Tools & Technology

Goal

- To achieve competency in identifying the tools and technologies adopted by PRISM.
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Aims / Objectives

- Understand the range and types of tools available in PRISM.
 - Appreciate the relative strengths and weaknesses of different tools, and which tools complete other tools.
 - Understand the uses for PRISM tools and techniques.
 - Understand when to best deploy tools and techniques during an investigation.
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Key Elements

- Outline each tool, and the way it is applied.
 - Different applications for different investigations (e.g. multiple fatality versus product flaws).
 - Discuss when to start a technique, and the need to continually update it with new evidence.
 - Appreciate that tools are an aid and should not 'highjack' clear thinking.
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Methods

- Present and discuss presentation material for module 4.
 - Demonstrate the application of tools with current topical examples.
 - Illustrate the use of standards for e.g. equipment limits (such as transport signals or high pressure hydraulics).
 - Syndicate exercise: "Recording an event".
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MODULE 5: Evidence

Goal

- To achieve competency in managing the full life-cycle of evidence.
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Aims / Objectives

- Develop skills in observation, interviewing and measurement techniques
 - Develop skills in screening information to identify relevant evidence.
 - Develop approaches to 'sense-making' of data and information.
 - Distinguish fact from opinion, and appreciate the limited and restricted role of hearsay.
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Key Elements

- The sequence of incidents > data > information > evidence > knowledge.
 - What is fact versus opinion? Is there a sliding scale to 'facts' or are they absolute?
 - Corroboration (supporting facts) and 'triangulation' (independent verification).
 - Checking, measurement and recording.
 - Bias: the human factors of memory, recall and recollection.
 - Recording logistics: note-taking, recorded images & audio, data logging.
 - Tampering, cover-ups and other impediments to access and accuracy.
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Methods

- Present and discuss presentation material for module 5.
 - Discussion of fact vs. non-fact; use of topical examples in the political arena.
 - Media examples of recall bias.
 - The use of standards in directing searches and enquiries.
 - Examination of work records and reports, including equipment performance and the up-keep of maintenance regimes.
 - Syndicate exercise: "Recording an event that happened today".
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MODULE 6: Essential Tools

Goal

- To achieve competency in selecting and applying essential investigation tools.
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Aims / Objectives

- Identify PRISM essential tools, and the purpose and application for these essential tools.
 - Develop skills using Events and Conditions flowcharting, and appreciate the scalable nature of the tool.
 - Develop an understanding of Human Factors, and the role of human error at various times and places within an organisation.
 - Develop skills in 'Rich Picture' development.
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Key Elements

- Describe incident Events and Conditions and understand the relationship between the two.
 - Understand the need to make decisions about scalability.
 - Human Factors –the hierarchy of causes, capability and limitations, human error (Generic Error Modelling System) and other Reason models. Describe the 'Swiss-cheese' model as a useful summary of these concepts.
 - PRISM error tool: A logical combination of GEMS and the organisation sequence diagram to allow classification of error-management opportunities.
 - Rich Picture development: building a 'system of systems'.
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Methods

- Present and discuss presentation material for module 6.
 - Discuss each tool and its 'state of the art' application.
 - Illustrative error finding using topical events. Discuss common high profile accidents (such as the Paris car crash of 1997) and discuss the locus of error.
 - Video – Chunnel fire.
 - Syndicate exercise: "Construct a rich picture for the Chunnel Fire".
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MODULE 7: Discretionary Tools

Goal

- To achieve competency in applying discretionary tools, and the basis for selection.

Aims / Objectives

- Develop understanding of when to apply different types of discretionary tools.
- The logic in selecting and using different tools that may over-lap.
- Handling new findings later in an investigation.
- Resolving conflicting findings from different tools – integration of findings into a coherent picture.

Key Elements

- Describe the logic and approach for:
 - Fault Tree Analysis.
 - Barrier Analysis (for both energy flows and ‘information / decision’ flows).
 - Change Analysis.
 - Codes, Standards and Regulations.
 - The Decision Action Response Technique (DART).

Methods

- Present and discuss presentation material for module 7.
- Discuss each tool and its ‘state of the art’ application.
- Illustrate tool findings using topical events, such as a simple tree structure for the preceding factors involved in a marine accident such as the Herald of Free Enterprise.
- Video – Challenger (emphasising the role of management decisions and commercial constraints on tiered sub-contractors).
- Syndicate exercise: “Construct a Fault Tree for Challenger” (basic three level summary tree).

MODULE 8: Managing the Investigation Process

Goal

- To achieve competency in managing an investigation team and its process.
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Aims / Objectives

- Understand the need to specify scope and mandate for an investigation.
 - Understand team structures and roles and responsibilities.
 - Understand requirements for tracking and processing evidence.
 - Understand the interactions required with various stakeholders during and after an investigation.
 - Appreciate requirements for tact and sensitivity.
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Key Elements

- Team composition and leadership.
 - Resources required.
 - Project Management skills required.
 - Contingency planning.
 - Human Resources input to interviews.
 - Legal issues of discovery.
 - Logistics such as data back up, security on site, room and space, signed authorities.
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Methods

- Present and discuss presentation material for module 8.
 - Discuss team problems and potential challenges to resolving them.
 - Video – Value Jet (emphasising the role of maintenance processes).
 - Syndicate exercise: “Develop an investigation plan” (1 page for Value Jet).
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MODULE 9: Managing the Investigation Outcomes

Goal

- To achieve competency in managing the investigation outcomes to implementation.
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Aims / Objectives

- Develop skills in organising findings into Judgements of Need.
 - Communicating Judgements of Need to stakeholders.
 - Providing support to teams developing recommendations.
 - Providing support in the development of implementation planning.
 - Providing guidance to the organisation on wider implications of findings (eg. industry, regulator).
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Key Elements

- Discuss the attitude of company owners to investigation findings.
 - Develop understanding of the impact of proposed changes.
 - Develop a communication plan for appropriate stakeholders.
 - Ensuring recommendations ideally come from Line Managers.
 - The politics of findings – resistance to change, and overcoming implied ‘fault’.
 - Higher order recommendations (industry, government level).
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Methods

- Present and discuss presentation material for module 9.
 - Discuss of Judgements of Need – prior to recommendations.
 - Video – Severn Tunnel (emphasising the complex nature of work team interactions and multi-factor causal ‘chains of events’.
 - Syndicate exercise: “Develop an implementation plan” (1 page for Severn Tunnel).
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MODULE A - APPENDICES

Goal

- To achieve competency in the application of module learnings through practice.
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Aims / Objectives

- Appreciate past case studies and their role as examples and not absolutes.
 - Understand the importance of syndicate work in applying and refining skills.
 - Understand the use of templates and pro-formas as aid-memoires for the application of specific tools and techniques.
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Key Elements

- Syndicate exercises.
 - Case studies.
 - Pro-formas for Events and Conditions charting, Fault Tree Analysis and other tools.
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Methods

- Team-based exercises, discussion and feedback to groups, in syndicate groups.
 - Syndicate work in addition to hearing and contrasting other syndicates' work.
 - Videos as case studies:
 - Chunnel Fire, Value Jet, Challenger.
 - Beerburrum, Severn tunnel.
 - Spiral to disaster.
 - Agricultural chemicals.
 - Medical errors.
 - Other aviation examples.
 - Other political examples.
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MODULE B - BIBLIOGRAPHY

Goal

- To achieve competency in referencing selected investigation literature.

Aims / Objectives

- Understand selected reference sources.
- Appreciate the multi-disciplinary basis of investigation.
- Acknowledge the field is expanding and new reference sources are available continually.

Key Elements

- Engineering references.
- Psychology references.
- Management systems references.
- Regulations.
- Legislation.
- Corporate standards and guideline examples.

Methods

- Literature listing and web site listing.
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