



Guidance Notes on the Investigation of Marine Incidents

Incidents & Human Element

- Incidents (accidents and near misses) and their causes must be identified and documented
 - Including the role of humans in incidents
- ABS has created tools to assist in investigation of marine incidents
 - *ABS Guidance Notes on the Investigation of Marine Incidents*
 - ABS Incident Investigation Model

Available for download at:

ww2.eagle.org/en/rules-and-resources/rules-and-guides.html

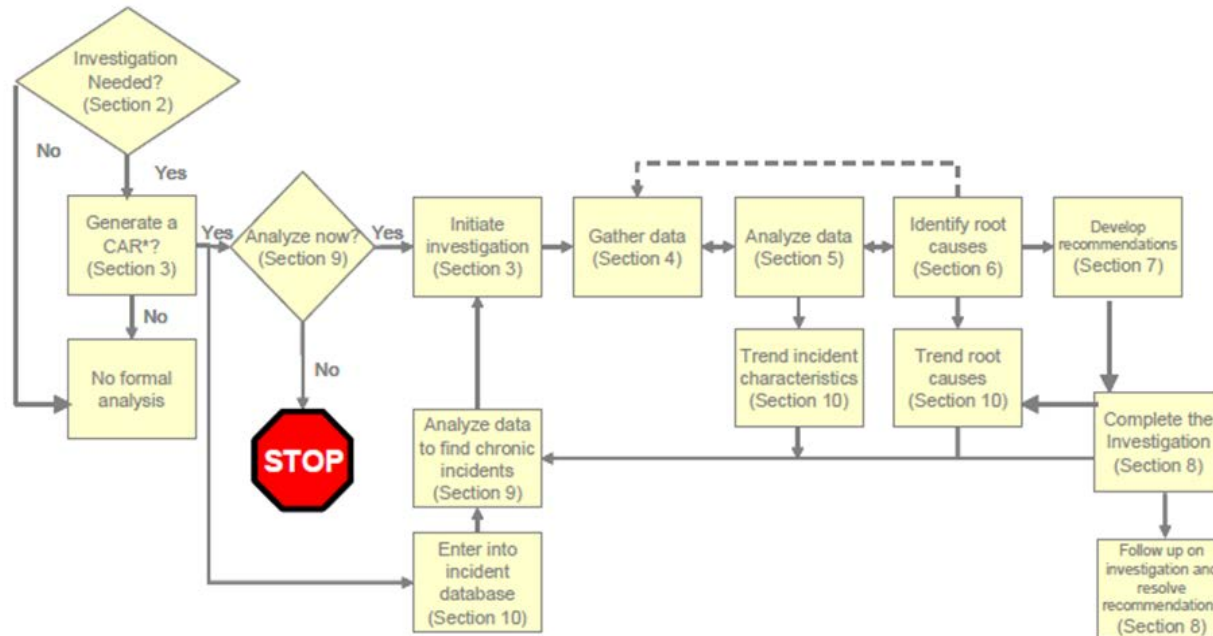


Objectives of ABS Technique

- Provide a technique that:
 - Guides the conduct of investigation and root cause analysis
 - Helps identify, document and trend the causes of accidents and near misses for a variety of incident types:
 - Groundings, collisions, near misses, pollution events, injuries, etc.
 - Supports Class-related activities such as ABS SQE notation, as well as the International Safety Management Code and the International Ship and Port Facility Security Code
 - Supports industry initiative such as Tanker Management and Self Assessment
 - Is sufficiently flexible to allow customization to a client's own management and Safety Management System

ABS Incident Investigation Model

- The ABS Incident Investigation Model below, encapsulates a process for conducting investigations following losses whether they are related to people, structures, machinery, equipment, outfitting or other factors.



Note: CAR is an acronym for Corrective Action Request



Investigation of Incidents

- Appropriate resources shall be applied to investigate incidents
- Varying risk/consequences levels drive:
 - Investigation management
 - Classification of severity
 - Types of investigation teams, techniques, and documentation appropriate for each incident
- Classification of Severity
 - Categories of Incidents are defined in the Guidance Notes as follows:
 - Catastrophic
 - Major Accident
 - Minor Accident
 - Near Miss



Identification of Losses

- Acute losses reported by field personnel
- Chronic losses identified by examining incident data
- Investigation of chronic events focuses on medium to high risks
- The investigation may be performed using techniques such as failure modes effects analysis, fault tree analysis, and 5-whys analysis



Investigation Team

- Comprised of:
 - At least one person knowledgeable in the process or activity involved
 - A team leader with appropriate knowledge and skills to investigate and analyze the incident
 - For catastrophic incidents, a lead investigators may be subject to additional training in advanced investigation approaches

Obtaining the Facts of an Incident

- Gather relevant information of the incident for the subsequent investigation
- The level of effort shall reflect the severity of the incident - greater “Depth of Analysis” for incidents with increasing actual or potential loss
- A stepwise process is provided:
 - Assess needed “Depth of Analysis”
 - Establish a team
 - Data Gathering and Preservation
 - Data Analysis using 5-Whys, Fault Trees, Causal Factor Charts, etc.

Determining Root Causes of the Causal Factors

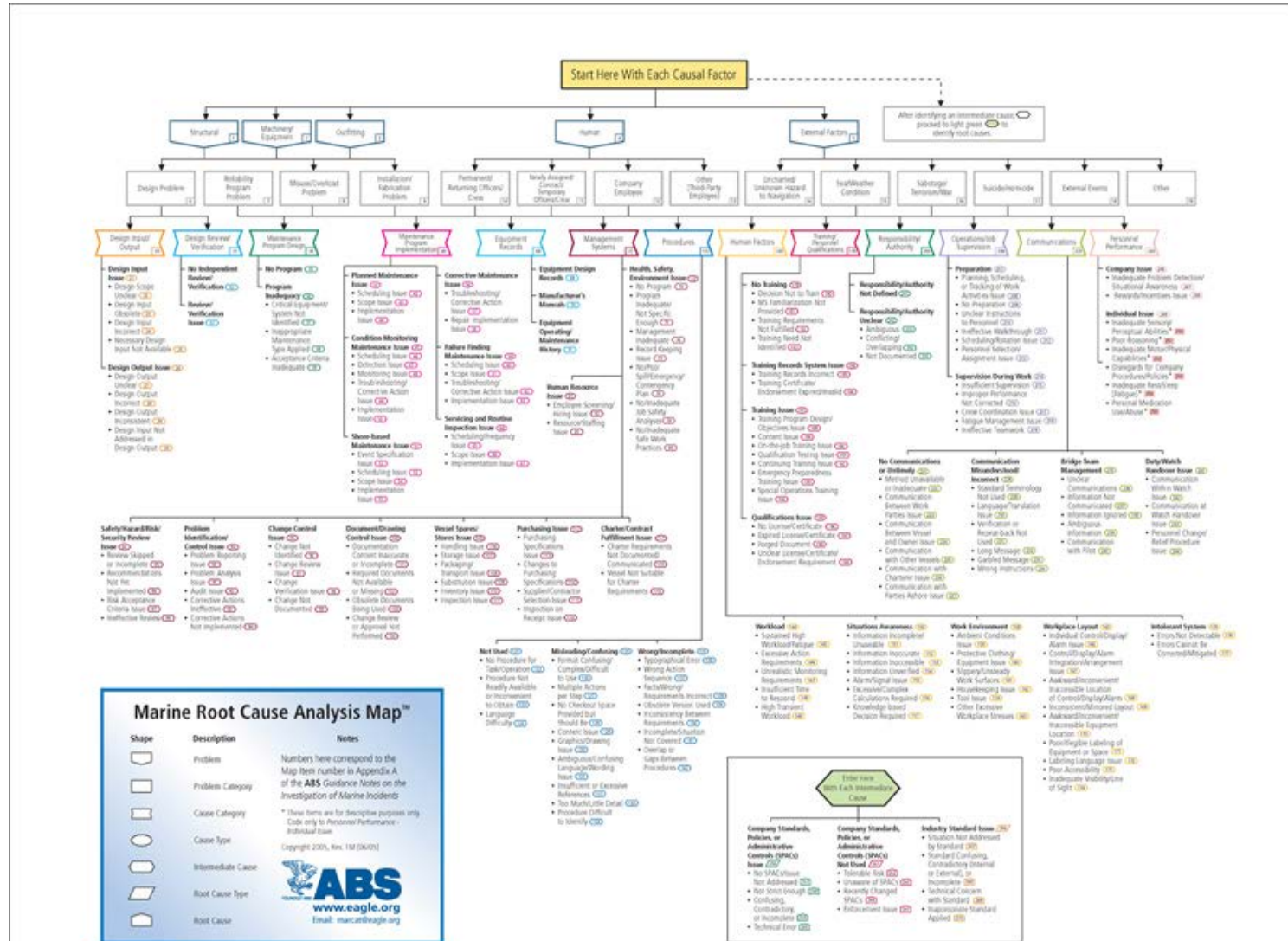
- Identify management system weaknesses that may explain why causal factors existed
- Focus on the management systems that were in place to monitor and control the human activities and equipment integrity/reliability
- Use the Marine Root Cause Analysis Map to provide structure and consistency to the results
- Document paths through the Marine Root Cause Analysis Map

Root Cause is defined as the depth in a chain of events to a level where an intervention could reasonably be identified, and where management has the power to implement change and thereby prevent re-occurrence.

Root Cause Analysis Map

- Root Cause map has been “marinized” based on reviews of hundreds of marine accident reports
 - Reported causes, cause categories, etc.
 - Taxonomy of root causes constrained, comprehensive.

Root Cause Analysis Map



Determining Loss Potential

- Consider Potential as well as Actual Consequences
- Make Qualitative versus Quantitative Estimates
- Use a Loss Potential Matrix
- Consider Probability of Recurrence Estimates
- Be Realistic about Potential Consequences

	Consequence (Potential)				
	Minor	Serious	Major	Catastrophic	
	First Aid / Medical Treatment	Lost Work Day	Disability	Fatality	Personnel
	No effects outside vessel, not reportable	Recordable event requiring outside notification	Significant impact outside vessel and reportable	Release with long term effects or irreparable damage	Environmental
	10K or less	More than 10 K but 100 K or less	More than 100 K but 1M or less	More than 1M	Property Damage Costs
	10 hours or less	More than 10 hours but 1 day or less	More than 1 day but 7 days or less	More than 7 days	Schedule
Frequent One time per 20 voyages	Medium	High	High-High	High-High	
Occasional One time per 500 voyages	Medium	Medium	High	High-High	
Seldom One time in life of fleet	Low	Medium	High	High	
Unlikely - One time in 40 years in the industry	Low	Low	Medium	Medium	

Develop Recommendations for Each Causal Factor

- Recommendations:
 - Level 1: Address causal factors
 - Level 2: Correct the intermediate causes discovered as part of the investigation
 - Level 3: Correct similar problems that exist on the vessel or in other areas of the organization (other vessels and/or shore facilities)
 - Level 4: Reduce likelihood of reoccurrence

Reporting Requirements

- Reports contain:
 - Date and time of the incident
 - Date and time the investigation started
 - A description of the incident
 - Identification of causal (contributing) factors
 - Identification of root causes
 - Recommendations from the investigation
 - List of investigation team members and their roles

Reporting Requirements

- The level of reporting detail required is related to the risks associated with an incident.
- Additional documentation may include:
 - Parts testing/examination reports
 - Witness statements
 - Causal factor chart
 - Fault tree
 - Incident investigation forms
 - Test plans
 - Photographs or videotapes
 - Maps and diagrams, etc.



Follow-up to Investigation Recommendations

- Recommendations tracked to resolution
- Need for tracking form
- Reasons for rejecting recommendations
- Tracking recommendation status
- Documentation of final resolutions
- Trending: Requirements to database findings and periodic review

Training Requirements

- Entity undertaking incident investigation needs to address:
 - Training Policy
 - Role of Safety Manager
 - Requirement for Team Leaders
- ABS has a Guidance Note available to download to familiarize interested parties called the:
 - ABS Guidance Notes on the Investigation of Marine Incidents

Summary & Conclusion

- It's important (and often required) to identify the factors and root causes of accidents and incidents
- Processes and tools are available to reliably identify these factors and root causes, including
 - **ABS Guidance Notes on the Investigation of Marine Incidents**
- Applying these techniques will promote consistency in the investigations, and allow subsequent analysis of trends



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