



“The Human Factor in Marine Claims”

IUMI 2005

Amsterdam

September 2005



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**”Man is a creature made at the end of the week
when God was tired”**

Mark Twain



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Human Error Caused Claims

(Industry extrapolated)

- 541\$m a year
- 45\$m a month
- 11\$m a week
- 1.5\$m a day



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Human Error Claims are a major problem to Insurers



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They are also a major problem to owners

- **Increased Insurance Costs**
- **Increased Management Costs**
- **Loss of Image/Reputation**
- **Loss of Business**
- **Loss of Profit**



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..... and to employees

Loss of profits means loss of jobs



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Human Error affects us all top to bottom



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- 
- **Why Human Error**
 - **What is Human Error**
 - **“No Room for Error”**



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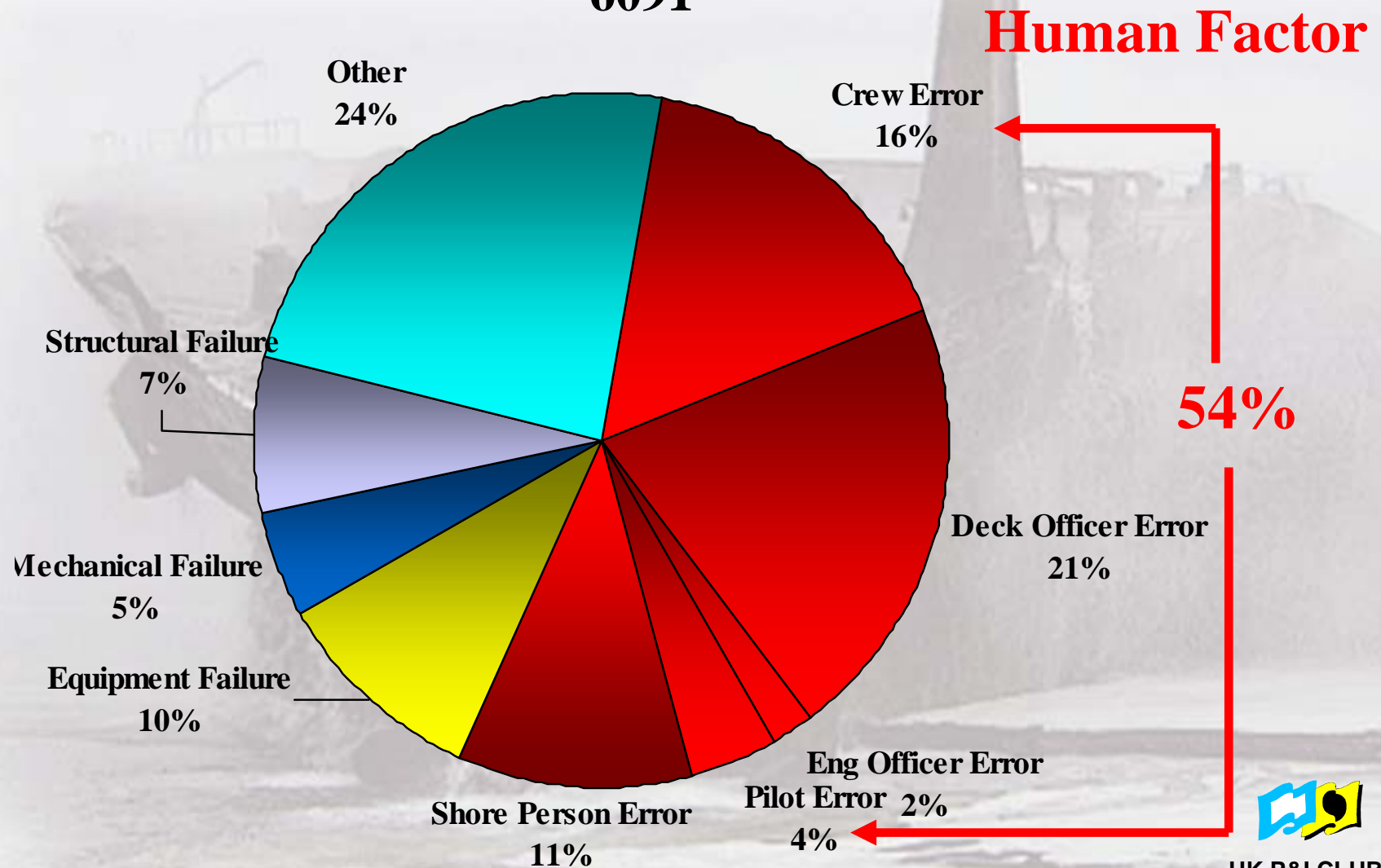
Why Human error



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Main Cause Number

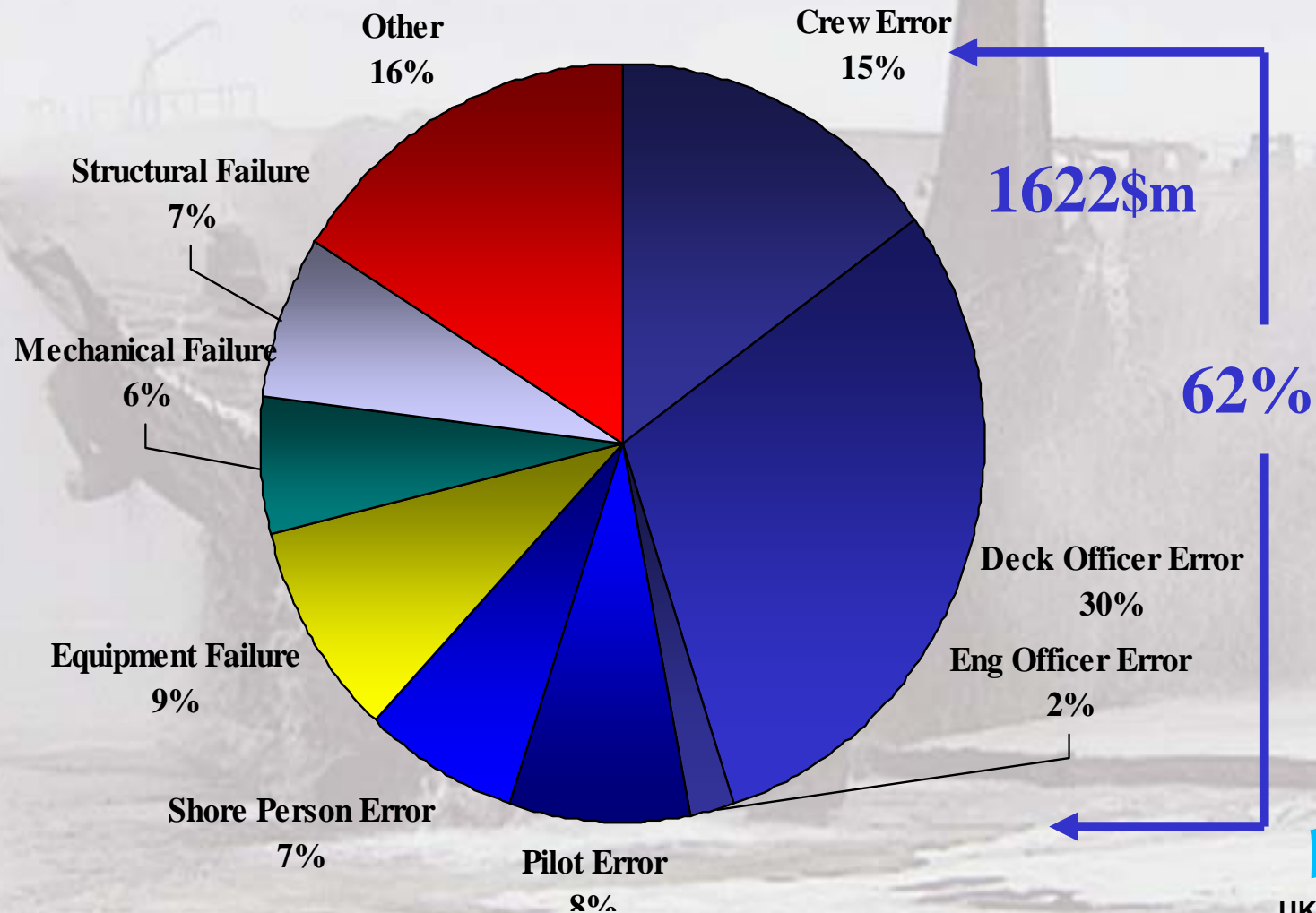
6091



Main Cause Value

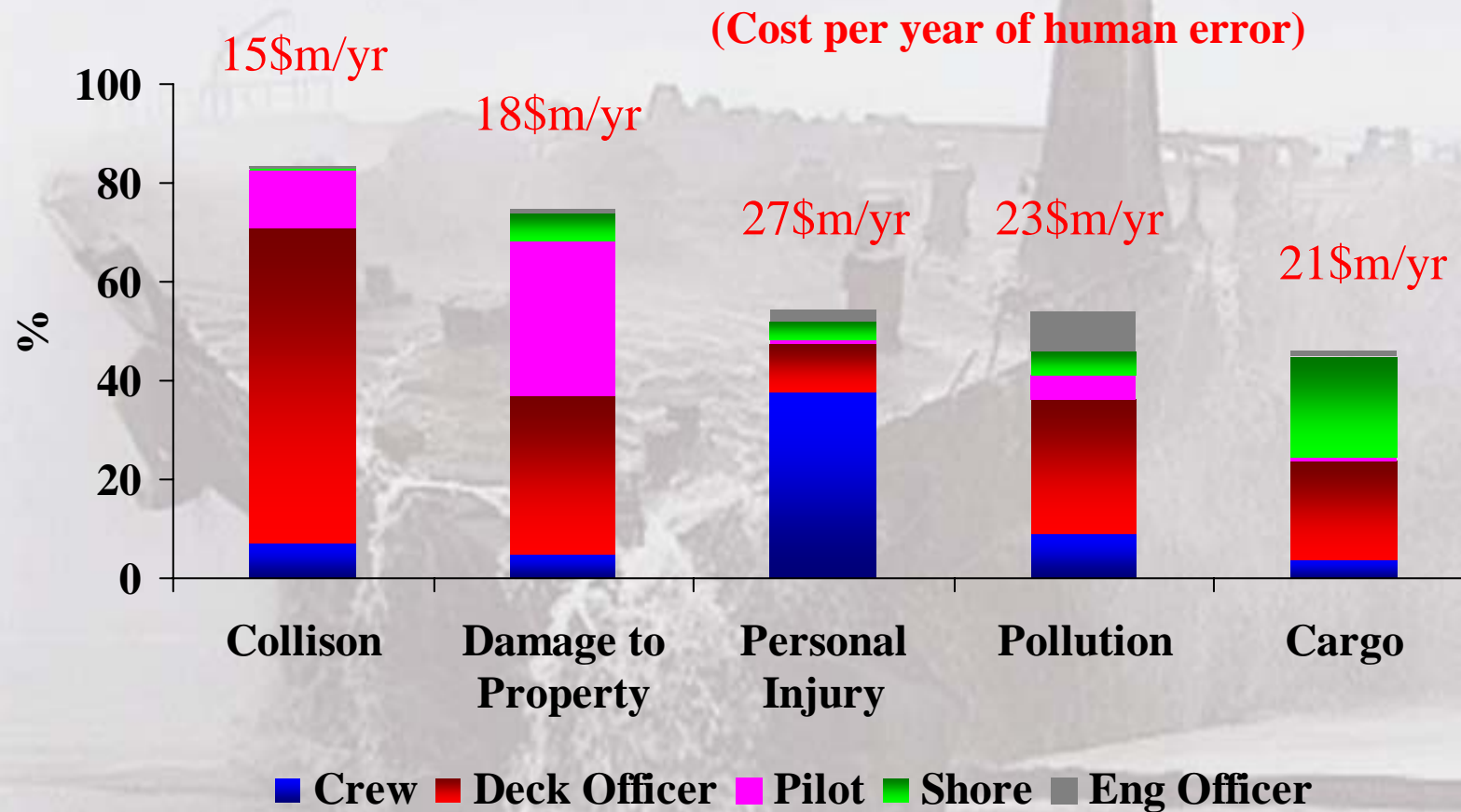
2616\$m

Human Factor



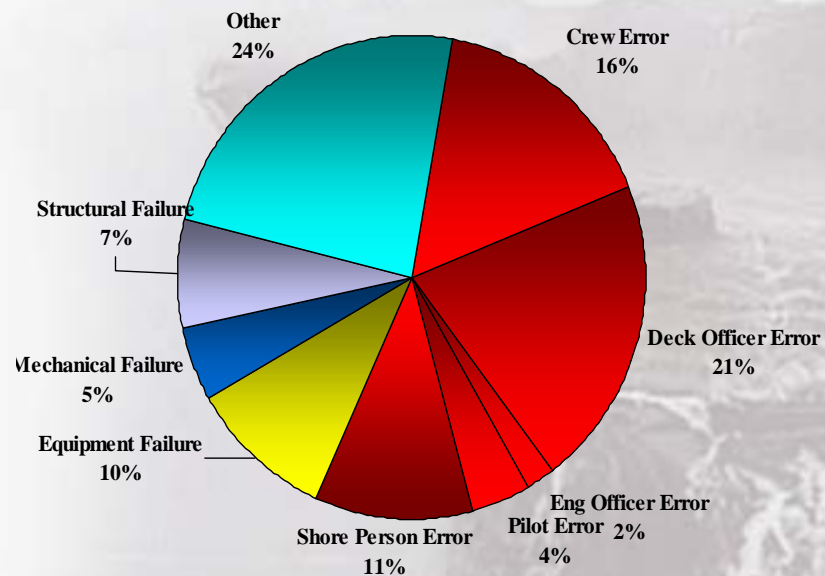
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Percentage Input of Human Factor in each Major Risk Area

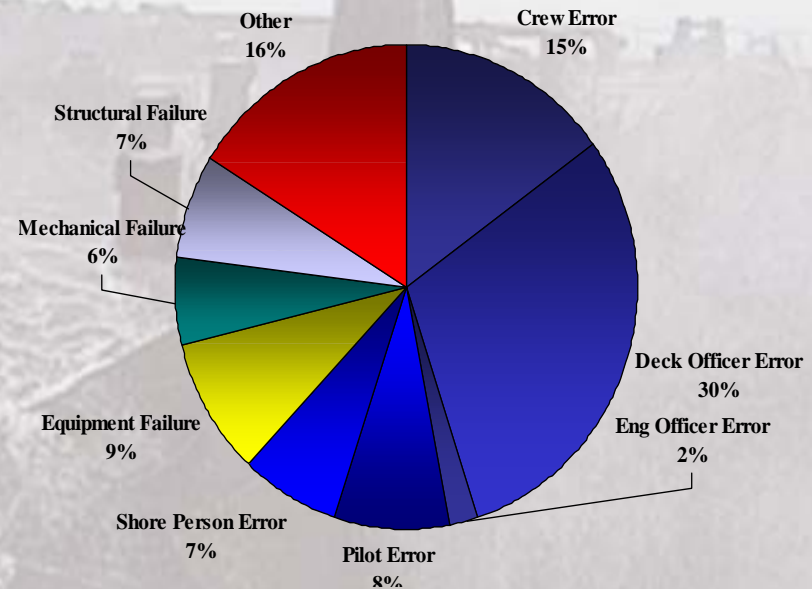


What is the Cost Benefit

Number



Value



Just a 10% reduction in human error = 11\$m savings a year



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Do we Really see this much
human error in our industry



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Cargo



Angle of loll problem



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Cargo



Stevedore care



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Cargo



Shipper care



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Cargo



Shipper care



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Personal Injury



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Personal Injury



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Personal Injury



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Personal Injury



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Personal Injury



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Property



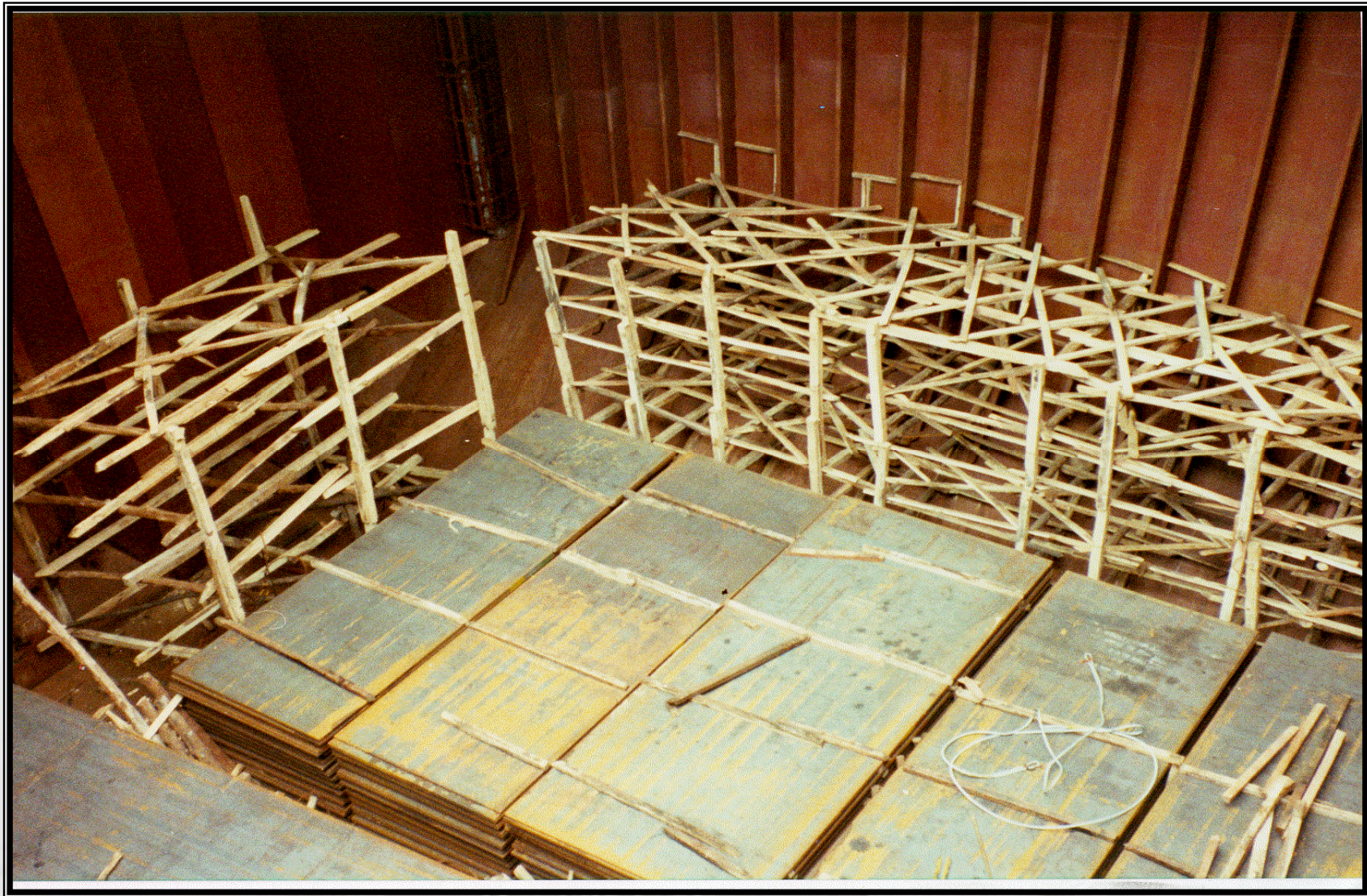
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Sophisticated Cabin Heating



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A work of art



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However the Marine Industry is not alone in making mistakes



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But what is human error

Before we can tackle it we must define it



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A Human Error Incident

- An **unplanned event** which occurs when an **uncontrolled hazard** meets an **undefended target**



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Most Incidents Consist of

- **Hazard**
 - Energy source, condition etc that causes or has the potential to cause injury damage or loss i.e. sources of extreme heat, materials under pressure, flammable material, toxic material, moving equipment, weather
- **Target**
 - Victim or object of harm i.e. people, assets, environment, reputation
- **Event**
 - A happening or change of state whereby this target is adversely affected, i.e. a collision, explosion, oil spill



..... usually involve

- **Breach** of an existing hazard **controls/** target **defences**
- **Intended** or **Unintended** act by a human
- **Chain** of events



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.....and virtually always involves

- People at the sharp end**



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Lets look closer at

- **Breach** of an existing hazard controls/
target defences
- **Intended or Unintended act by a human**
- **Chain** of events

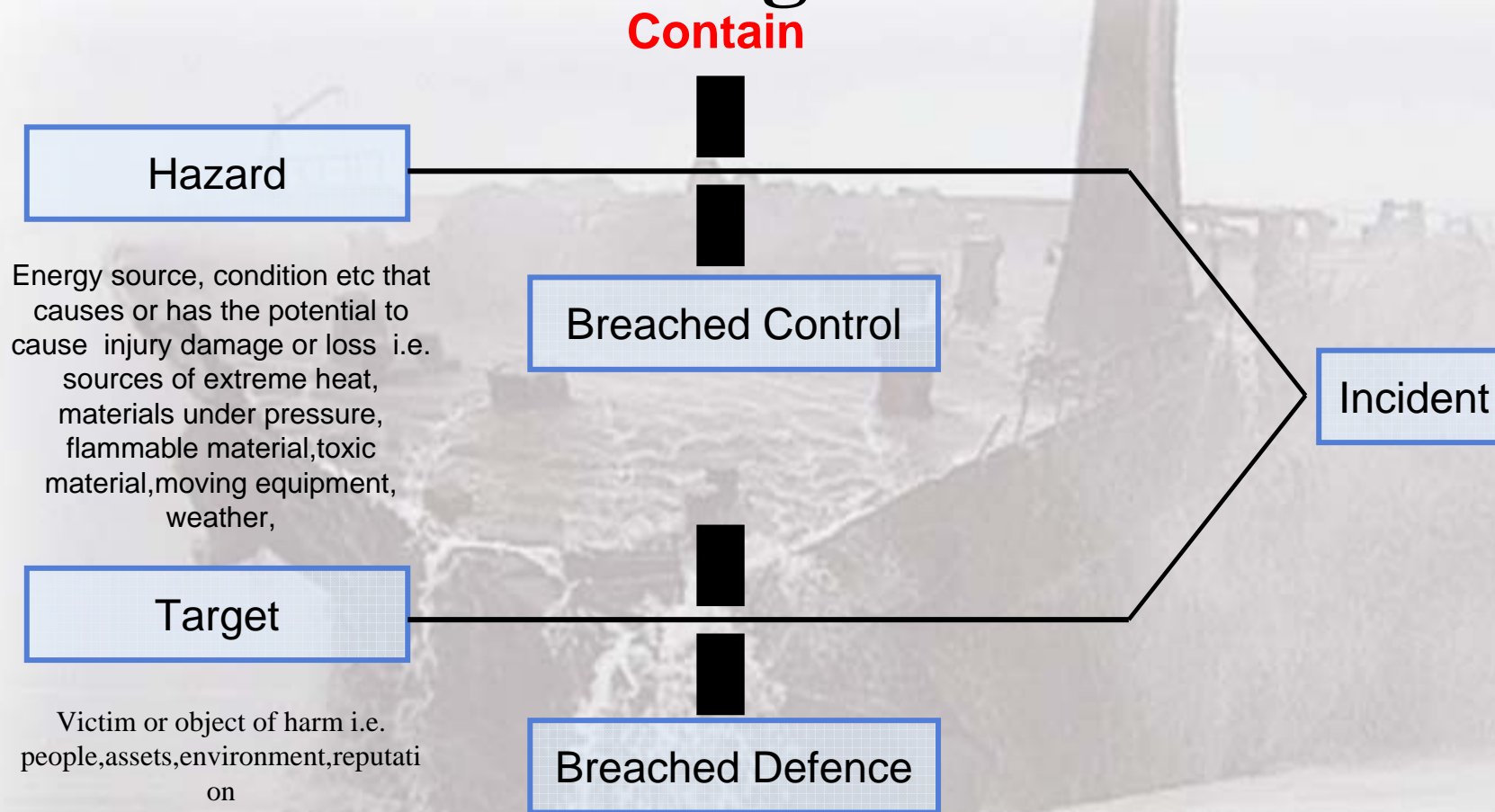


- 
- **Breach** of an existing hazard controls/
target defences
 - Intended or Unintended act by a human
 - Chain of events



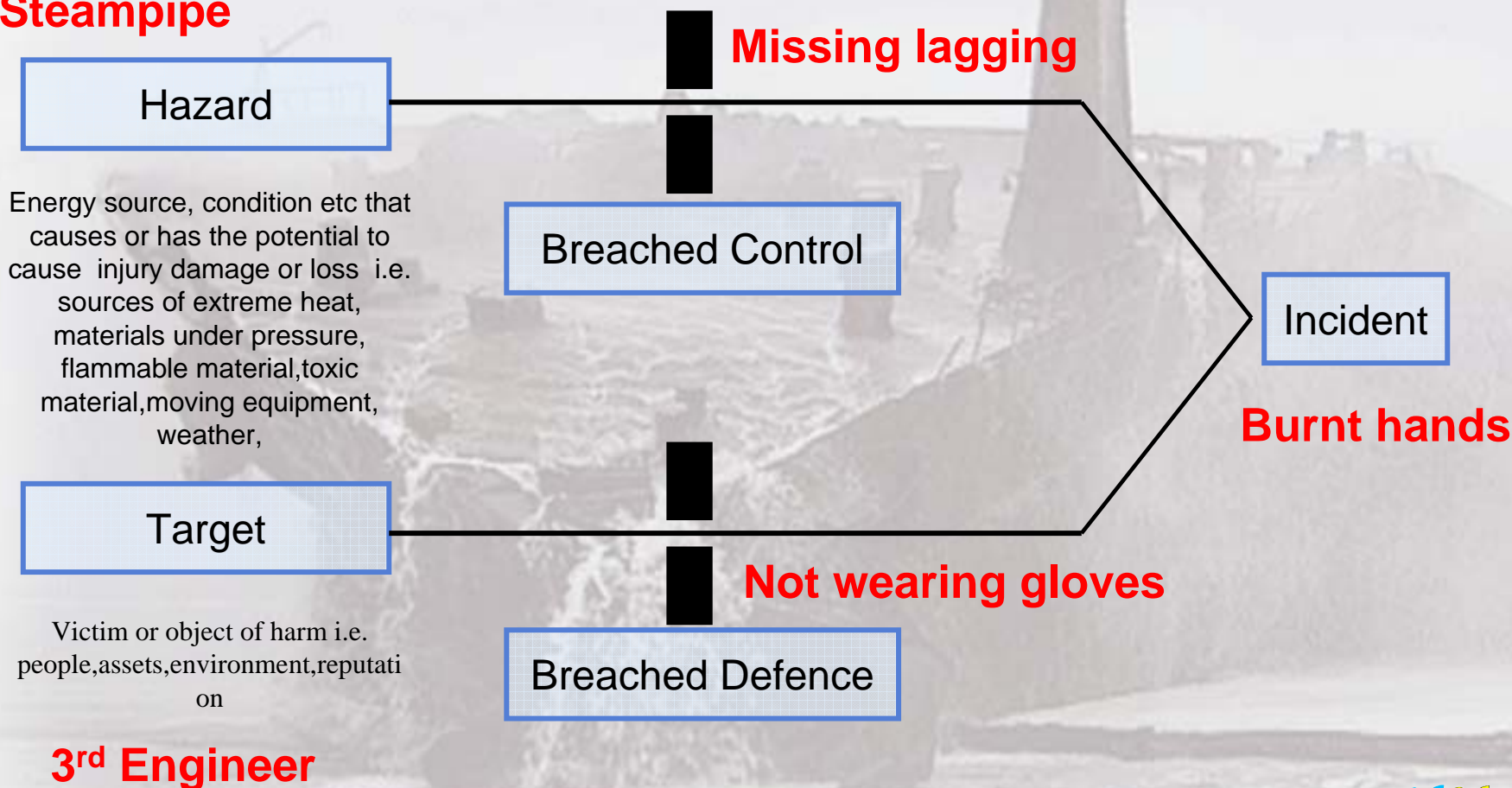
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Breach of an existing hazard controls/ target defences



Breach of an existing hazard controls/ target defences

Steampipe

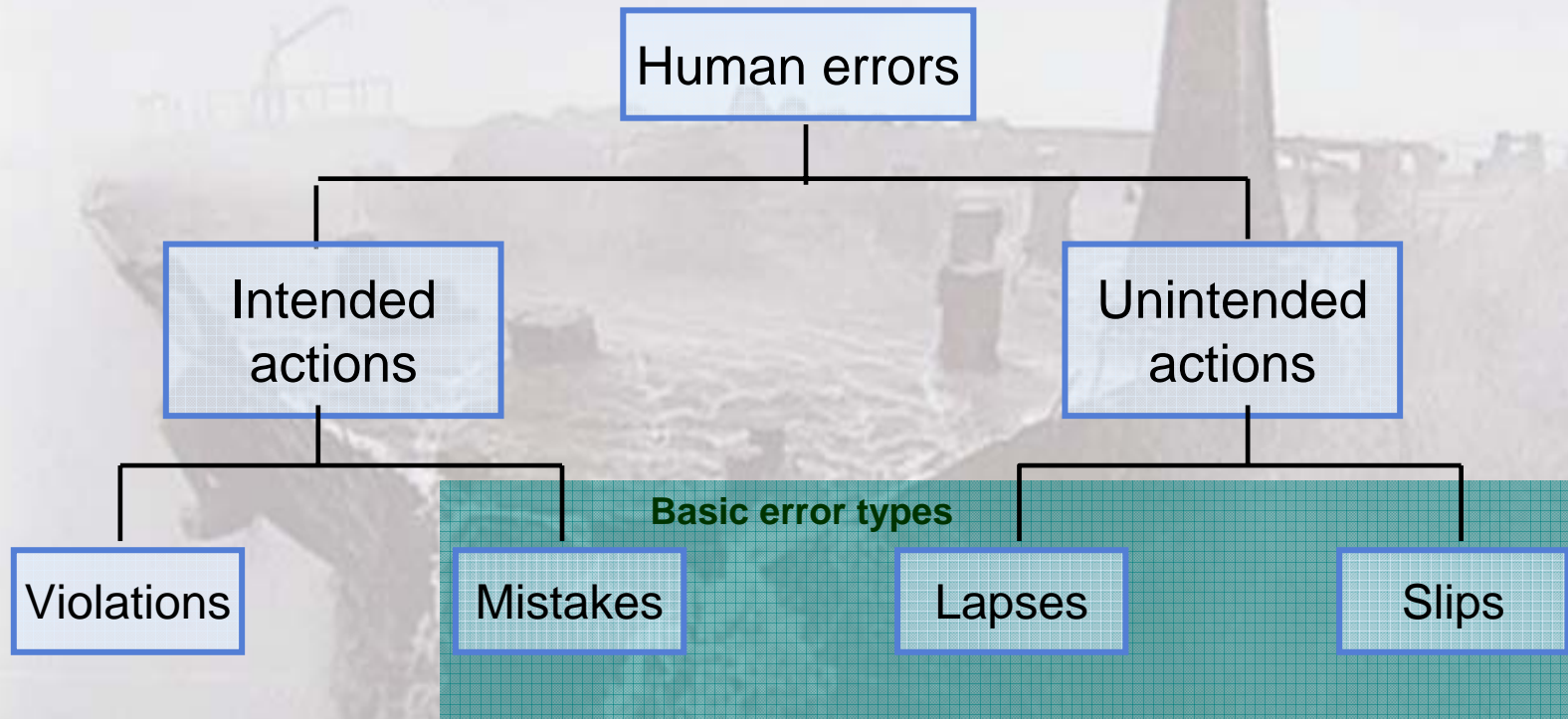


- 
- A faded background image of an offshore oil rig at sea. The rig has a tall derrick and various structures on its deck. The sea is visible in the foreground, and the sky is overcast.
- **Breach** of an existing hazard controls/
target defences
 - **Intended or Unintended act by a human**
 - **Chain of events**

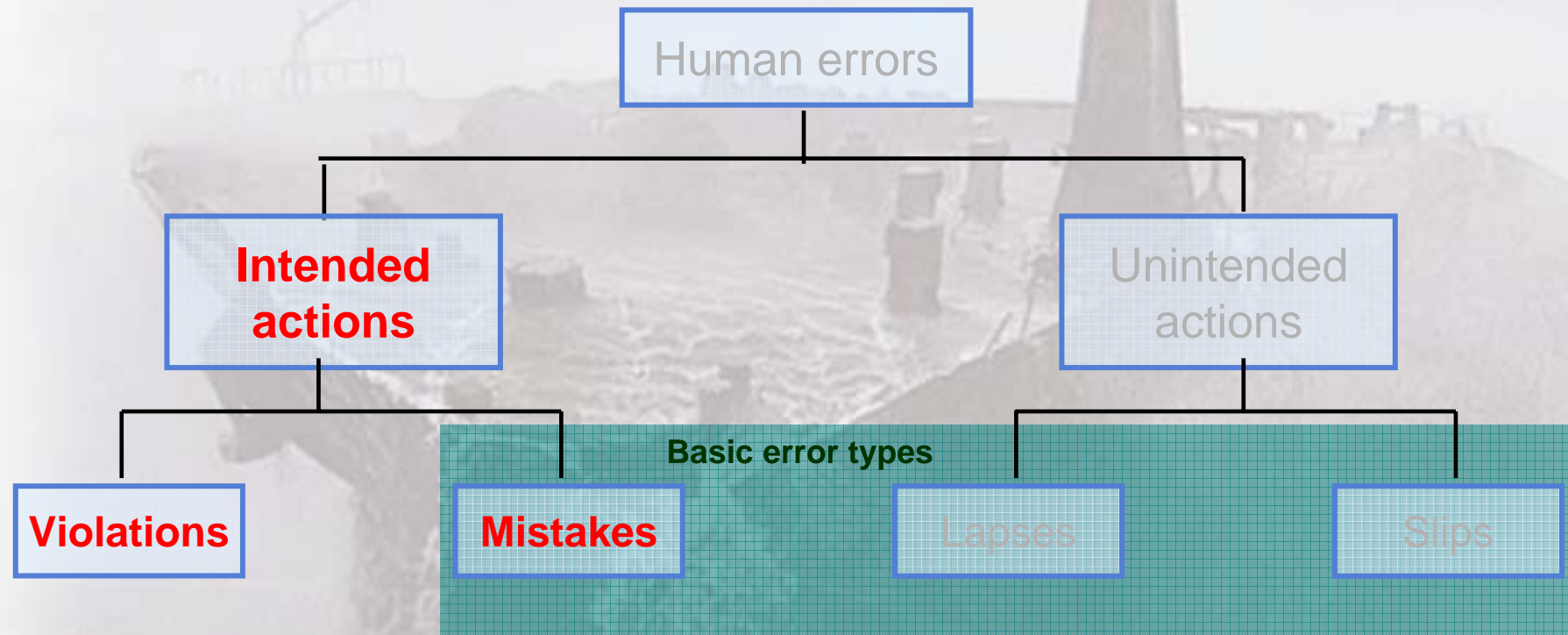


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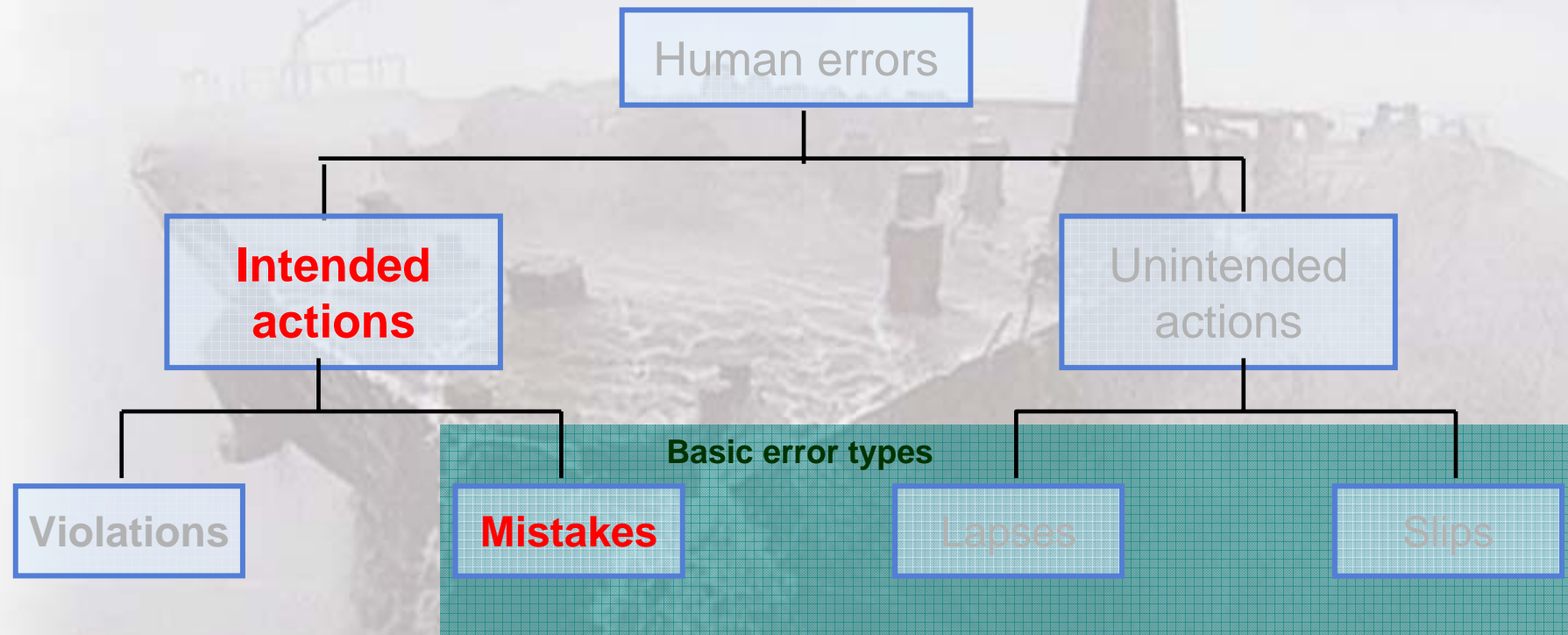
Intended or Unintended Act



Intended Actions



Intended Actions



Mistakes

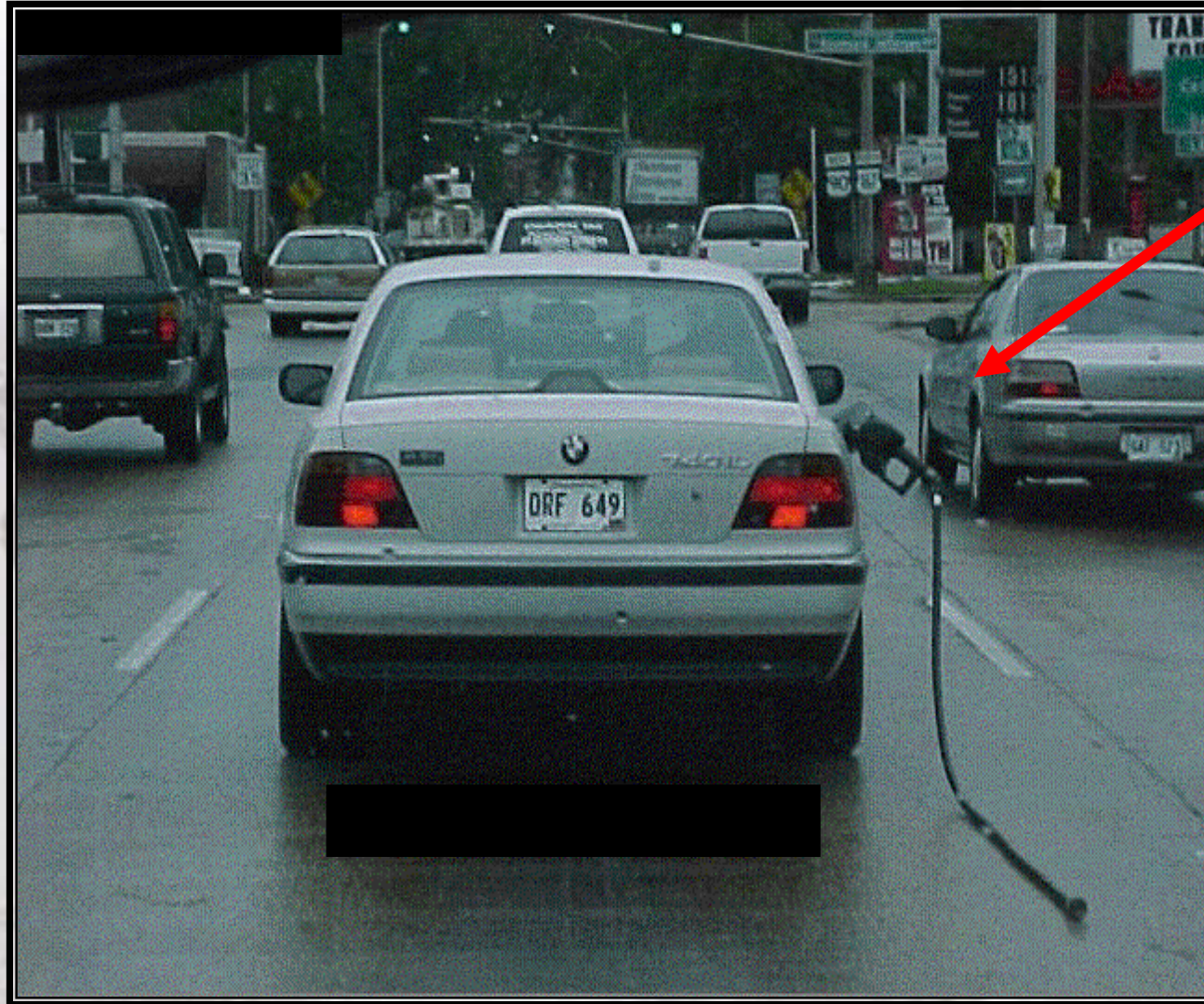
We usually make mistakes at 3 levels

- **Skill based mistakes (Unintended)**
 - **distraction**
- **Rule based mistakes**
 - Intended action inappropriate to the circumstances
 - Right rule, wrong time !!
 - Misinterpretation coll regs crossing/overtaking
- **Knowledge based mistakes**
 - Erroneous judgement in a situation not covered by the rules



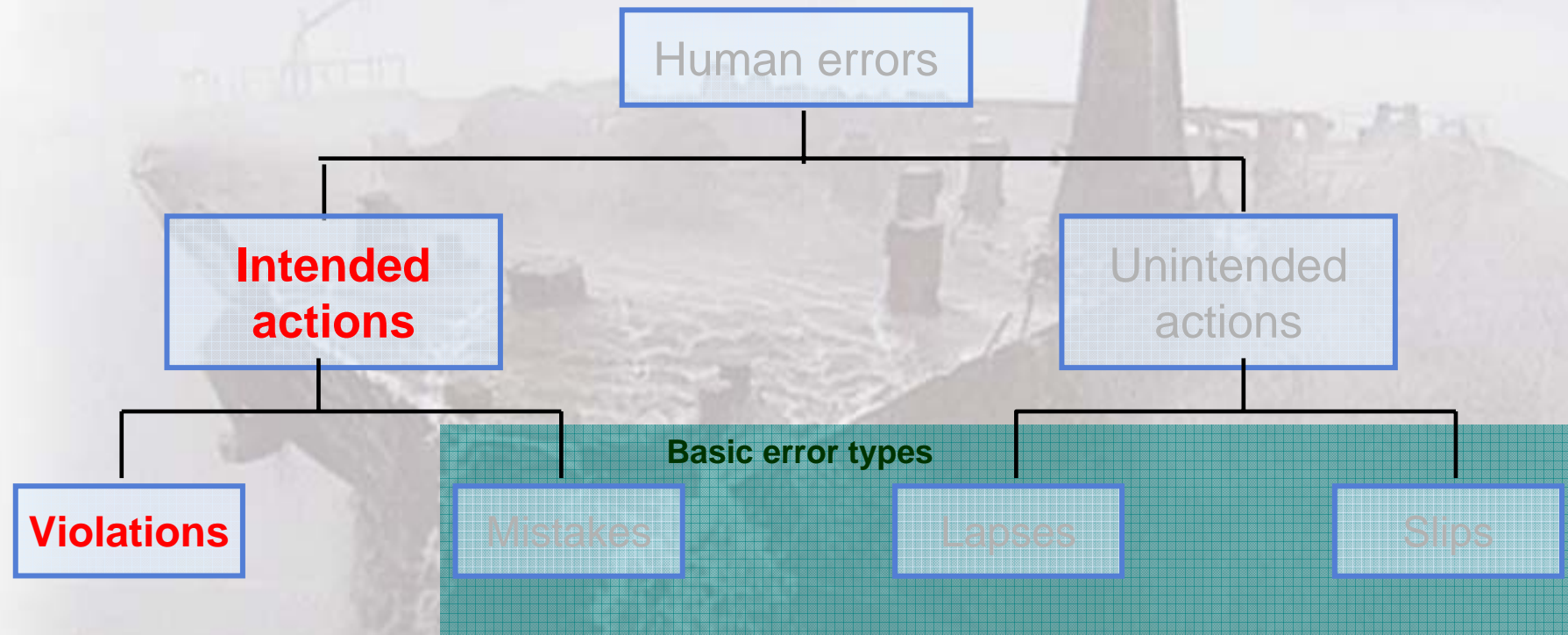
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Skill Based



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Intended Actions



Violations

Deliberately breaking a rule to achieve a goal
(Source motivational/deliberate)

- **Routine violations** – almost invisible until there is an accident (or sometimes as the result of an audit)
 - “we do it like this all the time”
 - speeding
- **Exceptional violations** – unforeseen and undefined situations – “now this is what we got trained for”
 - re writing procedures on the fly
- **Situational violation** – standard problems that are not covered in the procedures – “we can’t do it any other way”
 - Train coupling
- **Optimising violations** – corner cutting, thrill seeking – “I know a better way of doing it”
 - Passing ships, Hole in the Wall
- **Act of sabotage** – deliberate violation for malicious reasons – falls outside the scope of most accident/incident scenarios



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Routine Violation ?

3/0 listening to J Lo



Almost invisible until there is an accident ?



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Situational rule violation the railway shunter



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Situational rule violation ?



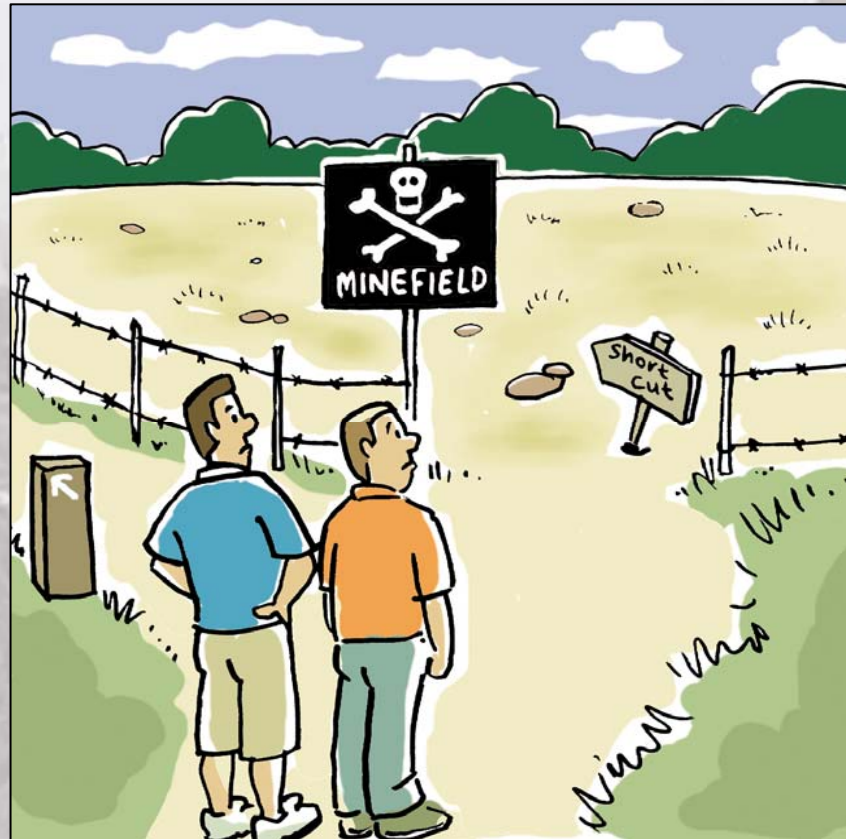
standard problems that are not covered in the procedures

– “we can’t do it any other way”



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Optimising violations we've all done this!

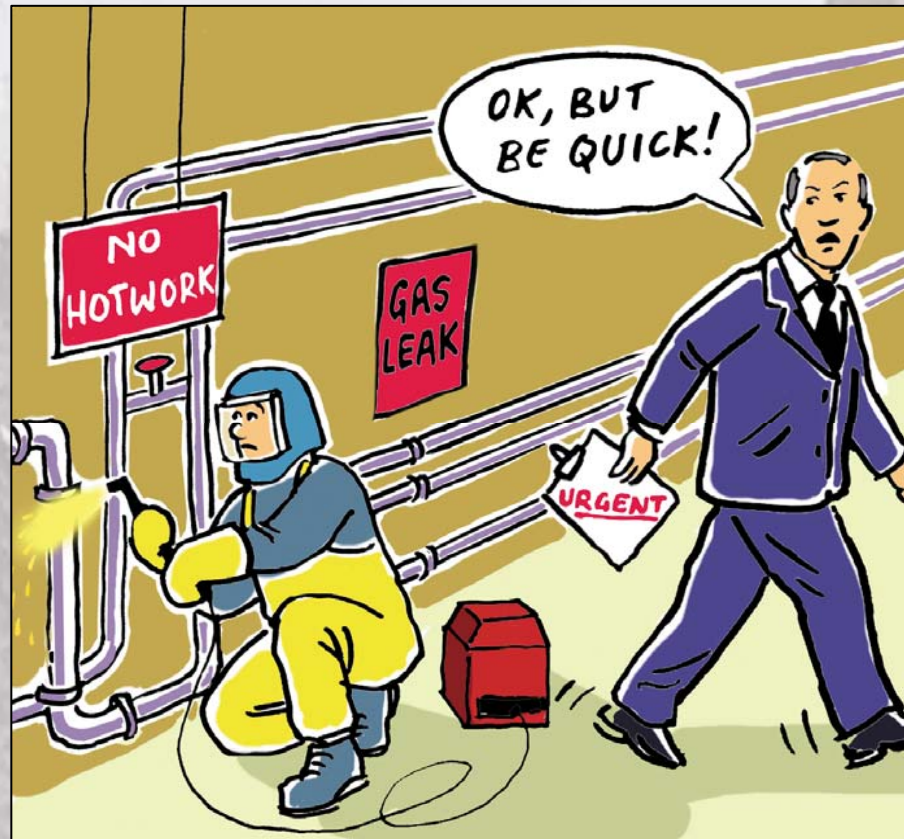


Corner cutting



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**Exceptional violations
and I want this.....and by the way.....be safe!**



unforeseen and undefined situations



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Violations

- We all violate the rules (as you have already demonstrated)
- Interestingly however rule violators tend to believe that nobody else violates the rules, at least not at the same time! (Overtaking on bend)
- At best you only control your own side of the equation – remember you do not control the “other driver” or the ever changing environment in which we live
- While mistakes do not always increase the possibility of an accident happening (taking your eyes off the road while driving) – **rule violations nearly always do (driving through a red light)** – they must because what you are doing is moving outside the “declared scope” of allowable safe action





Do we violate at sea



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Some common violations seen daily on board

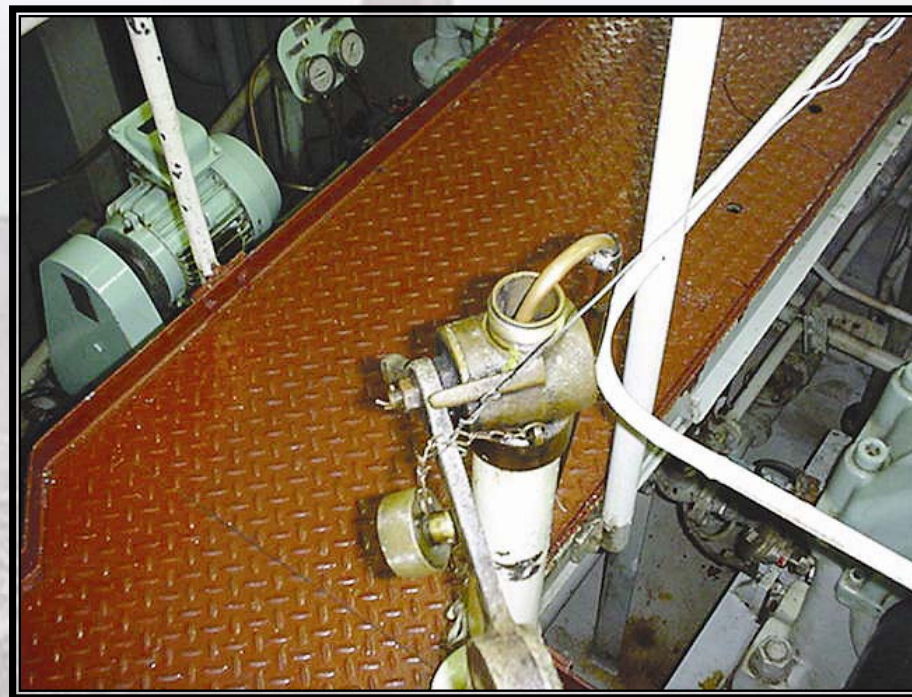


Deadman lashed
in open position

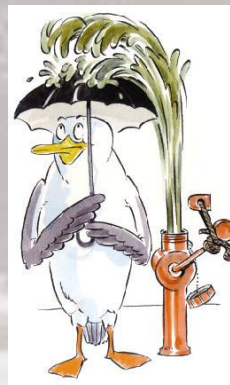
Glass
replaced with
plastic tube



Daily use tank

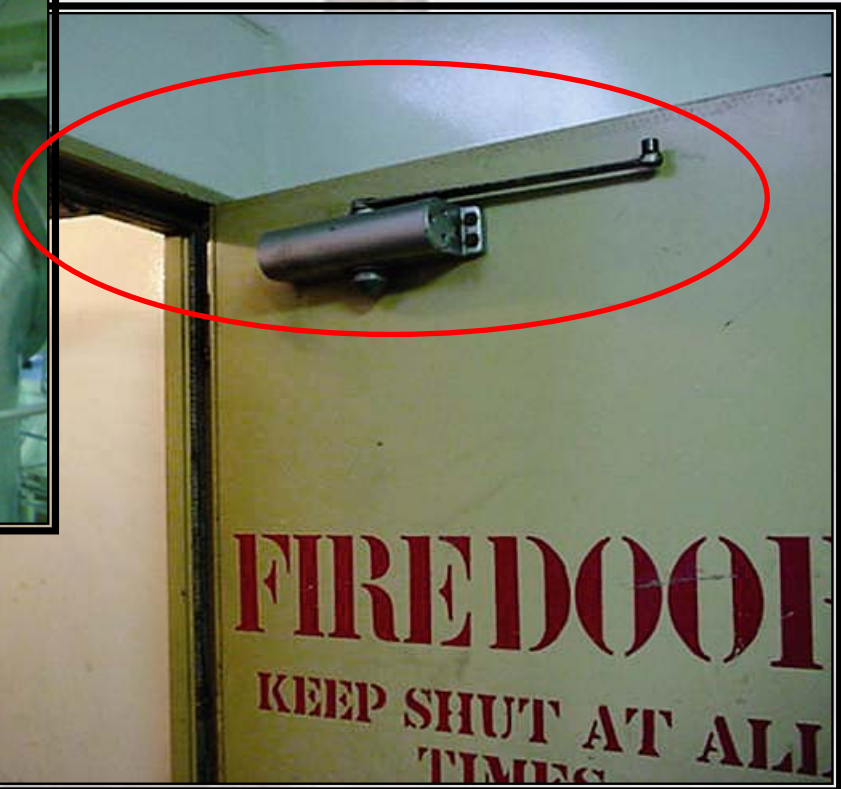


DB Sounding pipe



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“Violations”



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“Violations”

Before



After



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Sheep and wolves

Studies have identified two sorts of people – sheep and wolves
(**wolves accept violation as a norm** – sheep do not)

- There are sheep in sheep's clothing
- There are wolves in wolf's clothing
- There are also sheep in wolf's clothing
- But the largest group are wolves in sheep's clothing
– they haven't violated. **Yet !!**





What are you !!!!!!!



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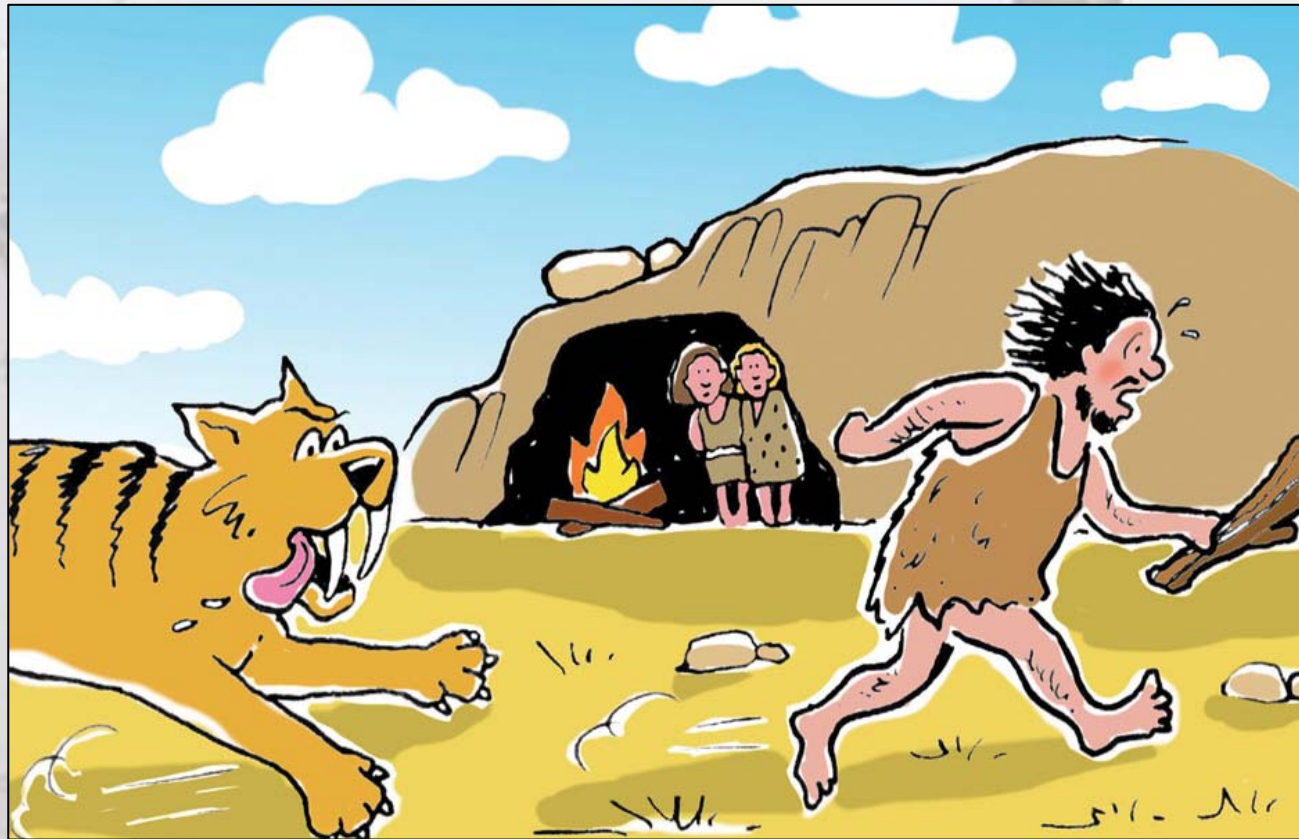


Don't get too depressed if you're a wolf



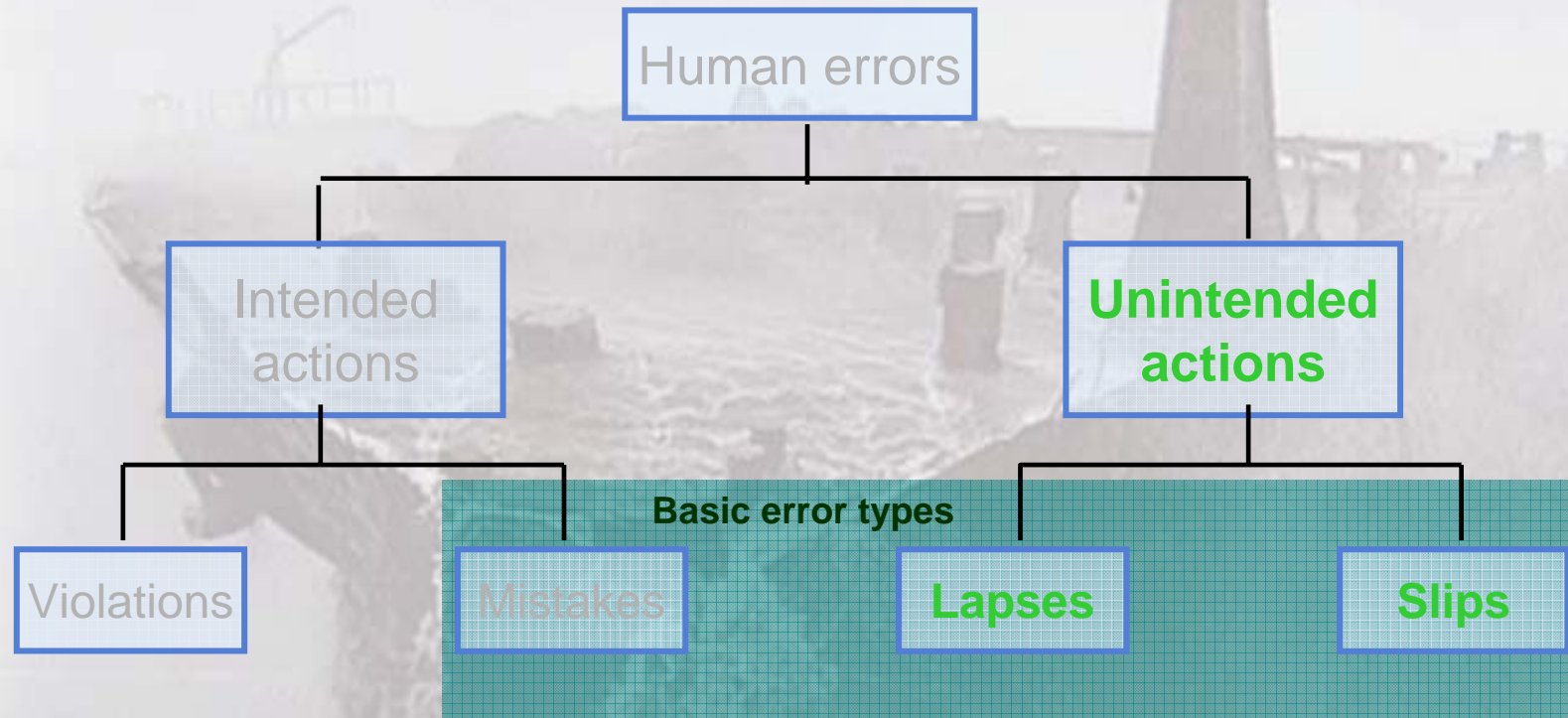
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**without violators we wouldn't have got out of
the caves**



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Unintended Actions



Slips/Lapses

- Slips

- Attention failure
- Mistiming/Distraction
 - Knocking over a glass while attempting to pick it up



- Lapses

- Memory failures
- Omission of planned action
 - Forgetting to wear a hard hat
 - Forgetting to take lens covers off



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These errors can be magnified by

- **Creeping Entropy**
- **Routinisation**
- **Normalisation**
- **Intrinsic Hazards**
- **Murphy's Law**



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•Creeping Entropy

- Systems, procedures growing old
- Need to continually review



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•Routinisation

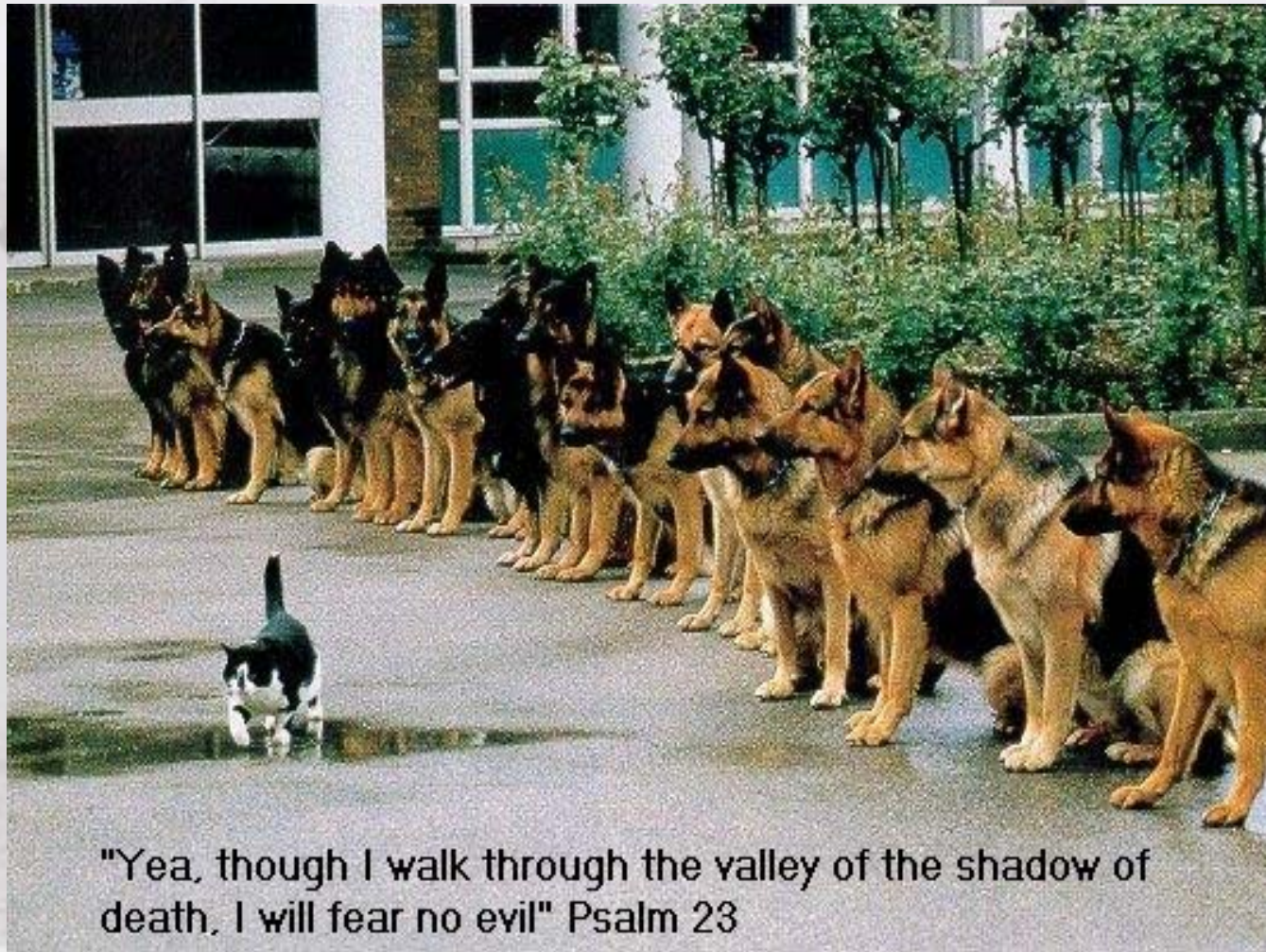
- Skilled professionals doing things automatically
- Travelling to work



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•Normalisation

- forgetting to be afraid
 - Tank entry
 - Cargo operations (heavy weights)



"Yea, though I walk through the valley of the shadow of death, I will fear no evil" Psalm 23



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•Normalisation

- forgetting to be afraid



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•Intrinsic Hazards

- Putting your head above the parapet
- It's dangerous out there



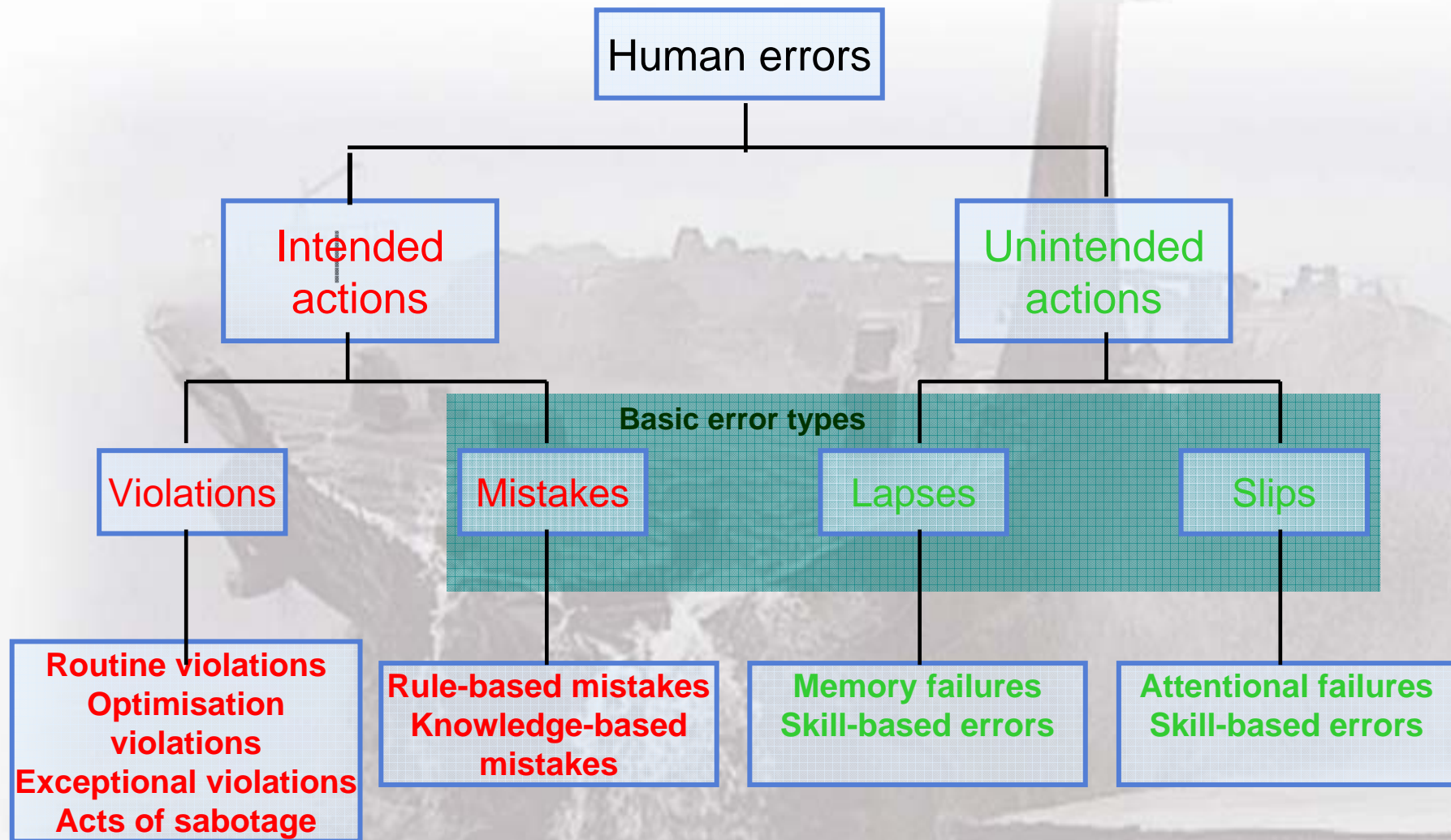
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•Murphy's Law

- If it can happen it will happen
- Schulz's Law



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Highly experienced people

Inexperienced people



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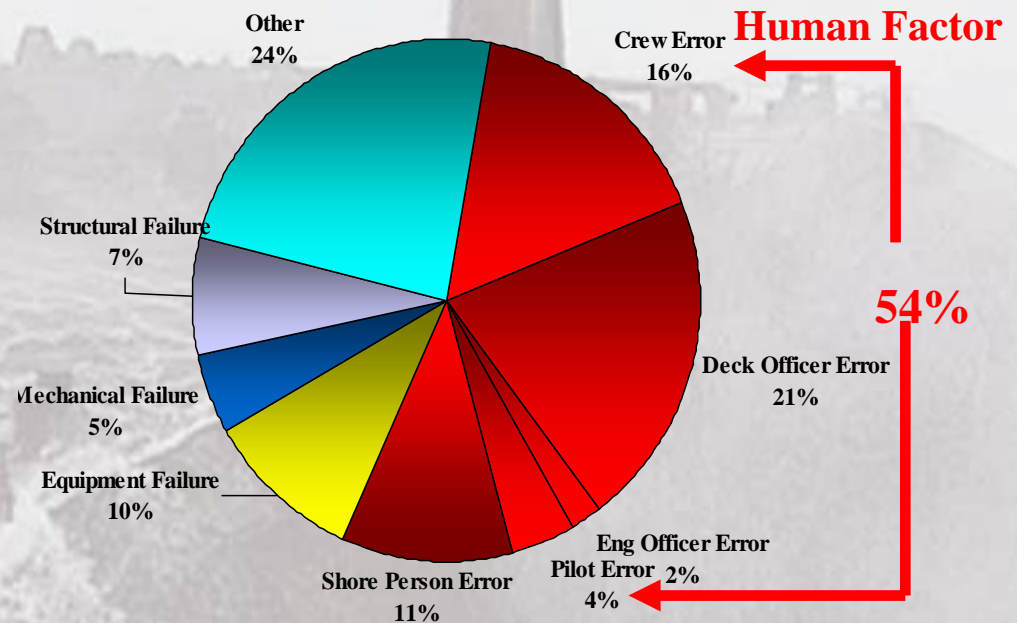
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Chain of Events

- **Active Failure**
 - Proximate
- **Latent Failure**
 - Underlying causes
 - Latent failures create the conditions in which active failures are more likely



Kings Cross Fire

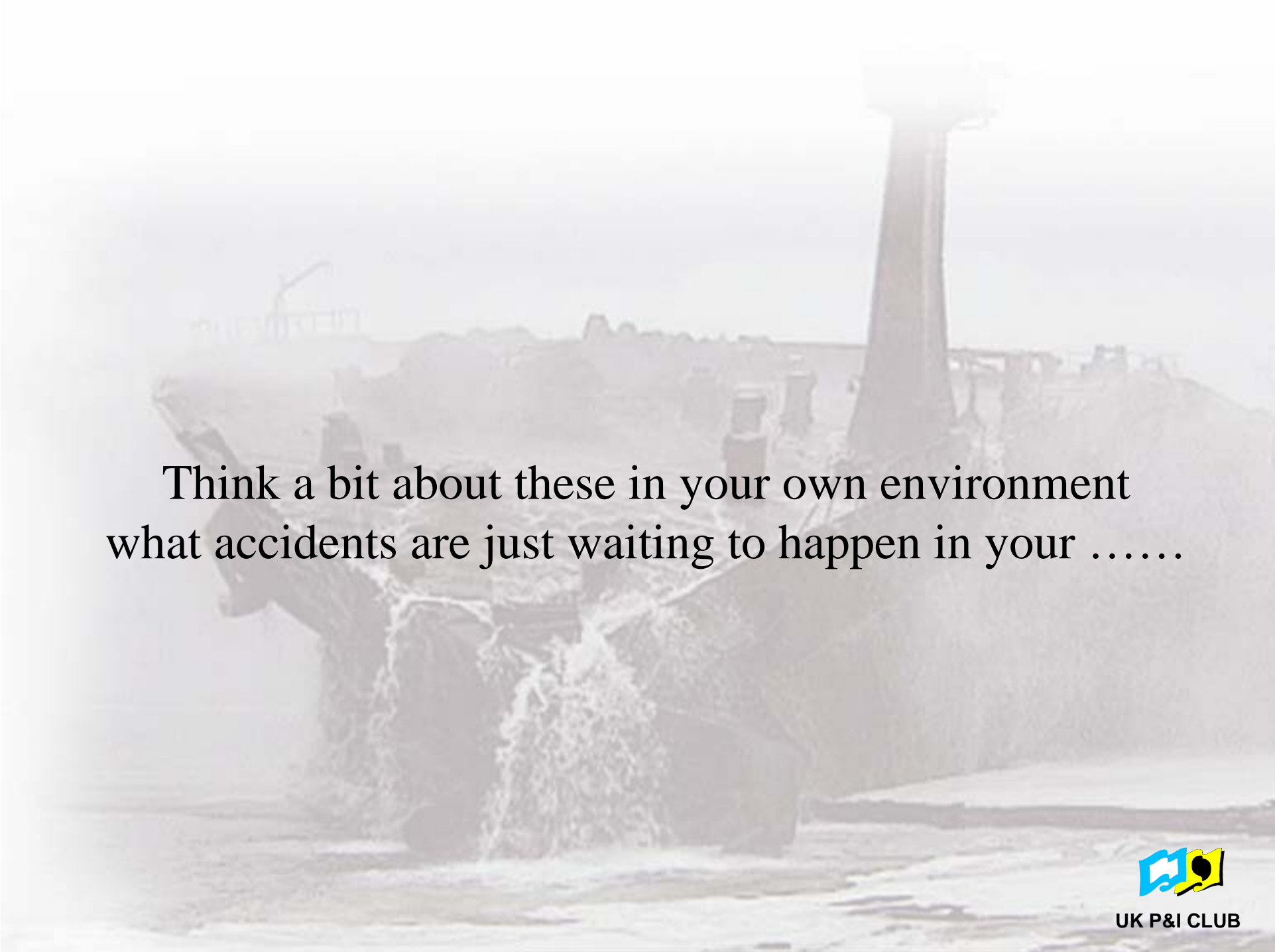
- **Active Failure**
 - Discarded cigarette
- **Latent Failure**
 - Wooden Escalators
 - Poor fire fighting/detection equipment
 - Refuse soaked in flammable material



Latent Failures are Lurking

- Hardware
- Design
- Maintenance
- House Keeping
- Procedures
- Organisation
- Training
- Incompatible Goals
- Error Enforcing Conditions
- **Communications**
- Defences



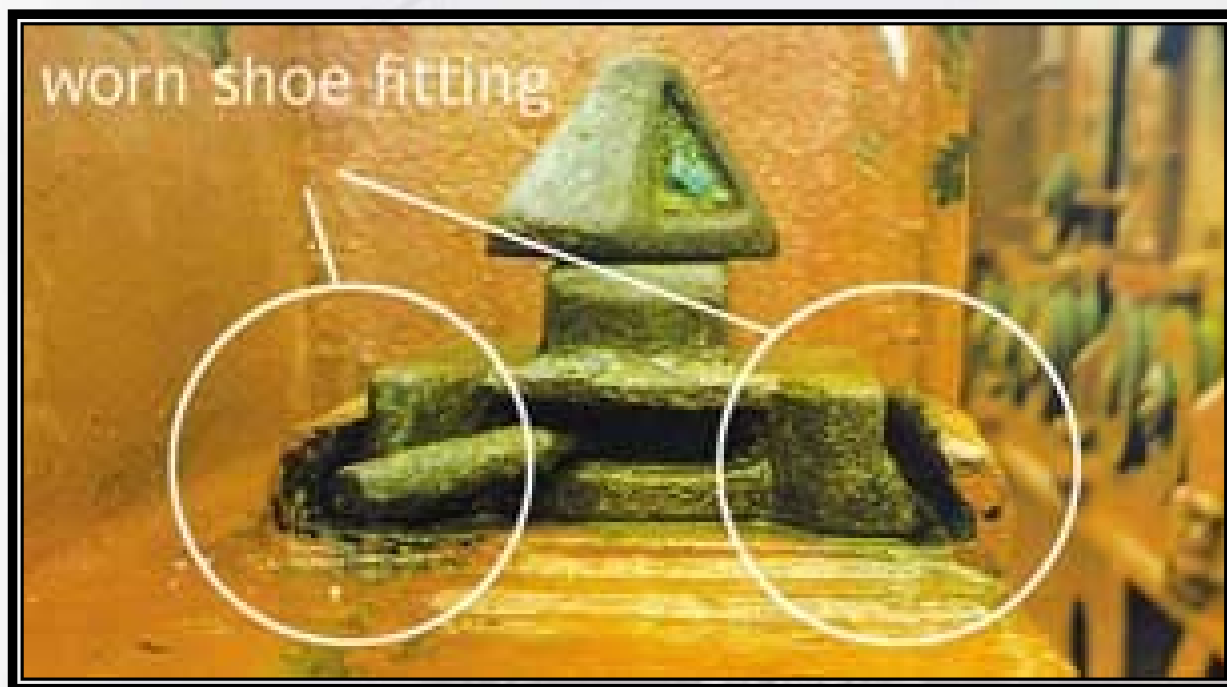


Think a bit about these in your own environment
what accidents are just waiting to happen in your



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HARDWARE - Inadequate due to quality of materials or construction,
non availability of hardware and failures due to ageing



“is the ships equipment working properly”



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DESIGN – Deficiencies in layout or design of ship, plant, equipment or tools which leads to misuse or an unsafe act.



“ is bad design encouraging unsafe acts”



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Water Ingress



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Back Injury/Head Injury



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MAINTENANCE MANAGEMENT - Failures in the system for ensuring technical Integrity of facilities, plant, equipment and tools

Inserts

Indentation

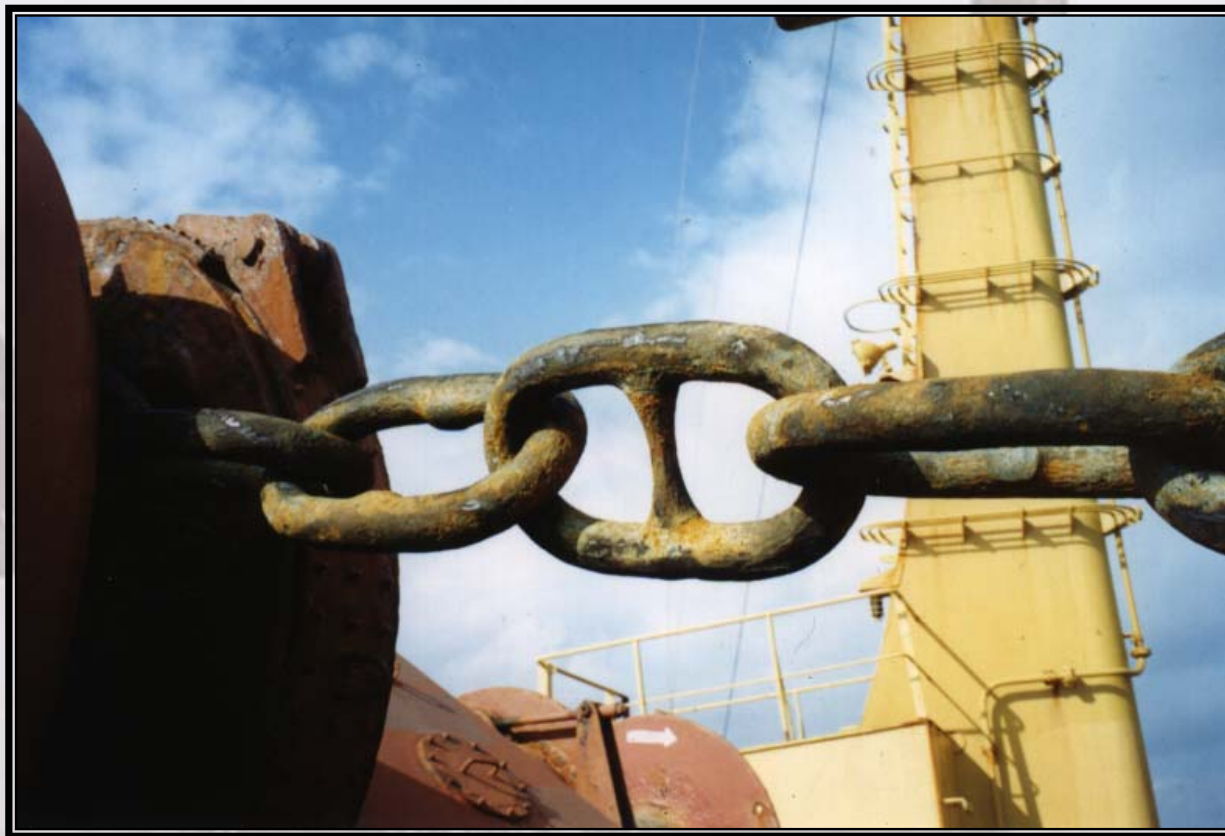


Structural damage

“are there proper maintenance systems in place”



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HOUSE KEEPING – Where resources for cleaning and waste removal are inadequate and dirt and disorder are tolerated



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House Keeping



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PROCEDURES – Where standardised task information is unclear, unavailable, incorrect or otherwise unusable.

(Procedures are there to establish a safe working practice)

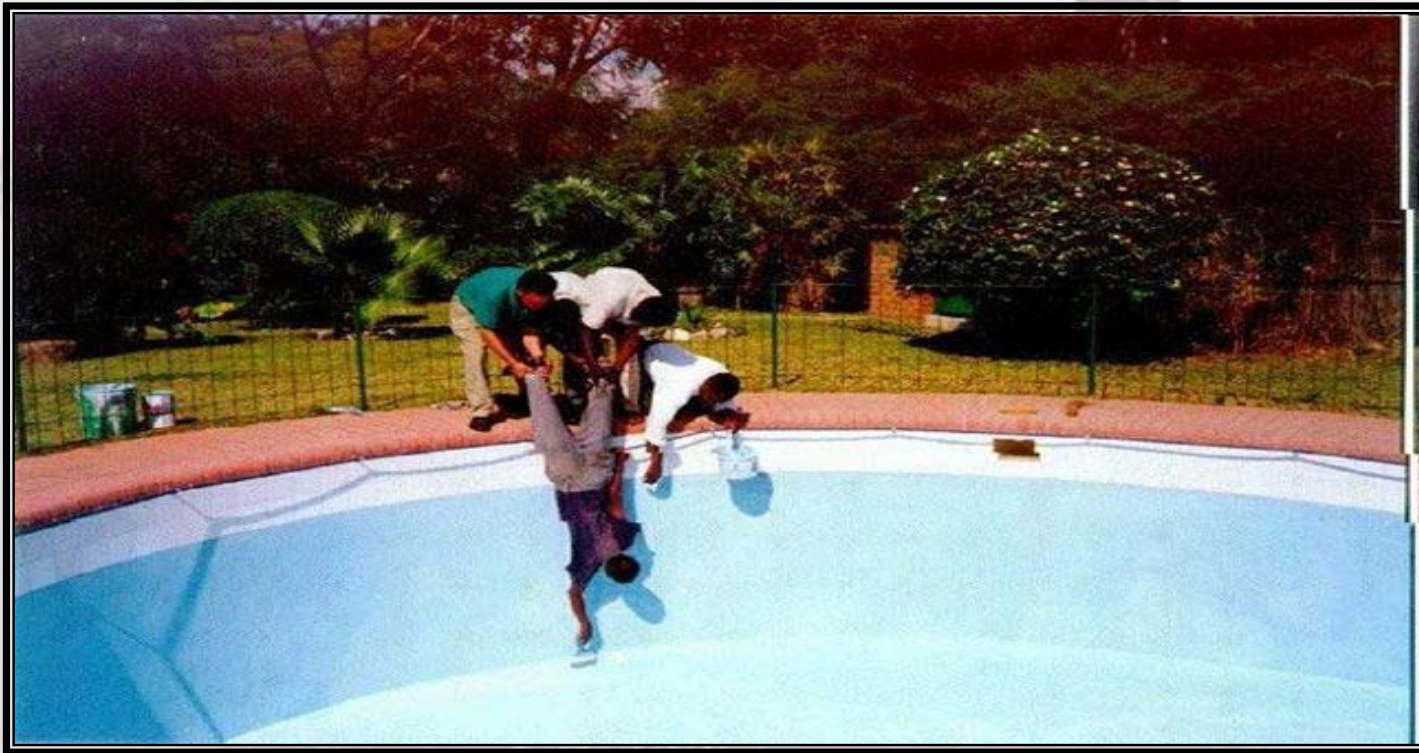


“ are standing orders on board clear,correct and available”



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ORGANISATION – Where the structure of a company, or the way it conducts its business, allows safety responsibilities to become ill defined and warning signs to be overlooked.



“ does the way a work group is organised, or the way it operates, allow warning signs to be overlooked”



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TRAINING – Where individuals are not provided with the awareness, knowledge or skill needed to perform their function in the organisation adequately.



“do people have the skills they need”



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INCOMPATIBLE GOALS – Where there is a failure to manage conflicts between, for example, the demands of productivity and safety, or written procedures and “the way we always do things”



“ conflicts between safety and productivity...
written procedures and informal rules ...
demands of the job and personal distractions”



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ERROR ENFORCING CONDITION – Where factors acting on the individual, or in the work place, promote unsafe acts

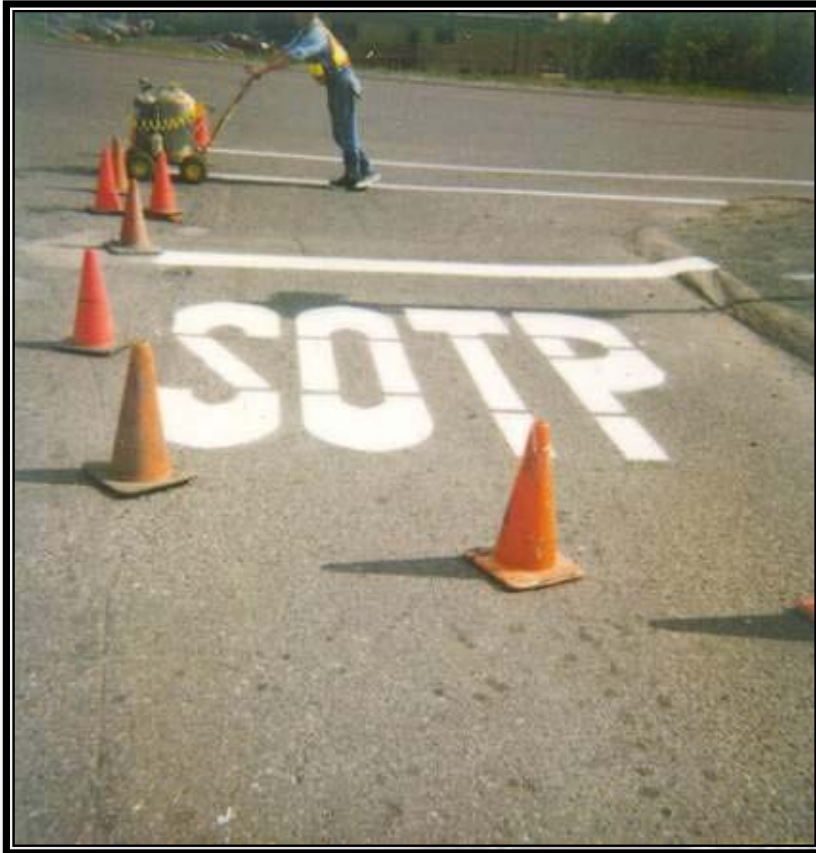


“ pressure of time...fatigue...too little/to much information...
poor working conditions..low morale”



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COMMUNICATIONS – Where information necessary for the safe and effective functioning of the organisation is not reliably exchanged



Visual

The spoken word



“ do channels of communication exist...
is the necessary information transmitted/received and on time...
is it understood”



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DEFENCES – Where there are inadequate systems, facilities and equipment to control, contain, or mitigate the consequences of human or component failures



“ the measures designed to control or contain hazards”



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These 11 areas are the Vital Organs of a human error incident

- Like the human body
 - Improve the health of the individual organs
 - Improves the health/strength of the whole
 - Reduces the potential for a weakness in the system



Basically we are saying that

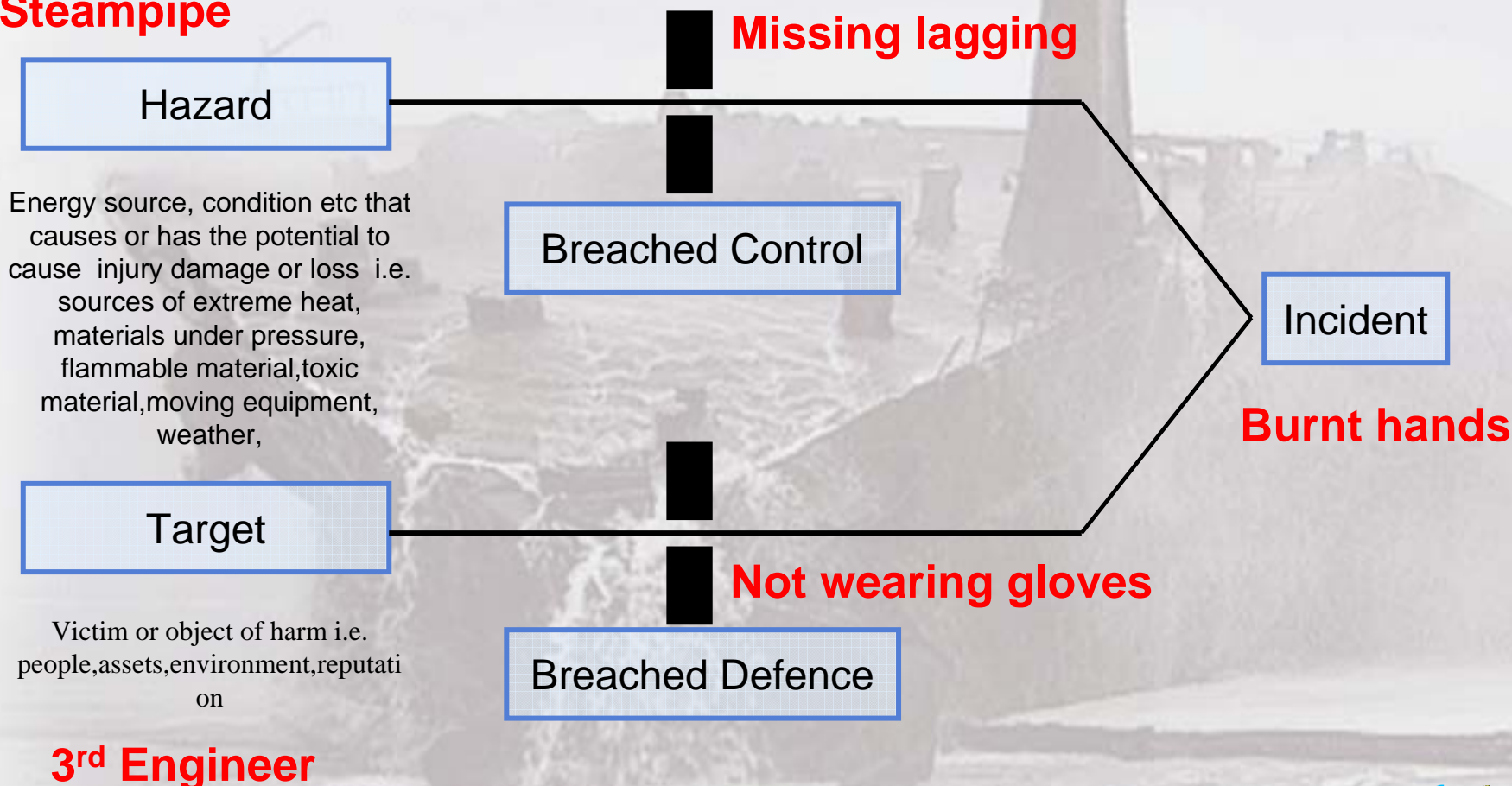
- **Latent Failure** is a system flaw which causes a **precondition** in which a possibly minor **active failure** is the final trigger to cause the incident



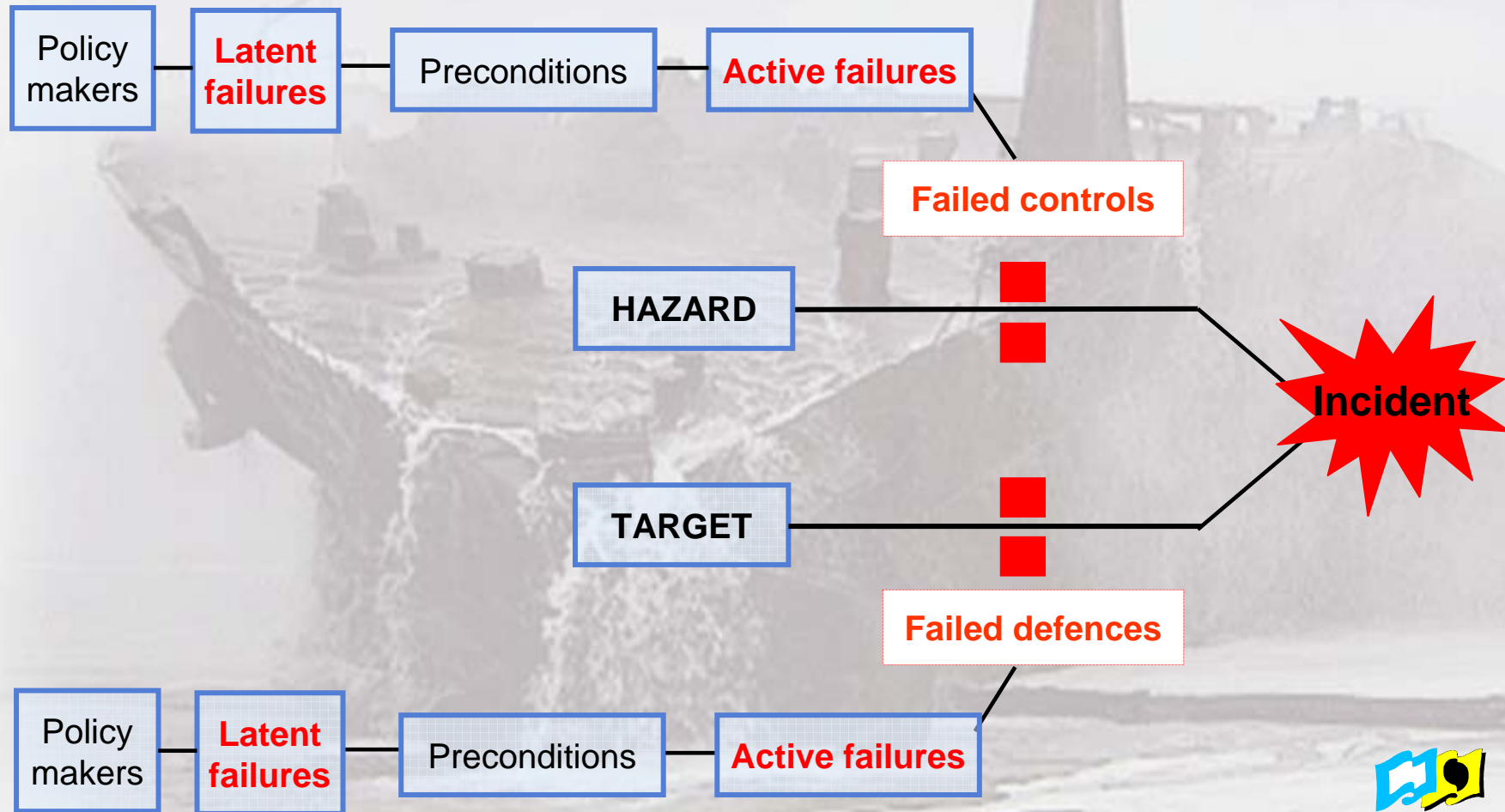
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Breach of an existing hazard controls/ target defences

Steampipe



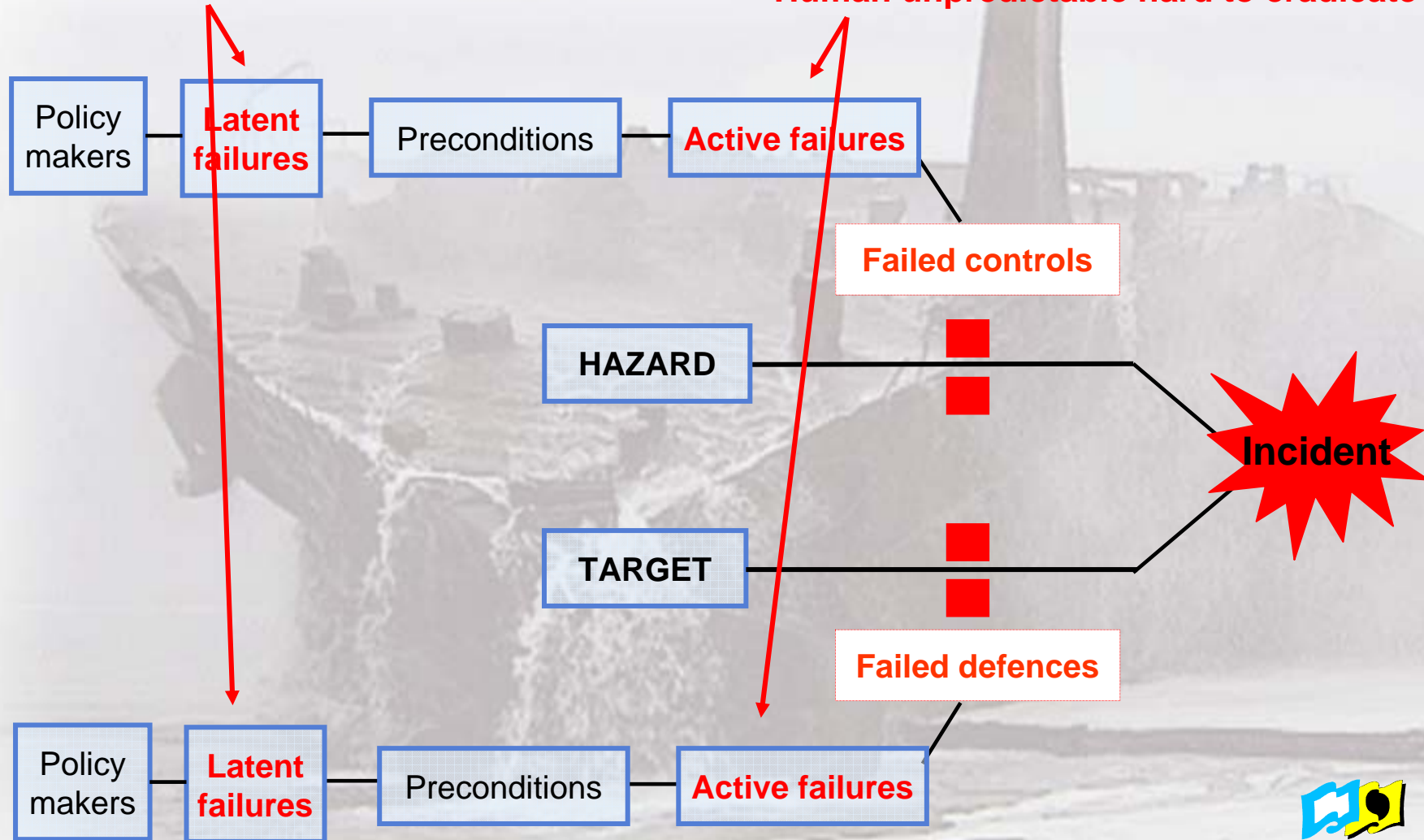
Incident tree



Incident tree

Hidden, continually present

Human unpredictable hard to eradicate



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Conclusion

- Focus on latent failures not active ones
- Focus on situations not people
- Think of errors as consequences, rather than causes
- Always aim to prevent the next error not the last one





“No Room For Error” The DVD



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“No Room For Error”

- Aim



Raise awareness (1st stage)

- Not just proximate cause
- Latent failures
- Chain of events



Highlight

- Key areas



Simplify

- A lot of good material already out



Complement

- Material to support owners existing initiatives



“No Room For Error”



- Video and DVD



- Designed for trainers
 - 6 Versions (DVD)
 - » 1 Full
 - » 5 Shorter risk specific
 - Split into sections
 - Support material



- 11 languages (subtitles)
 - English, Chinese, Croatian, Ukrainian, Russian, Spanish, Portuguese, Tagalog, Greek, Turkish, Korean



- HSE Consultant





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