Liberian Shipowners' Council Ltd

Safety Culture: Lessons Learned from the Tanker Industry

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Industry Study: Lessons Learned

- Inter-Industry Working Group: fatal fire & explosion incidents; chemical & product tankers
- Most incidents were **AVOIDABLE**
- Failure to follow **guidelines and procedures**
- Indications of a systemic failure of the safety management system

Industry Study: Lessons Learned

- Regulations are not a substitute for good management practice
- Compliance with acceptable industry procedures & guidelines was not considered essential
- Passive or inactive safety management enabled unsafe conditions to develop and proliferate
- Working safely did not appear to be a condition of employment
- **Safety culture** was in the **black hole**

Industry Study: Lessons Learned

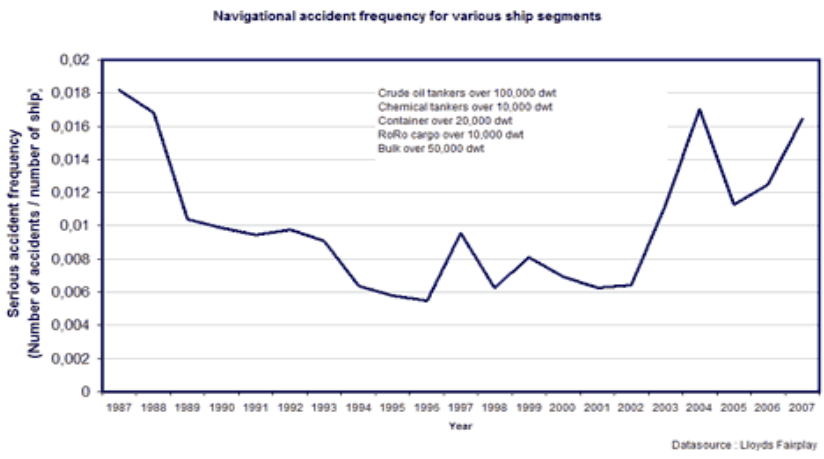
- Profound ignorance of the essential role of the **“human factor”** in effective safety management

The Safety Challenge in Shipping

- Marine transportation is a **high-risk** business conducted in a hostile and unforgiving environment.
- Cost of “human error” = +**$1,000,000/day** excluding criminal indictments etc.
- “Human error” responsible for 70 - 90% of all industrial accidents

How are we doing?

Navigation Accident Frequency 1987-2007: Lloyds Fairplay



The Safety Challenge in Shipping

Lloyd's List: 22 February 2008

- DNV statistics demonstrate that a ship is **twice as likely** to be involved in a **serious accident** today compared to only five years ago.
- AND, the **costs** of these accidents have **doubled**.

Complex Industries: Safety Challenge

Source: Advanced System Safety Management

Aviation, Health Care, Nuclear, Shipping

- Multi-discipline industry
- Irregular working hours 24/7 with no room for error
- Complex systems
- Fixed chain of command (open communication?)
- Staff are licensed or certified
- Communication can be a matter of life and death
- Initiative continuously challenged
- Success can be influenced by the performance of "others" (pilots, agents, suppliers, port authorities etc.)

Key Focus: Human Behavior

- Accidents are caused by normal people undertaking normal activities in abnormal circumstances.
- We have all made errors.
- We always have made errors.
- We always will make errors.
- Shipping professionals (onshore and onboard) are human and therefore prone to error

Key Focus: Human Behavior

- Human error can be **detected, reduced**, and **contained** but NOT eliminated
- We can not “engineer out” human error, but...
- We can design equipment and systems that will take human error into consideration

Key Focus: Human Behavior

Non-technical causes of human error include:

- Stress
- Imperfect information processing
- Fatigue
- Workload
- Poor decision making
- Cognitive overload
- Poor interpersonal communications

Training: Non-technical Skills

- Communication
- Team work
- Organization
- Management
- Problem solving

Threat and Error Management

Practical approach to **risk management**

It is based on:

- Understanding nature and extent of error
- Changing conditions that induce error
- Determining behaviors that prevent or mitigate error
- Training personnel

Threat and Error Management

- Errors are INTERNAL
- Threats are EXTERNAL
- Each must be managed in order to achieve a desired outcome.

Errors: Internal actions or inactions

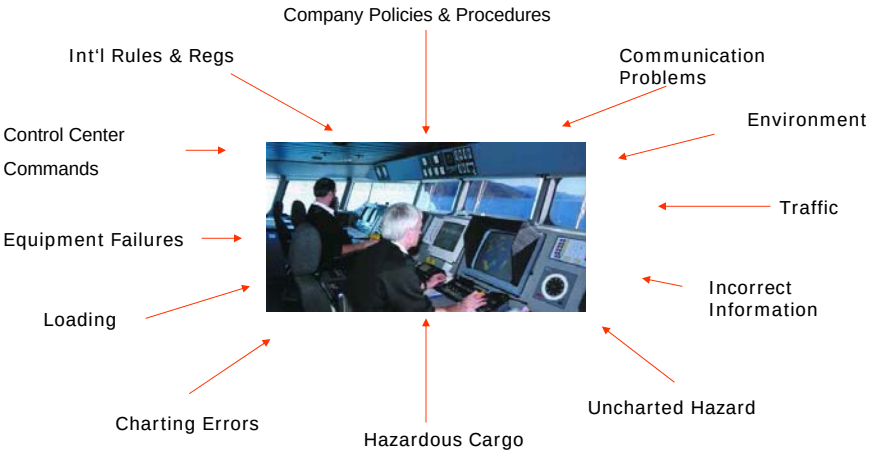
- **Violation errors -** deliberate failure to adhere to procedures or regulations
- **Procedural errors** - followed procedures but executed incorrectly
- **Proficiency errors** - error due to lack of knowledge or skill
- **Communication errors** - missing or wrong information exchange or misinterpretation
- **Decision making errors** - decision that unnecessarily increases risk

Threat: External action or inaction

- **Anticipated**: weather; port congestion
- **Unanticipated:** heavy traffic in shipping lanes; equipment malfunctions; engine failure; port officials, tug boats, line handlers
- **Latent:** *existing conditions* that may interact with ongoing activities to precipitate a problem; equipment design issues; fatigue

Threat & Error Management

Source: *Advanced System Safety Management*



Safety is good business

- Human error can be **managed** and **mitigated**
- Effective safety management improves efficiency, raises productivity and increases **profit potential**

Safety is good business

Advanced System Safety Management

- Safety Management = Risk Management
- Risk Control → Cost Control
- Cost Control → Efficiency
- Efficiency = Productivity
- Productivity = **PROFIT**

What next?

- Recognize that human error is the symptom, not the disease
- Design equipment, operations and systems that recognize the realities of human behavior
- Standardize equipment where possible
- Invest in effective training programs; include training for non-technical skills
- Where feasible, enable crews to operate as teams; encourage open communication
- Establish standard operating procedures & ensure compliance

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THANK YOU