Korean Seafarers’ Behavior Characteristics and Maritime Safety

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1. Importance of Maritime Safety

- Collision accident of Oil Tanker WUYISAN

✓ There were 4 Captains on the bridge but no one did object high approaching speed.
1. Importance of Maritime Safety

Capsizing accident of Car ferry SEWOL

✓ Shipowner did not obey loading requirement of ballast water because of overloading cargo.
1. Importance of Maritime Safety

Iceberg Theory of Safety Costs

- Direct cost (visible cost) is much less than indirect cost (invisible cost) in the marine casualties.
1. Importance of Maritime Safety

Total Estimate Cost of SEWOL Disaster

- Direct cost 937m USD
- Indirect cost 1.177b USD

Total 2b 114m USD

Total Estimate Earning of SEWOL

- Passenger fare 29,400 USD
- Cargo freight 68,600 USD

Total 98,000 USD

Source: MBN, 2014. 5. 3
1. Importance of Maritime Safety

- Influence Factor of Marine Accidents
  - Marine accident mainly occurs by combination of multiplicative causes, not single cause.
2. Human Error

- Occurrence Rates of Marine Accidents

**KMST**
- Operating Error, 82.1%
- Explosion, 75%
- Failure, 10.1%
- Others, 7.8%

**USCG**
- Allision, 75%
- Collision, 96%
- Tug, 79%
- Tanker, 100%
- 50%

**UK P&I**
- Human factor, 62%

- More than 80% of Marine Accidents caused by Human Error
2. Human Error

Occurrence Rates of Other Transportation Accidents

- Car: About 95%
- Airplane: About 75%
- Rail Train: About 80%

If we can control human error of operators, marine accident will be reduced dramatically.
2. Human Error

- Type of Human Error

![Diagram of types of human error]

- **Unsafe Acts**
  - Unintended Action
    - Slip
      - Attentional Failures
    - Lapse
      - Memory Failures
    - Mistake
      - Rule based, Knowledge based Mistakes
  - Intended Action
    - Violation
      - Routine Violations
      - Exceptional violations
      - Sabotage
Tendency of Marine Accident Causes

- Marine accident caused by mechanical failure will be reduced because of technical development.

- On the other hand, accident by human error will increase relatively.

- Especially human error caused by a cultural gap in the multi-nationality vessel will increase remarkably.
More than 21,000 foreign seafarers (about half of Korean seafarers in number) work on Korean vessels.
2. Human Error

- It is impossible to contain Human Error,

- But I'm possible to reduce Human Error!
3. BRM, Tool for Mitigate Human Error

- Customs Formation

  Motive ➔ Behavior ➔ Maintain
Cockpit Resource Management Course

- Cockpit Resource Management (CRM) is a set of training procedures for use in environments where human error can have devastating effects.
- CRM training for airline crews started on June 1979 by recommendation of NTSB.

3. BRM, Tool for Mitigate Human Error
3. BRM, Tool for Mitigate Human Error

- Error Troika of 5th Generation CRM Course
3. BRM, Tool for Mitigate Human Error

- Bridge Resource Management in Shipping

  ✓ BRM was introduced as recommend course in 95 STCW Amendment.
  ✓ BRM/ERM courses were made compulsory in 2010 Manila Amendment.

<table>
<thead>
<tr>
<th>Part</th>
<th>Amended Competence</th>
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<tbody>
<tr>
<td>Deck Officer</td>
<td>• BRM • VTS • Position reporting • Distress signal/Morse signal</td>
</tr>
<tr>
<td>Engineer Officer</td>
<td>• ERM • Ballast water • Pollution prevention • Oil-water separator • Fuel/Lubricating oil</td>
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✓ Every ship officers need to undergo BRM/ERM courses until the end of 2016.
3. BRM, Tool for Mitigate Human Error

The Differences between BRM and other Training

**General Education and Training**

- Contents of SOP
- Method of commission
- New behavior style
- Communication method

**BRM/ERM Training**

**Skill Acquisition**

- Attitude of comply SOP
- Attitude of entrust task
- Attitude of changing behavior style
- Attitude of correct communication
- Keeping common sense each other

**Changing Attitude**
3. BRM, Tool for Mitigate Human Error

- Distance Learning Composition

  - Ship
  - Learning Environment
  - Resources
  - Design
  - Interaction
  - Communication
  - STCW 2010 Amendment
  - e-Navigation
  - How?
4. Application of Behavior Characteristics

- Process of Changing Culture

Risk Society

Cultural

Custom

Behavior

Thinking

Safe Society
4. Application of Behavior Characteristics

Behavior Characteristics of Korean Ship Officers

1. Affection to others 3.96
2. Strict hierarchy 3.72
3. Strong feel sense of belonging to their group 3.62
4. Decent appearance/cloths 3.54
5. Suppress one’s emotions and desire 3.51
6. Keep one’s past lifestyle 3.47
7. High fervor for education 3.37
8. High bravery 3.36
9. Cordial reception to others 3.35
10. More justification than benefit 3.05
11. Lack of sociality 3.01

Affected by Confucianism
Without Confucianism
4. Application of Behavior Characteristics

- Implication of Characteristics of Korean Seafarers

✓ Korean seafarers’ society is still affected by Confucianism’s culture strongly.

✓ Korean seafarers’ behavior characteristics are little different in title, gender and age.

✓ But there are significant different in ship type and educational background.
  - large difference between fishing vessels and merchant ships and between high school and University graduates.
4. Application of Behavior Characteristics

Means of Attitude Change to Improve Safety

1. Remind keeping safety before work
2. Feel responsible for safety
3. Praise or proud one
4. Education and training
5. Post safety rule
6. Prevent unsafe behavior
7. Pre-notice consequence of violation
8. Emphasis seafarers’ social obligation
9. Announce one’s action to others
10. Furnish violation
11. Pay monetary allowance
12. Act unsafe behavior intentionally
13. Inflict physical corporal to violator
14. Feel suffering fears to violator

- Positive reinforcement
- Negative reinforcement

Median value

- 1. Remind keeping safety before work: 4.35
- 2. Feel responsible for safety: 4.34
- 3. Praise or proud one: 4.28
- 4. Education and training: 4.22
- 5. Post safety rule: 4.21
- 6. Prevent unsafe behavior: 4.15
- 7. Pre-notice consequence of violation: 3.90
- 8. Emphasis seafarers’ social obligation: 3.76
- 9. Announce one’s action to others: 3.45
- 10. Furnish violation: 2.97
- 11. Pay monetary allowance: 2.93
- 12. Act unsafe behavior intentionally: 2.39
- 13. Inflict physical corporal to violator: 2.29
- 14. Feel suffering fears to violator: 2.18
Implication of Attitude Change of Korean Seafarers

- There are no perceptational difference between group of title, gender, ship type and educational background.

- But there are large perceptational difference between age group relatively.
  - Middle age group(30s) needs more attitude change than other age groups.

- Means of attitude change to improve safety affect nearly same effect for Korean seafarers.
4. Application of Behavior Characteristics

- Affection Oriented Ship Management

  - Affection is a typical characteristic of Korean people and same to Korean seafarers.

  - Humane problem solving strategy by understanding and work improvement is more effective than furnish or physical corporal to violator.
4. Application of Behavior Characteristics

- Enhance Sense of Order and Cooperation
  - Korean seafarers’ society makes much more a hierarchic relationship and belongings.
  - The legitimate ship management is necessary based on the Confucianism.
4. Application of Behavior Characteristics

Raising an Awareness

- To improve safety culture in Korean seafarers’ society, it is necessary to change passive mind to active one for safety.

- New education system, like BRM/ERM and e-learning will help Korean seafarers’ shipboard life.

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<th>Means for Safety</th>
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<td>Keep one’s past lifestyle</td>
<td>Strengthen responsibility</td>
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<tr>
<td>High passion for education</td>
<td>Safety education and training</td>
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<tr>
<td>Lack of flexibility</td>
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Thank You!