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The Japan Ship Owners' Mutual Protection & Indemnity Association Loss Prevention and Ship Inspection Department

A Psychological Approach to Safety Behaviour Continued...



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§ 1 Introduction

On this occasion, we have summarized our autumn Loss Prevention internal seminars which were held in Japan (13 locations in total) from September 2019. Although the titles of each seminar held in Hakodate and Kure are different from the other seminars, the same seminars will be held in spring 2020 accordingly.

Almost 90% of all maritime accidents are said to be caused by human error. Theoretically speaking, if we eradicate human errors, we should be able to cut the number of maritime accidents by 90%. However, it will not be possible to achieve this owing to the 12 human characteristics that come into play. (Please see our Loss Prevention Bulletin No.35 "Thinking Safety" issued in July, 2015 for details.)

Unlike traffic accidents, casualties at sea are seldom caused by one single human error. Rather, casualties occur following a chain of human errors. Therefore, with BRM • BTM (Bridge Resource Management • Bridge Team Management), maritime accidents are being prevented by breaking such error chains, even when a human error has already occurred.

In our spring domestic seminar 2019, our guest lecturer Mr.Nobutoshi Tsutsui (hereinafter the lecturer) delivered a presentation entitled "A Psychological Approach to Safety Behaviour". There has been a great deal of demand for future lectures to be conducted. (In autumn of the same year, at some locations where the lecturer's schedule would not permit, Capt. Okada of the Loss Prevention Department filled in for the lecturer.)

Although it is not possible to eliminate human errors, we consider that having an understanding of the underlying human psychological factors and characteristics may be an effective way to reduce human errors. As a result, we then launched our seminars in 2019 with a focus on psychology. We hope that this will facilitate the reduction of accidents at sea.

Please also refer to the Loss Prevention Bulletin No.46 "Psychological Approach to Safety Behaviour" which is the original edition.

QUIZ

Here is a Pop quiz. How do each of the pictures below appear to you? Note down what comes to mind. This is explained later in this guide.

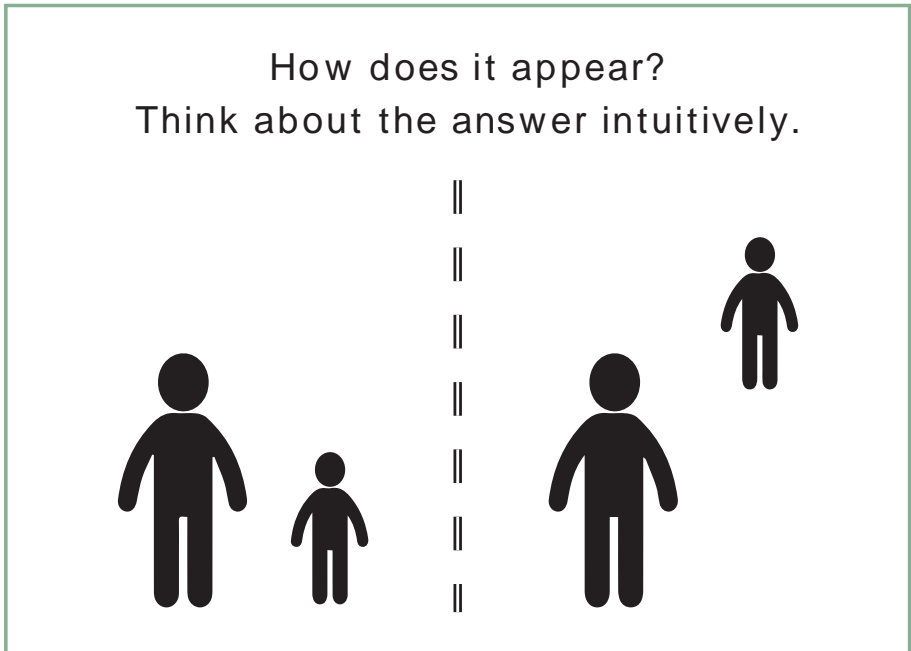
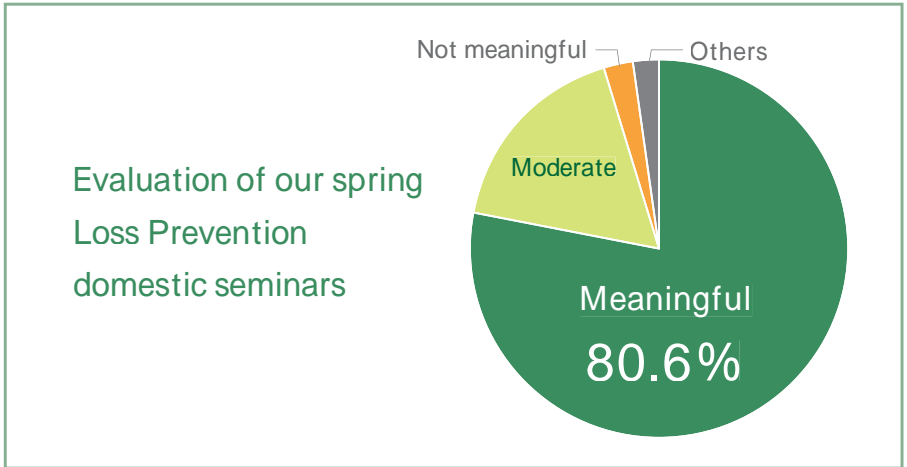


Fig. 1 How does it appear?

§ 2 How to obtain SOC (Sense of Coherence) to avoid hurting one another



Graph 2

As shown in Graph 2, according to the questionnaire results regarding our domestic spring seminar in 2019 titled “A Psychological Approach to Safety Behaviour”, 80.6% of the total audience thought it was meaningful; and we are happy to hear that it was so well received.

After the ISM Code became mandatory for ocean-going ships in the 1990s and the safety management code also became mandatory for coastal vessels in 2006, the number of casualties has dramatically declined.

Lately, however, the rate of casualties has declined gradually. It will be necessary to reduce the occurrence of human error if we are to further prevent accidents.

We believe that it should be possible to reduce the occurrence of human error, as long as we understand the patterns of psychological reactions and behaviours which may cause human errors.

2 - 1 Why has Psychology attracted a great deal of attention from the maritime industry?

Psychology as a new academic field started 140 years ago, and sought to clarify the principles behind human psychological behaviour using scientific methods. This study aims to grasp the universal psychological mechanisms which everybody has. In human behaviours, common patterns can be found with a certain amount of probability.

A common pattern in behaviors can be referred to as a "principle" or a "law" in the field of Psychology. For example, in regard to the question "Which ramen restaurant do you think offers the most delicious noodles, a busy and crowded ramen shop or an unoccupied one?", almost all people will answer "A busy and crowded one." This case we can observe a psychological phenomenon called the "Band Wagon Effect" due to peer pressure.

At the seminar in the Shikoku region, there was a comment from one of the participants who said, "In our region, this may well apply to an udon restaurant, but ramen restaurants are never crowded so we do not have to choose between one or the other." The lecturer understood the differences between regions and their characteristics during the seminars.



Photograph 3: Band wagon

*** Band wagon effect (From Wikipedia)**

This can be defined as an effect that can further increase the phenomenon whereby the majority of people have a tendency to select one choice over another. A "band wagon" is usually a large and ornately decorated carriage, designed to carry a musical band that plays at the front of a line. To "jump on the band wagon" means to join a growing movement in support of someone or something, favour the majority or ride the winning horse.

Regarding psychological experiments involving humans, as it will be difficult to match all conditions to everyone being tested, the following have been observed.

Identical twins who do not live under one roof, but who grew up under ideal living conditions are the best subjects. However, the results of an experiment would not be exactly the same due to the “difference” in their living environments.

Even for the same person, the result can be skewed over time, because the subject learns and experiences something new every day.

In other words, it is said that place of birth, religion, family structure, educational environment, living environment, etc. greatly influence such psychological experiments, and that the same result cannot always be duplicated at 100% probability. Perhaps it is because of this that the study of psychology may be considered “something suspicious” to maritime clusters.

Firstly, let’s take a closer look at those who make up maritime clusters.

It seems that those who specialized in the social sciences such as faculties of economics or business administration, who now belong to a finance department or sales and marketing division, cannot easily dispel the delusion that human beings make rational and correct choices. This issue has been studied in the fields of economic behaviour psychology and behavioural economics. Richard H. Thaler who won the Nobel Prize in Economics suggests that “conventional economics assumes that people are highly-rational—super-rational—and unemotional. They can calculate like a computer have no self-control problems.” It is obvious that such a person does not exist, and that most financial choices are always related to psychology.

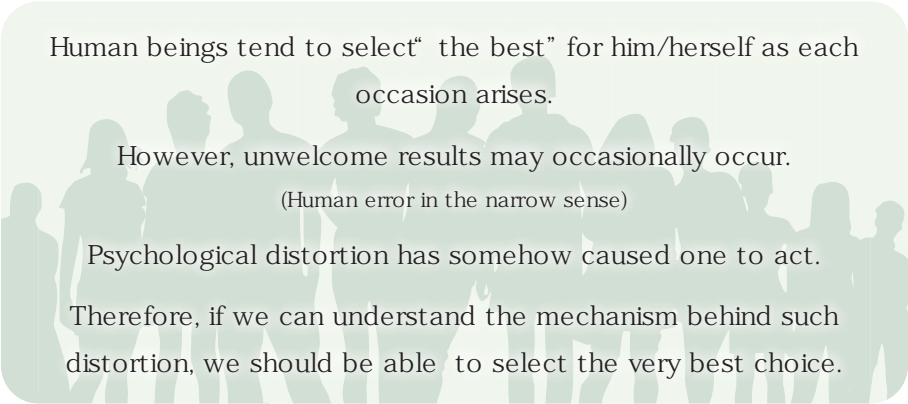
Also, those who specialized in insurance or who studied at the faculty of law now belong to the department of general affairs, legal affairs or the human resources department are sort of word magicians. They pursue meaning behind behaviour and size things up using colourful vocabulary, then they take control, manage, dispute and so on, all done in a seemingly analogue way. They are, however, in fact living in a world of digital electronics and reason whereby issues are determined by a yes-or-no binary system.

In addition, those who specialized in the field of science and engineering now belong to naval architecture such as the marine department, technical department and the seafarers' department or are engaged as engineers or crew living in a world of digital electronics and reason, citizens in the world with the belief that science comes first. They have ensured safety with a purely technical approach. Crew members, especially, those who specialise in integrated science and feel the need for teamwork and downward communication, respect a vertical society.

The above mentioned analysis shows that almost all members belonging to maritime clusters have a specific character : they do not accept something if it is not 100% certain.

Is it not because of these factors that we are in something of a stalemate when it comes to safety measures?

The lecturer considers the below to be true of human nature:



Human beings tend to select " the best " for him/herself as each occasion arises.

However, unwelcome results may occasionally occur.

(Human error in the narrow sense)

Psychological distortion has somehow caused one to act.

Therefore, if we can understand the mechanism behind such distortion, we should be able to select the very best choice.

Also, the lecturer believes that the following elements which facilitate / inhibit safety are related to one another.

DENSITY Your area and the number of constituent factors

SPEED Speed at which one moves and the constituent factors

TIME Ampleness, own behavioural constraint, working hours timeframe and seasons

BODY Diet, physiological phenomenon, health, arousal and consciousness

ENVIRONMENTAL Light/darkness, cold/warm, disturbance, high/low, noise/silence and likes/dislikes

CONTROL Supervision, award, punishment. Degree of containment, (strictness or self-initiative) and education level

HOUSEHOLD AND SOCIETY Stableness, degrees of satisfaction for physiological needs and safety needs

EXPERIENCE Frequency and degree of success/failure, as well as depth of learning

ATTITUDE Activeness to response to something that is difficult, sense of responsibility, and level of impulsivity

OUTCOME PREDICTION Awareness of appearance/disappearance of reinforcer/punisher gained from learning or experience

The lecturer was thinking that some kind of new device “Behaviour Selection Aid” would be useful in ensuring that safety measures significantly eliminate failures caused by human beings. This device would analyse the connections between various elements using AI. Then, for example, images showing environmental measurements etc., danger alerts, a manual of procedures, and information about psychological bias etc. along with instructions would be shown on a heads-up display in a pair of eyeware, with bone-conducting headphones for sound. And then, such a device could record videos of work being carried out while converting data in real-time to provide the wearer essential information safe practices.

Just while the lecturer was preparing papers for these seminars, he discovered the very same idea in a graphic novel where the main character was the master of a sniper.


2 - 2 How to develop SOC (Sense of Coherence) to avoid hurting one another

From Kawai, Kaoru (2019). Tanin no ashi wo hipparu otokotachi (Office workers who are causing trouble for other people: Provisional translation)

Since the bursting of the bubble in Japan, it seems that the following aspects are inextricably linked together as features of modern-day workplaces and society. According to the book written by Kaoru Kawai (hereinafter author), it is pointed out that intolerance towards others has been increasing every year and she feels that this era is strangely suffocating.

Positive		Negative
"Likes" Go viral	↔	Come under fire
Coaching and education	↔	Bullying and physical punishment
Collaboration and cooperation	↔	Competition and evaluation
Freedom and creativity	↔	Managed and superficial
Diversified opinions	↔	Rejection of minority's thoughts
Motivational	↔	"grumpy old man/men" who don't care who they step on

In order to get through this age, the author emphasizes the importance of enhancing "SOC" which is something that is based on people trusting themselves and their surroundings (their world). "SOC" can be said to consist of the following senses/beliefs.



S O C

The sense of understanding that life makes sense in the world where we are living.

The belief that life is not so bad, even though things don't always go as planned.

The belief that it will all work itself out in the end.

The belief that one will never be a negative thinker.

It is said that Japanese in the past had high “SOC”. The author points out that the one contributing factor to this was “job security”. Specifically, companies played a significant role in the foundations of the Japanese welfare society such as lifetime employment and promotion by seniority. Also, the author explains that these companies commanded the world-class high watermark of “Made in Japan”. It was this sense of pride that gave people the shared spirit that “we were all participating”.

Lifetime (lifelong) employment:
lifetime security for tomorrow promised today

Seniority system:
a social norm whereby one can survive as long as effort is made
diligently

2 - 3 How “ grumpy old man/men ” come to be

Recently, the number of people who tend to think that “It would be easier not to care about others and to step on them rather than strive in vain” has been becoming more prominent in organizations. In addition, it seems that the number of the people who behave in an autocratic manner have increased; some blame their junior staff, co-workers and clients too much. One such example was when a customer in a convenience store reprimanded a shop assistant for giving the incorrect change mistakenly. The assistant was taken outside and made to kneel down and bow until his forehead touched the floor in apology. What is even worse is that these scenes of domineering behaviour are recorded and disseminated over the internet.

How has this kind of tyrannous person come to be? The author points out that a large contributing factor for this can be attributed to the social circumstances of recent years.

Collapse of the traditional Japanese welfare society

After the burst of the economic bubble, the following characteristics that contributed to Japan's welfare society have been collapsing.

- En masse recruiting of new graduates

- Supportive in-house training system

- The age-based remuneration system

- Benefits package

- The typical managers in Showa-era who treated their employees as if they were family

Once staff that are not counted as human resources but rather an operating cost

The author made the point that a worker's dignity has become undervalued and that manpower is simply regarded as an expenditure.

- Corporate downsizing in order to protect the company

- Results-oriented value for pay reduction

- Non-regular workers with low wages who can be "managed" easier

- "Utilization" of temping services and overseas workers

For some years, it has been fashionable to use a certain word expressed in katakana. In around 2001, the lecturer experienced an impressive occurrence: The Ministry of Land, Infrastructure, Transport and Tourism used the term "Human Infrastructure" to describe seafarers. To be honest, the lecturer thought it was something cool at that time. However, in hindsight, that expression bears an uncomfortable feeling as they treat the crew members as objects or facilities.

Rewards have decreased and replaced moral tone simply to encourage competition

The notion of a stickler for compliance also reflects the suffocating era.

As a result of this, **“grumpy old man/men”** who don’t care who they step on appeared.

Who are the “grumpy old man/men”?

Symbolic word for exercising his/her “power” only to “protect him/herself”.

This is not limited to a certain generation or males only. “grumpy old man/men” can be found among the younger generations and women.

Such people are forming an intolerant workplace and society which cannot accept diversity.

Also, this brought about the word **“top down management”**, those who only recognize their superiors.



Fig.4 Top down management

2 - 4 “ Grumpy old man/men ” as barriers which decay the organization

The existence/being of “grumpy old man/men” barrier takes the organization into their own hands and corrupts it. In other words, it will be essential to banish the “grumpy old man/men” barrier for an organization to operate soundly. For example, when there were a variety of big scandals committed by grand old men in 2018, the author points out that the influence of the “grumpy old man/men” barrier was existent. (Former head coach of a certain university’s American football team, Japan Amateur Boxing Federation President etc.)

Waning productivity

They tend to wait for the “ enemy ” to make a mistake without acting positively by themselves.

They tend to develop aggressive behaviour, only towards their junior sta (the weak) when he/she makes a minor mistake.

Company atmosphere degenerates

They are fascinated with power (their bosses), and they dare to cut connections with their subordinates and clients.

There is a high rate of turnover

These “ grumpy old man/men ” affect other employees' motivation and the rate of turnover increases in order to escape from them.

“ Grumpy old man/men ” vested with power

“ Big grumpy old man/men ” in management do not recognize the existence of “ tiny grumpy old man/men ” in an organization of top down management. Because such apple polishing “ tiny grumpy old man/men ” are obedient to “ big grumpy old man/men ”, they are seen and not heard. “ Big grumpy old man/men ” do not understand how this weakens an organization.

2 - 5 How to not become an “ grumpy old man/men ” or fall victim to “ grumpy old man/men ”

The key is to strengthen self-nurturing and enhance your willpower. It is always crucial to have a firm grasp of “what you want to be” or “how to live your life”. The author describes the internal qualities of Sense of Coherence as follows:

Self-acceptance

This is when you accept yourself in a positive way.

Independence

This is when one can make decisions autonomously about their actions and attitude.

Cultivating your personality

This is when one can believe in one's own possibility.

Life purpose

This is your clear understanding about how you want to live your life.

Environmental control

This is to ensure that one can survive in any environment.

Positive relationships with other people

This is when one has built a warm and trustworthy relationship, especially networking with those other than the people one may work with; which is important.

2 - 6 Principle and practice of LOVE

The author introduces the principles of LOVE in order to develop a Sense of Coherence (SOC).

L	Listen	: Not to hear (pretend to listen), but to lend a sympathetic ear, by imaging the other person's situation.
O	Over Look	: Closely observe the whole picture.
V	Voice	: Speak out to others proactively.
E	Excuse	: Not to permit or approve but rather forgive and accept.
	Enjoy	: It is also necessary to enjoy yourself.

The lecturer believes that for “**O** Over Look” it is necessary to ask oneself the following 3 questions before making a decision or taking action, by looking at oneself with a clearer perspective.

1. **What** are you doing?
2. **Why** are you doing it?
3. **What is to be gained** from doing it?

Coupled with the following two questions, we can expect a desirable outcome.

Is one's choice tightly connected with **one's position**?

Was it influenced by **one's emotion**?

This is defined as metacognition in psychology. It is the recognition of cognitive activity such as thinking, understanding and judgement from the viewpoint of a higher perspective (meta). Imagining that one's boss or coach is beside one, one will be able to see oneself and things more objectively.

The author introduces techniques on how to practice the principles of LOVE.

LOVE in practice

Learn to grin and bear it when “greeting”

You may see others who do not reply to you, and it could be that you may not like or are actually not keen on getting along with them at work.

However, it is recommendable to greet people and show gratitude proactively, trying to learn to grin and bear it. Because such an attempt helps to improve your communication skills with such kinds of people.

Among younger personnel, there is a scandalmonger type “grumpy old man/men” who is an expert of “character assassination” when it comes to his superior who he does not favour; for example, he intentionally blames and calls his senior boss and co-workers names, saying “my boss cannot use even do table calculations in Excel”.

The lecturer once had a subordinate who was terribly good at this “character assassination” and the lecturer could not be emotionally involved with him at all. However, just for team-building purposes, the lecturer decided to repeatedly greet and show him gratitude. He had no reaction at first, but after six months, the subordinate began to greet the lecturer back. And then, the atmosphere at the office improved, something that was a successful experience for the lecturer. Continuously greeting someone to elicit a favourable reaction is called “mere exposure effect” in psychology.

LOVE in practice

Speaking out

There was a new president of a leading company who was able to successfully outshine a number of his rivals. When the author asked this president why it was that he was promoted so dramatically, he explained as follows:

“ When I was a junior member of staff, I always observed our president. The president took every opportunity to tell employees “You are all respected members of society.” He, in fact, made a point of not referring to his staff using diminutive suffixes (-kun or -chan) he rather referred to them using a more equal suffix (-san). The president would

often look around the office and proactively spoke out to both the younger and middle-ranking personnel. Closely mirroring my president's attitude, I worked hard with the same determination to be responsible.

I always just practised what he did and found myself in the position that I am now, thankfully ”.

Psychologically, the former president 's attitude is true to “ Satisfying love/belonging needs ” (For details, please see P.74 of our Bulletin No.46 ”).

LOVE in practice

Let's be an office mum

In any office, there is a member of staff who is not too serious about efficiency, yet who is bright and reliable with competent skills. In addition, this person can communicate with others regardless of their position equally, without treating them differently because of their position.

This notion is not only applicable to middle-aged women but men and even younger people. This truly is the antonym of “grumpy old man/men”.

If such recent intolerant working places were to be compared to a machine, the lecturer considers, and not enough oil is applied, friction will build up between the parts, and such parts will overheat unnecessarily and become contorted.

This “office mum” can be compared to “highly effective lubrication” in the office.

LOVE in practice

Never stop thinking

There was an experiment known as “Obedience to Authority” during the post handling of World War II.

Adolf Otto Eichmann, Commander of the SS was responsible for the Auschwitz concentration camp.

After the war, he was arrested while on the run and then held for trial, at which it was revealed that he was a homely and kind person really. Then, there was an experiment conducted at Yale University US, in order to find out how such a kind person could be capable of carrying out such a cruel act of mass extermination.

As a result, it turned out that he was involuntarily obedient to orders.

This means that when human beings stop thinking rationally, they even commit atrocities.

Thus, it is important not to stop thinking rationally, in order to not bring one's life to ruin.

Our brains are programmed to save energy. In other words, we can say that the human brain is "a very inefficient organ" because it occupies only 2% body weight, yet consumes 20% of all energy. Therefore, we must accept the fact that we must not stop thinking and challenge our brains.

(For details, please see P.37 of our Bulletin No.46)

In the future, the lecturer **thinks that enhanced critical thinking skills (疑術力) will be required over an exclusive devotion to technical skills (技術力).**

§ 3 JR Fukuchiyama Line Derailment

(Source: Japan Transport Safety Board Report)

Before examining the marine accident from a psychological perspective, we need to take a closer look at the derailment accident that occurred on the JR West Japan Fukuchiyama Line on 25 April 2005.

3 - 1 Accident summary

At around 9:18 a.m. on the 25th of April 2005, on a right curve section between Tsukaguchi Station and Amagasaki Station in Kukuchi, Amagasaki City, Hyogo Prefecture, on the Takarazuka JR Tozai Line and the Katamachi Line (Gakken Toshi Line), a rapid train headed for Doshisha Mae Station derailed. The front five cars of the seven-car train careered off the tracks. The front four cars derailed completely, two of which ploughed into a apartment building by the tracks. The first car rammed into the piloti (parking lot) of the apartment building and the second car collided into the external wall of the building becoming almost completely compacted by the third and fourth cars. Impaled in the wall, the first and second cars were wrecked beyond



Photograph 5 Fukuchiyama Line Derailment 1 (From Wikipedia)



Photograph 6 Fukuchiyama Line Derailment 2 (From Wikipedia)

recognition. The third and fourth cars completely blocked the oncoming tracks. Of those involved in the accident, 107 perished (including the driver) and 562 were injured, making it one of the most catastrophic transportation accidents in history.

3 - 2 Problems with JR West Japan's management practices

JR West Japan's management practices are at the centre of the incident.

The company had become exposed to intense competition from other Kansai private railway companies such as Hankyu Railway since the JNR era. Due to such influence, it was said that there had been a strong sense of opposition from private railway companies competing with JR West after JNR was privatized. Aware of the need to overcome growing competition from private railway companies, the company saw fit to increase the speed of its trains in order to shorten commuting times and increased the number of trains operating, which is what is believed to have led to them favouring a speedy service and profits over safety.

It was also pointed out that at JR West Japan, because of fierce competition (as mentioned above), on long routes, employees faced an excessive rush of complaints from passengers when timetables got disrupted.

It was pointed out that contributing factors behind the slow progress of safety documentation was down to the fact that the company, since the privatization of JNR, was running many lines in the red, coupled with growing competition from private operators. Add to this the fact that some facilities were completely or partially destroyed by the Great Hanshin-Awaji Earthquake, and concrete collapsing in a shinkansen tunnel (Sanyo Shinkansen) which led to ever increasing expenses.

3 - 3 Problems with the timetables

The Fukuchiyama Line, on which the accident occurred, competes with the Takarazuka Line, Kobe Line, and Itami Line of the Hankyu Corporation, and aims to operate trains on a second-by-second, in line with other competing lines.

At a speed of 120km/h and a stopping time of 15 seconds, the train was operating on a timetable that was already not realistic, with the same amount of time being needed despite the addition of stations to be stopped at one after another. In December 2003, because it was operating on the same timetable as before, stopping at Chuzanji Station, any spare time needed to be cut in order for the train to run according to the same amount time required before. For this reason, there was a chronic delay occurring. In particular, at the point between Tsukaguchi Station and Amagasaki Station, the timetable for the fastest train according to the standard running timetable had been reduced even more when it was adjusted in October 2004.

At that time JR West announced that as a company policy they were to do away with any extra time.

When the Accident Investigation Committee examined the schedules of JR and private and public railway companies nationwide, it was only JR West that had a timetable with no time buffer.

3 - 4 Problems with Nikkin Kyōiku ("Dayshift Education")

Referred to as *Nikkin Kyōiku*, it consisted mainly of punishment.

If an employee was unable to meet the goals set by the company, they were "re-educated"; however this did not involve retraining of

specific duties or technical skills, rather harsh training was imposed as punishment.

For example, they were made to sit in the middle of the duty room in full view from the staff rest room, the guard station and the roll call location to copy out or write reports all day long about employment rules and business philosophy that were not related to events such as violations and negligence. They were not allowed to go to the restroom without permission from their supervisor, and were made to stand at the end of the platform all day to greet fellow crew members arriving and leaving. They were ordered to do weeding and clean the toilets on the premises, etc. In some cases, so-called “ naming ” and “ shaming ” was used. In others, a group of managers placed them under house arrest in a private room and threatened and abused them daily, leading to depression and suicide.

From the above, the following was pointed out : Nikkin Kyoiku had not led to any positive effects on preventive measures, on the contrary it had only added to the amount of psychological pressure experienced by the crew. The driver involved in the accident had received Nikkin Kyoiku on three occasions in the past due to driving mistakes and complaints. He told friends and people he knew how severe Nikkin Kyoiku was: he was made to write reports all day long. He hated asking permission to go to the restroom by his superior. He did not understand the meaning of simply copying company precepts, etc. and was worried what he would do if his salary was cut or if he were to lose his job. Furthermore, after a 72-meter overrun at Itami Station, just before the accident, it was clear that the driver was requested to report the overrun distance to the conductor using an on-board telephone.

Half a year before the accident occurred, National Diet members pointed out that such education “could only cause a serious accident”. In fact, it was picked up by the media that Nikkin Kyoiku was "a contributing factor behind the accident". The Ministry of Land, Infrastructure, Transport and Tourism’s accident investigation report states that

this kind of education is mostly emotional manipulation, and that the cause of the accident was thought to have been down to JR West's use of Nikkin Kyōiku.

In addition, the driver who caused the accident had only 11 months of experience, and shortly before the accident, experienced trainer drivers retired in large numbers, thus there was a conspicuous lack of able trainer drivers.

Consequently, this was all controlled by the punisher (fear of Nikkin Kyōiku), which only burdened the driver with excessive economic and mental stress. It would seem that we are always faced with the two-pronged issue of business priorities verses safety; everything is directly related to the working environment and working style (way of thinking and priorities); and sadly the lecturer thinks that this derailment accident was an accident waiting to happen.

Following the accident, transport safety management regulations were introduced in 2006 and integrated the previously separate aviation, railroad, land transport, and marine transport accident investigation bodies into one. With the launch of the now Japan Transport Safety Board in 2008, Japan transportation safety culture and organizations within have been reconfigured anew.