Invisible Mutuality between Structural Inertia and Learning Disability

— A Case Study of the West Japan Railway Accident 4.25 —

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Abstract

This article examines a case study of the JR (Japan Railways) West accident, which was the worst railway accident in Japanese history. The purpose of this research is to prevent similar accidents by focusing on organizational 'learning disabilities' (Garvin, 2000). We review firstly a summary of the JR accident. Secondly we review the irrational behaviour of the driver involved, which originated in the system of re-education of the JR West Company known as 'Nikkin Kyoiku'. Thirdly, we examine the interference with organizational learning bounded by 'structural inertia', and finally, we review the 'organizational disaster' in relation to the 'learning disability'. This research is concerned with compliance and corporate governance.

Key words: organizational disaster, learning disabilities, structural inertia, compliance, governance

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I. JR West Accident 4.25: Accident or Disaster?

Since the advent of railway-based society, tragic railway accidents have occurred in all time periods and countries, despite great progress being achieved every year in mechanical technology. For instance, 23 people died in Canada which accident occurred in 1986, 56 people died in France (1988), 101 people died in Germany in (1998), and more recently, 71 people lost their lives in China (2008), all due to railway accidents. Figure 1 shows accidents that have incurred many fatalities since 1980. Although the countries mentioned enjoy comparatively advanced technology, these accidents claimed many lives.

JR is the common name of the Japan Railways, the largest railway conglomerate in Japan, which has a history dating back to the privatisation of the Japanese National Railway (JNR) in 1987. On 25 April 2005, a derailment accident occurred on the Fukuchiyama Line of the Japan Railway West Company. In this accident, 106 passengers and the driver died, and 562 others were injured. The accident was investigated by the Aircraft and Railway Accident Investigation Commission (ARAIC), whose findings were released as the "Fukuchiyama Line Derailment Accident Investigation Report" (hereafter, *ARAIC's Report*) in June 2007. Figure 2 shows the derailment situation of the railcars during the accident site.

Just before the crash, the train overran its intended position at the previous station by approximately 72 meters. Because of an adjustment back to correct the location at the station, the train departed from Itami with a delay of 90 seconds. It passed through Tsukaguchi, which is the station following Itami on the route to Osaka, with a delay of 60 seconds. The train travelled at 116 km/h

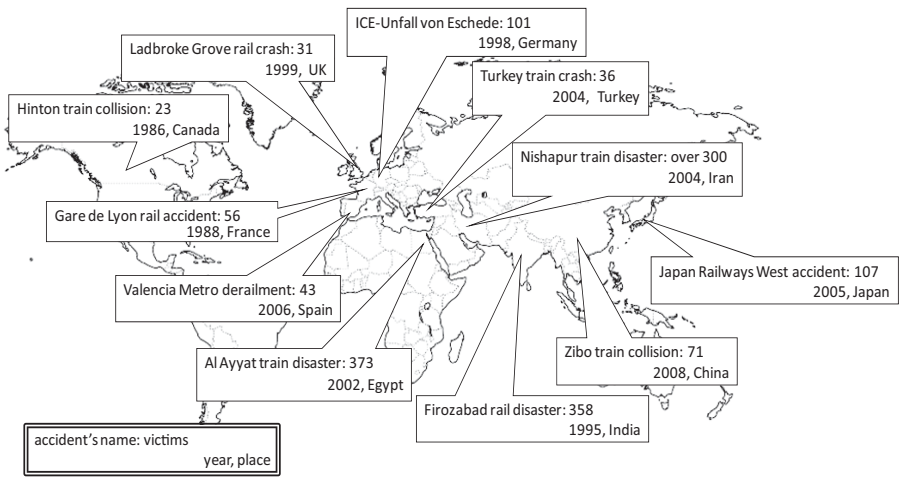

Figure 1 Railway accidents with many fatalities since 1980

(source: Nikkei Telecom 21).

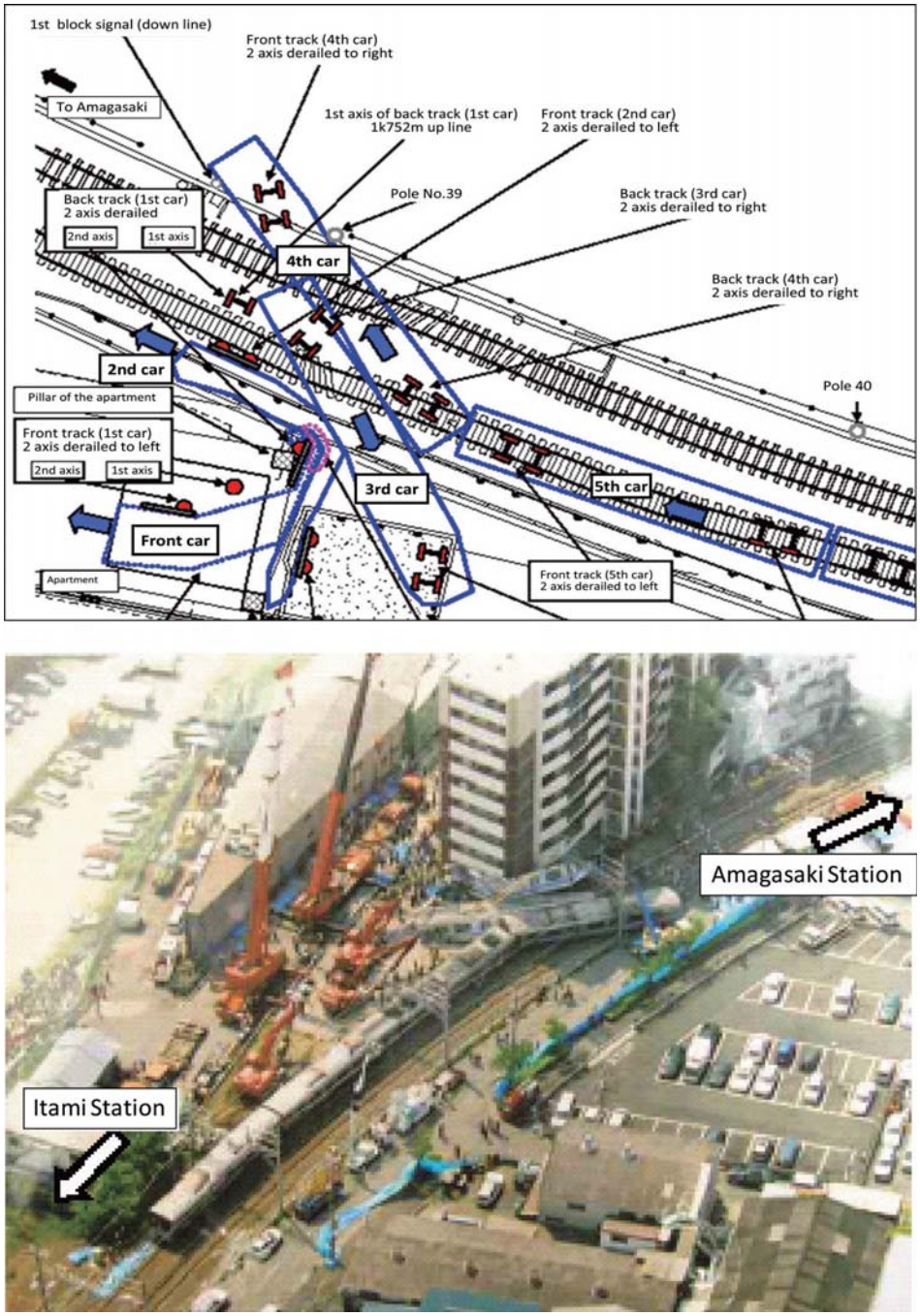

Figure 2 Derailment situation of train

(source: *ARAIC's Report* 2007)

on this section to make up for the time lost due to the overrun, and it then derailed on the curve between Tsukaguchi station and Amagasaki station on the JR Fukuchiyama Line. The excessive speed caused the two front cars to crash into an apartment building after derailment. The upper speed limit at the site was 70 km/h on a curve of 300-meter radius. In addition, the JR West had a congested railway schedule due to competition with other private railway companies. These situations are the cause of the driver's speeding.

II. 'Administrative Limitation' of 'Nikkin Kyoiku' as Organizational Disaster

The driver had not performed driving operations for 40 seconds just prior to the accident but had monitored the radio exchange between the conductor and the dispatcher and had made a note of it. The background to the driver's actions was described in the *ARAIC's Report* as follows: "There was concern about the 'Nikkin Kyoiku' system, which is the JR West's re-educational system, and the punitive measures that were experienced in the past". Figure 3 shows the dialogue between the driver, conductor and control dispatcher immediately before the accident took place (following Figure 8: α).

In this accident, while in actuality the train overran by approximately 72 meters at Itami-Station, the driver asked the conductor to submit a false report. The conductor accepted the request from the driver: "Please shorten the distance of the overrun" and reported an "8-meter overrun and 90-second delay" to the control dispatcher of train service management. The control dispatcher made contact with the driver for confirmation. The driver was in a dangerous situation because the reported 8-meter overrun is inconsistent with a delay of 90-second, as became clear from the train service recorder immediately after the train crashed. The *ARAIC's report* noted that the driver's dangerous driving was caused by fear of 'Nikkin Kyoiku', which he had experienced in his past. Figure 4 shows the handwritten memo which the driver was taking until the accident took place. The driver took the memo while operating the train for his 'self-defense' for 40 seconds he was not driving.

'Nikkin Kyoiku' is the re-educational system carried out for the purpose of preventing accidents and incidents, but a part of this system consists of punitive measures. This function is performed from 9:00 to 17:45 in the 'office work room' of each train division. This room is a space for office workers and administrators, and those who receive 'Nikkin Kyoiku' sit in the position labelled 'driver' in Figure 5. These personnel are required to work all day on a report under the supervision of an administrator or office personnel. Members who have received 'Nikkin Kyoiku' say "My ewposure to the other members made me feel uncomfortable."

'Nikkin Kyoiku' mainly consists of report writing, and it also includes a test that measures the driver's basic knowledge. However, the educator in charge determines the actual work content in

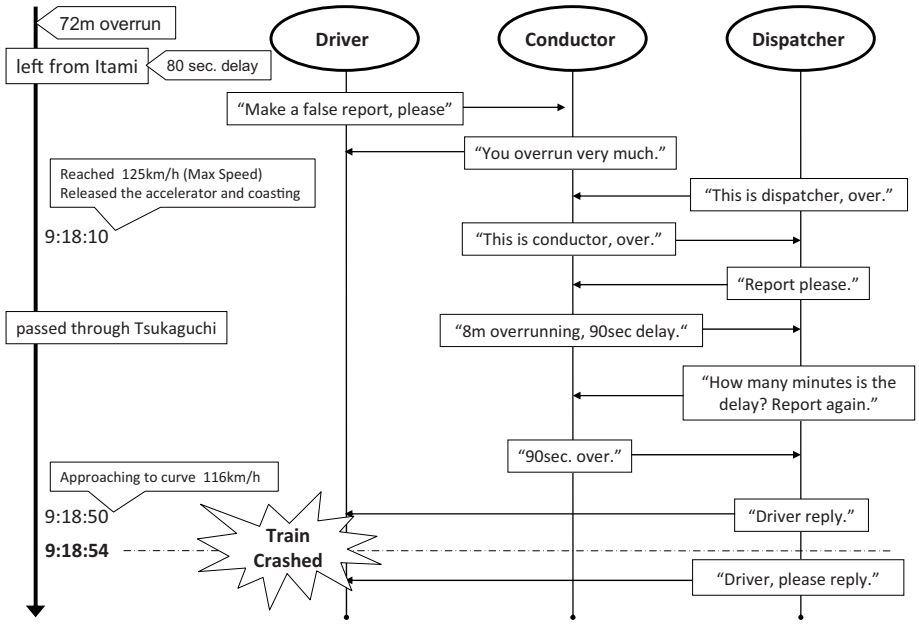

Figure 3 Dialogue of the JR West accident 4.25

(source: ARAIC, 2006, pp.4–16, pp.34–37).

Figure 4 Driver's original memo (Japanese evidence)

(source: ARAIC, 2006).

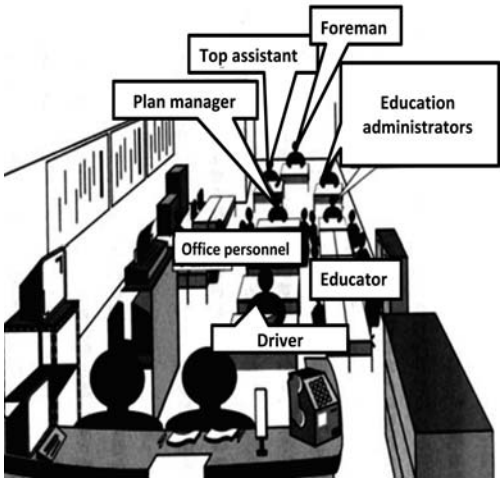

Figure 5 The situation of 'Nikkin Kyoiku' in the JR West
(source: Suzuki et al., 2007, p.67).

'Nikkin Kyoiku', and questionable chores of a 'punitive' character are also included, such as longhand 'copying of work rules' and 'weeding of train tracks or flower beds', as reported after this accident. In addition, anyone who undergoes 'Nikkin Kyoiku' may have his salary reduced.

Such a punitive education method is an example of the type of education method that former Japanese companies and the Japanese armed forces often adopted. One problem associated with this educational method is that it depends excessively on personal spiritual strength and concentration without investigating the cause of the failure.

Table 1 shows the number of suicides that have occurred at the JR West Company. From 2000 to 2005, 18 employees committed suicide, and on average, four people take their own lives each year. There are six railway companies in the JR Group each operating in a separate region: JR Hokkaido, JR East, JR Central, JR West, JR Shikoku, and JR Kyushu. No data exist regarding the number of employees overall who have killed themselves, and only JR West has been brought to the public attention. Although it cannot be concluded that the direct cause of these suicides is 'Nikkin Kyoiku', there is the possibility that problems exist under JR West's management (following Figure 8: γ).

The driver involved in the accident described above had experienced 'Nikkin Kyoiku' three times, for a total of 18 days. In addition, the driver occasionally complained to his friend that "I must write text all day long and need permission even to go to the toilet", as described in the *ARAIC's Report.* Following the accident, on June 1, 2005, a questionnaire was distributed to 3,096 drivers by the West Japan Railway Union, and 2,676 responded. Over 25% of the respondents

Table 1 The suicides of JR West's crews (from 2000 to March, 2005)

the date of suicide	situation	the date of suicide	situation
21 Mar, 2000	hanging	21 Apr, 2003	jumping in front of JR train
Summer, 2000	hanging	24 Apr, 2003	jumping from JR building
24 Oct, 2000	jumping in front of train	23 Jun, 2003	hanging
10 Jan, 2001	hanging	20 Jul, 2003	jumping in front of JR train
12 Jan, 2001	entering the water	1 Sep, 2003	jumping in front of JR train
8 Feb, 2001	jumping in front of train	23 Sep, 2003	hanging
24 Apr, 2001	jumping in front of train	31 Jan, 2004	hanging
6 Sep, 2001	hanging	Oct, 2004	jumping in front of train
14 Oct, 2001	hanging	13 Mar, 2005	suffocation by carbon monoxide poisoning

(source: Suzuki, et al., 2007, p. 164).

answered that JR employees felt dissatisfaction. As stated above, 'Nikkin Kyoiku' was the personnel management system. The purpose and result of this educational method diverged, and in general, the managers of JR West did not engage in 'double-loop' learning (Argyris, et al. (1978)).

III. Organizational Learning Bounded by the 'Structural Inertia'

In this accident, the driver did not operate normally and tried to protect himself from 'Nikkin Kyoiku', that is, the 'un-learning' processes of the JR West organization.

Firstly, the driver requested the conductor to make a false report. And the driver took the memo in an act of self-protection against undergoing 'Nikkin Kyoiku' in spite of the actual driving operation. With the driver's behaviour, his learning was a personal form of learning for his own self-protection, that is, it was **'un-learning'**; which means he could learn but refused to do so. Secondly, the conductor did not use the emergency brake, and worse, he did not know how to use it. In this case, learning did not materialise, that is, the situation involved **'non-learning'**. Thirdly, the dispatcher made contact with the driver for fact-checking despite the existence of an ongoing dangerous situation. The behaviour of the dispatcher followed the manual. However, this action was a mistake resulting from a lack of circumstantial judgment, that is, **'mis-learning'**. Finally, management's misunderstanding of the effect of 'Nikkin Kyoiku' is also involved because they ignored the feedback from company personnel and put profits above safety in their management policy. This decision-making process caused negative effects in learning, that is, irrational learning, or **'ir-learning'**.

'Nikkin Kyoiku', as stated above, is a re-education system used for personnel management and is designed to prevent accidents caused by 'human error'. However, this system led to 'human

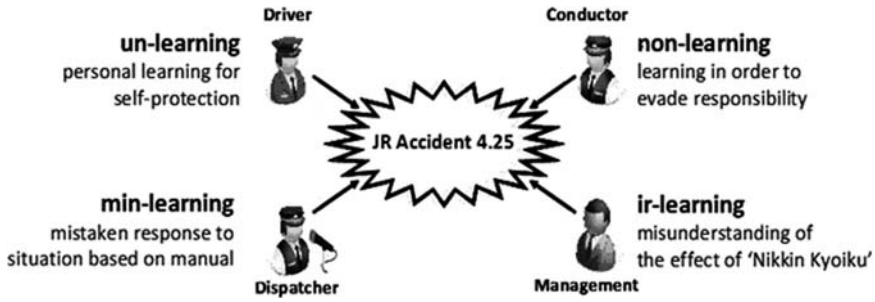

Figure 6 Four-layer model of 'learning disabilities' in the JR West accident

error'. JR West managed employees using the psychological pressure provided by 'Nikkin Kyoiku' and by attaching importance to manual labour without feedback. Ultimately, multiple 'learning disability' occurred at unit organization levels. The cause of these learning disabilities is the lack of communication between members of the organization, which forbade questions regarding organizational policy and objectives and concealed facts. These flawed traditions and customs led to 'organizational inertia'. That is, the organizational climate and culture reduced the mental horizons of its members, who were unable to think of anything except their own self-protection.

According to Reason (1997), 'security holes' – weaknesses and gaps in safety – always exist somewhere even if precautionary safety measures are taken. However, the taking of redundant precautions can be expected to solve this problem. Unfortunately, accidents can still occur because the holes in safety measures can occur in any location or even move and spread. While further improvements in technology may occur, the problem of railway accidents cannot be solved on a technological basis alone but must also be addressed from an organizational perspective that includes decision-making, personnel education and policy-making.

Several years after the accident, it became clear that JR West had required that the accident report be concealed from the investigating officials. JR West intervened actively in three facets – as 'representatives' of the public, within the investigating body itself, and among the supervisory authorities. As an example, JR West approached a speaker at a public meeting, arranged beforehand to tell the same story to the police, and then demanded a change in a report about 'a delay in the deployment of the ATS' from the investigators.

ATS: Automatic Train Stop

According to the ARAIC's Report, the cause of the accident was "human error", i.e., the accident was attributed to a delay in braking. In addition, these reports presumed that this accident could have been avoided by the Automatic Train Stop (ATS) device. The ATS is a

form of safety equipment designed to stop or decelerate trains to ensure safe operation. There are several types of ATS devices, and JR West has used a newer type (ATS-P) in place of the old type (ATS-SW) partly since 1990. In fact, the old type of ATS was incapable of stopping trains that are over speed. On 25 April 2005, ground ATS equipment was not installed in this railroad area - not even the old type of ATS. As the curvilinear speed was excessive, the accident was labelled as 'human error.' Moreover, this case involves 'double standards' regarding installation of the ATS device, as both the SW and P types were used by the supervisory authorities as the result of governmental policy. The government authorised use of the old type of ATS only for JR, whereas the major private railroad companies were required to install the newer type of ATS.

IV. Lost Compliance and Governance following Organizational Systems-error

A human-relation factor is involved in the problems with the ATS: namely, managerial decisions. There was a large difference in safety measures between JR West and JR East, within the same industry. JR East allocated a budget of 25 billion yen to safety measures, but JR West allocated only 3.5 billion yen. On the other hand, JR West greatly reduced its deficit after having switched from being a public enterprise to a private enterprise. It is thought that the managers of JR West might lack social responsibility in the decision-making process regarding the distribution of managerial resources. This is an organizational cause of the accident, the JR accident originating, as stated above not only from technological factors caused by lack of ATS equipment, due to delays in instal-

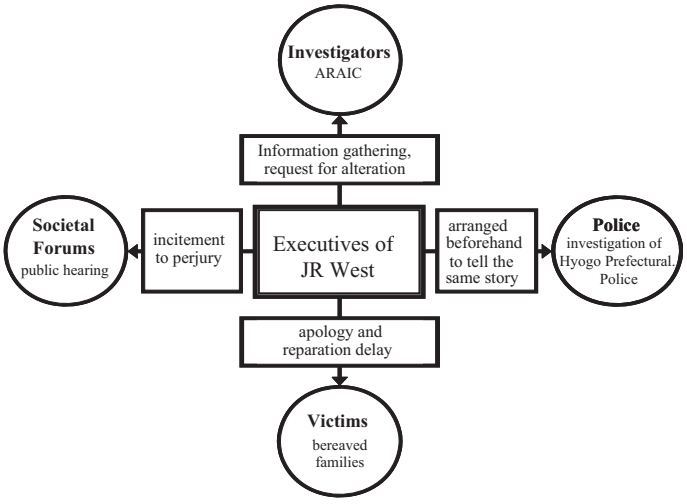

Figure 7 Negative agent model of JR West.

lation, but also from psychological factors present in the organizational personnel system then even extended to bribery. These are behaviors that are completely contradicted their apologies to victims. As Figure 7 illustrates, JR West has engaged in illegal behaviour with the 'lost compliance'.

According to Berle et al. (1932), governance is established based on the propriety of managerial power. Governance functions only if the managerial power rests on the premises of social propriety and neutrality. However, the illegal acts of JR West lie far from a sense of social ethics. The propriety that Berle insists on cannot be confirmed. A series of organizational injustices carried out by JR West represents negative governance based on the wrongful use of power.

Figure 8 shows the complicated factors in the JR accident. A summary of this accident indicates problems at three levels. Firstly, as stated before employees had learning disabilities at each level, representing the human errors that caused this accident. In this aspect, JR West's management could be described as 'ghost corporate governance'. Secondly, the problems with ATS and 'Nikkin Kyoiku' were the results of 'lost business ethics'. Human errors should be accounted for by the system, but in this case, the system itself embodied errors. Finally, some organizational factors existed. For instance: privatisation and 'a thousand dismissals'. In fact, the main problems underlying this accident are the culture and climate that were in place during the long history of the organization. This aspect can be termed 'forgettable social responsibility'.

There are many factors at work in the historical background of the JR West accident on 4.25. For instance the administration of JNR was responsible for the reconstruction of the organization

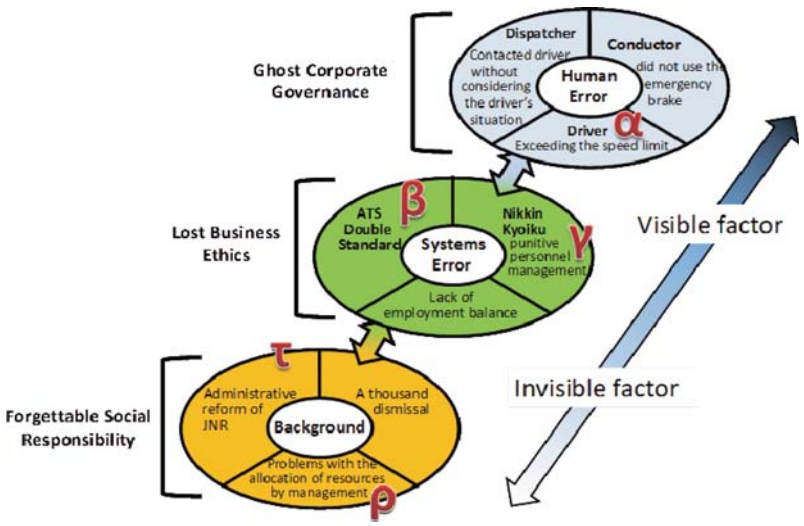

Figure 8 Invisible mutuality of the JR accident 4.25

(source: Atsuji Seminar (2007)).

that predated JNR – the so-called 'Kokutetsu'. The Kokutetsu was protected by the Japanese government and this organization had an entrenched 'structural inertia'. Furthermore JNR's organizational members are 'yes men lucky', that is, employees who profit anytime they agree with management decisions. On the other hand, the negative aspect was the learning disability of their organizational change. When reforming JNR, these agents had to undertake "a thousand dismissals". This meant the laying-off of a thousand employees of JNR with the decision making being Top-down. At the present time, the matter is pending in court. Many problems in the historical background have gradually begun to surface. Therefore, there are the problems with allocation of HRM (Human Recourse Management). That is the 'invisible factor' on the historical aspects.

V. Disaster Formula applying Organizational Accident of the JR West

In light of the current JR accident, we believe that we should establish the degree of danger involved in organizational accidents. Specifically, we suggest a formula for an organizational accident based on empirical data from the JR accident.

Formula for an Organizational Accident

$$\varepsilon = \alpha \times \beta \times \gamma \ / \ (\rho + \tau)$$

α: excessive speed β: ATS problems γ: Nikkin Kyoiku ρ: JR's management τ: railway policy

The 'Formula for an Organizational Accident' relies on five variables, for which empirical data are readily available: the human factor (in the case of JR, the driver's speeding and system of contact (α)), the physical factor (the 'double standards' of ATS (β)), the unexpected factor (the overrun or delay and fear of 'Nikkin Kyoiku' (γ)) and an estimation of the systemic fatigue in organizational management and the lack of clarity concerning railway policy (ρ + τ). This formula includes not only visible factors such as human error but also invisible factors, such as safety management and railway policy.

The trial of the ex-president of JR West was completed on January 11, 2012, and the judgment was "not guilty". He reconstructed the crash site and shortened the curve from 600m curve to 304m curve in 1996. He was also the person responsible for ATS equipment at that time. Additionally, in court, there were displays of organizational un-social behaviour by JR West. These behaviours were intended to protect the corporation and themselves, resulting in organizational inertia. It is essential that 'compliance' and 'corporate governance' are rejected by such organizational inertia.

Figure 9 shows the new administration method which we want to suggest. If the organization causes some problems or scandal, it is necessary to regulate it in an external environment. For

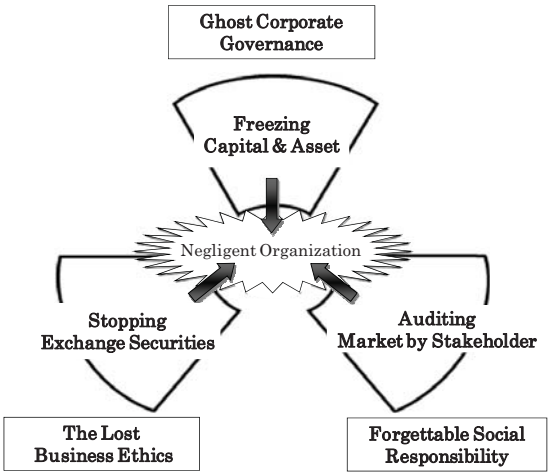

Figure 9 The new administration method for negligent organization from three aspects

instance, the supervisory authorities can freeze the capital and assets of the company by force when the organization practises ghosting corporate governance, and can stop the exchange of securities when there is a loss of business ethics. Furthermore, stakeholders can audit the market for forgettable social responsibility. In such ways, in order to regulate an organization that has negative inertia, it is essential to give the supervisory authorities the executive faculty which regulates organization by force.

The longer the history of an organization, the more strongly organizational inertia can develop, and this inertia cannot be changed easily. When similar accidents occur, individuals can evade individual responsibility because these accidents are not caused by individuals but are the result of organizational behaviour. We attach great importance to the creation of new laws that can judge organizational behaviour. However, that is the role of government. JR West should reconsider the relationships of various stakeholders based on their social responsibility with compliance and governance as a public service organization by making use of a review of the failures involved and they should undertake a radical rebuilding of the decision-making process of the organization.

Conclusion

Railway accidents cannot be solved only from a technological viewpoint, but also must be addressed from an organizational perspective, using the case study of the JR West accident as the worst ‘organizational disaster’. The purpose of this article is prevention of similar accidents, by focusing on organizational learning disability. We review firstly, a summary of the JR accident,

secondly, the irrationality of organizational behavior, originating in the re-educational system of JR West 'Nikkin Kyoiku', thirdly, the interference with learning disability of members by the organizational structural inertia, and finally, we discuss the possibility of improved compliance and corporate governance.

Acknowledgments

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