

# Analysis of the Hebei Spirit Oil Spill Incident and its Aftermath

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## 허베이 스피리트호 유류오염사고와 그 영향에 관한 분석

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**Abstract :** *The Hebei Spirit oil spill incident occurred in December 7, 2007 and caused approximately 12,547 kl of crude oil spillage along 370km off the west coast of Korea. Due to the astronomical and irrecoverable damage to the marine ecosystems and the overall living standards of the residents, the oil spill incident has been notoriously named as the “worst oil spill incident” occurred in Korea. Nevertheless, though almost a decade has passed since the tragic incident in Korea, it appears that compensation and recovery efforts seem not close to satisfaction and the local residents are still struggling with various negative impacts incurred by the incident because of critical cleavage among the interests of the relevant parties to the incident. In this paper, the analysis of Hebei Spirit oil spill incident regarding two aspects was carried out; First, meticulously analyze the practical and statistical data of the incident to precisely examine the fundamental causes for its occurrence to further prevent the reoccurrence of such disastrous incident; and the second, comprehensively inspect reasons for the protracted and inefficient damage recovery and victim-oriented compensation. To be specific, this study observed the levels of compensation against damages from the incident, and the adequacy of it in terms of ultimately and inclusively addressing financial, social and ecological aspects based primarily upon the legal verdicts, and statistical and empirical surveys.*

**Key Words :** *Hebei Spirit, Oil spill, Worst oil spill in Korea, Aftermath of incident, Compensation for damages of incident*

**요 약 :** 2007년 12월 7일 발생한 허베이 스피리트호 유류오염사고는 약 12,547 kl의 원유를 유출하였으며, 한반도 서해안 약 370km의 오염을 발생시켰다. 이 사고는 우리나라에서 발생한 유류오염사고 중 최악의 유출사고로 기록되고 있으며, 해양 생태계와 인근 주민에 막대한 피해를 야기하였다. 사고 이후 10년 가까이 지난 현재 사고에 대한 보상과 복원이 진행되고 있으나, 사고의 영향이 완전히 해소되진 않고 있다. 본 연구에서는 허베이 스피리트호 유류오염사고를 두가지 측면에서 분석하였다. 먼저 사고 당시의 기록에 근거하여 사고의 근본 원인을 분석하고, 사고의 재발 방지를 위한 법적 제도적 개선 방안을 제시하였다. 또한, 사고로 인한 피해 복구와 주민 피해 보상 과정을 검토하고, 피해 복구와 보상과정의 현황과 이로 인한 영향을 분석하였다. 특히 피해 복구와 보상과 관련해서는 손해배상의 수준, 법적 인정 사례, 피해 보상 영향 등을 검토하였으며, 이를 통해 사고의 피해와 복구 과정에서 나타난 사고 영향을 분석하였다. 아울러 이를 근거로 허베이 스피리트호 사고 피해와 복구의 사회경제적, 환경 생태학적 타당성을 포괄적으로 검토하였다.

**핵심용어 :** 허베이 스피리트, 유류오염, 한국 최악 유류오염사고, 사고 영향, 사고 손해보상

### 1. Introduction

In the 21st century, the world has been significantly industrialized. Along with the rapidly expanding global markets and corresponding economic growth, the number of trades in coastal areas has been enormously escalated as well. However, unfortunately, the increased number of costal trades not only

promoted the decent outcomes, the general economic growth of the world, but also the indecent repercussion, the aggravation of natural distress. Especially pertaining to the marine environment, where a number of marine transportation conveys industrial products, the environmental circumstances has been significantly deteriorated and polluted.

A number of oil spill incidents that had taken place in Korea are the ostensible evidence for such undesirable contingency of rapid industrialization. For instance, Cho (2007) reported that the

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oil spill incident by a oil tanker called, “M/T Sea Prince”, occurred near Sori Island, Yeosu, Jeonlanam-do (province) had broken out in the midst of seeking a refuge from the typhoon “Faye” in 1995 leaking approximately 5,000 tons of Arabian crude oil. As a result, the spilt oil from the M/T Sea Prince severely contaminated approximately 230 km coastline demanding more than 5 months remove the remains. Also Shim et al. (2001) reported that the oil spill incident of M/V Yuil No.1 occurred near Namhyoungje Island which was towed to the Busan in 1995, detrimentally harming the marine environment with more than 2,000 tons of oil. In addition, the oil tanker M/T Honam Sapphire incident causing spill over 1,000 tons of crude oil in Yeosu Bay in 1995, can be marked as a reoccurrence of oil spill in Yeosu Bay, where M/T Sea Prince’s collision occurred 4 months ago. Lastly, and most recently, the Hebei Sprit Oil Spill incident occurred on December 7, 2007, by the collision between the crane barges near the port of Daesan off the west coast of Korea, driving to leak about 12,547 kℓ of oil, which, in turn, is often referred to as the Korea’s worst oil spill incident (Lee et al., 2009).

Likewise, taking the numerous instances and the most recent and disastrous incidents that had taken place in Tae-an, Korea into consideration, it is ostensible that Korea is not an exception from the threat of potential oil spill incidents and the marine environment pollution. Nevertheless, practical measures to effectively examine and ultimately cope with such imperative issues seem to be insufficient at status quo, and the ultimate recovery of the situation has been remained incomplete.

As such, in this paper, the causations and feasible resolutions for the most recent oil spill incident, the Hebei Spirit incident would be analyze meticulously to further behoove the readers to problematize the imperativeness of marine environmental issues and necessity for the adequate victim-oriented coping measures.

## 2. The Hebei Spirit Oil Spill Incident

### 2.1 The Context of the Incident

The process of the occurrence of the Incident is as follow. On December 7, 2007, the oil tanker called M/T Hebei Spirit, conveying approximately 302,640 kℓ (263,945 tons) of Iranian crude oil, was collided by a crane barge, Samsung No.1, near Daesan port which was 10 km off the coast of Taean-gun, Korea (Lee et al., 2008). Due to the critical clashes, approximately 12,547 kℓ of crude oil from the oil tanker was spilled along the west coastline of Korea. Since the floating oil on the surface of

sea is extremely susceptible to weathering, the boundaries of the spilled oil had been spreaded out over several hundred kilometers along coastlines within a month by winds and currents (KCG, 2008).

### 2.2 Impacts of Oil on Marine Environments

Unfortunately, the spilled oil from the Hebei Spirit incident in December 2007, was mostly covered to the offshore of the Korea west coast in the Yellow Sea, even in the very sensitive shoreline of the Korea west coast. Because of such contingency, the removal process of the astronomical amount of oil spilt had become much more challenging. The spilt oil spread had been unprecedentedly covered in large areas including areas of coastlines of the Chungcheongnam-do (province) and then the spillage gradually extended its coverage into regions to the south, the Jeonla-do (province) and Jeju Island coast. Consequently, the incident impacted 350 km<sup>2</sup> of fishing nurseries/farming areas located in the Chungcheongnam-do (province) and Jeonla-do (province) causing the extreme expansive damage to the coastline, approximately 375 km, which includes the mainland, 100 offshore islands and 15 beaches (MLTM, 2012). Moreover, more than 43,000 fishing households accounting for more than 97% in the Southern Chungcheonganm-do (province) had been severely suffered from the unexpected contamination.

### 2.3. Responses to reduce Impact of Oil

Because of the inclement weather conditions and environmental circumstances, the immediate measures attempted by Korea Coast Guard (KCG) to effectively tackle the emergency had been abortive. To be specific, only after the two days had passed since the initial disruption of the incident, parts having holes of vessel was patched by successful implementation as urgent response activities (KCG, 2008). After four to five days since the incident, practical measures had been intensively conducted in order to remove the massively emulsified spilled crude oil. Based on the guidance of the National Contingency Plan (NCP), the KCG had established the National Response Team (NRT) with cooperative agencies/organizations and local authorities, to develop an immediate actions to resolve the situation in a more systematically (KCG, 2008). First, the NRT had proclaimed a priority plans to block the spreading oil and further prevent the inflow of oil to the sensitive areas, most of which are directly related to fisheries industries and enclosed coastal zones. In addition, the NRT which was operated with four teams composing of shoreline clean-up

team, at-sea response team, logistics team, and scientific support team, took responsibility of overall response strategies, prediction of oil trajectories, use of dispersants, decision of response equipments and technologies, support and management of equipments, and treatment of oil wastes.

### 3. Analysis of Causation and Issues of Responsibility

#### 3.1 Decree on the Responsibility of the incident

According to the official legal verdicts proclaimed by Korean Maritime Safety Tribunal on December 4th, 2008 and those announced by Daejeon District Court on December 10th in 2008, both the M/T Hebei Spirit and the crane barge owned by Samsung Heavy Industries hold significant responsibility for the disruption of such disastrous incident.

First, the Korean Maritime Safety Tribunal criticized the fact that “Marine pollution case due to collision between the tugboat Samsung T-5 and Samho T-3 and the subsidiary tow Samsung 1 and oil tanker M/T Hebei Spirit” was under the new trial decided that the main cause of the collision (1st incident) is “Sailing tugboats failure to take pre-measures under sudden weather changes and their restricted control on the rough sea, and yet continuing to sail dangerously without taking any safety measures such as emergency anchoring which led to the breakage of the towing line of the Samsung T-5’s causing its subsidiary tugboat Samsung 1 to drift towards the M/T Hebei Spirit”.

Also, “On the vessel’s side, the anchoring ship’s negligence of duty to take active action to prevent collision at the early stage and the fact it failed to take action to avoid when the collision was imminent because the main engine was not prepared” was ruled as the partial cause.

#### 3.2 Analysis of the Causation of the incident

Based on the analysis of the official verdict regarding the incident and empirical analysis articulated in “White Paper on Response to Hebei Spirit Oil Spill Incident” written by Lee et al. (2008), major reasons for the occurrence of the Incidents can be deduced as follow.

##### 1) Inconsiderate Navigation of the M/T Hebei Spirit and Inadequate Initial Response to the Incident

The No.1 crane barge owned by Samsung Heavy Industries decided to navigate, despite the expected inclement weather

conditions. Although it were fully acknowledged of the rough weather, the crane barge even disregarded the “wind wave advisory” and proceeded on its navigation as is initially planned. When it eventually recognized the imperativeness of the weather conditions, it was too late to adjust the direction of the navigation (Lee et al., 2008).

##### 2) Negligence of the Relevant Party and the Passive Reactionary Response to the Situation

On the day of the incident, the chief mate of the M/T Hebei Spirit had negligently delegated his duty as a main navigator and supervisor of the vessel to a temporary position intern navigator. Without paying considerate attention to the navigation conditions, the chief mate had neglected its grave duty. Had it not been for the negligence of the relevant party, the Hebei Spirit Oil Spill Incident could have been prevented in advance, as the imperativeness of the situation could have been detected earlier and earned more time to initially cope with the time-ticking situation (Lee et al., 2008).

#### 3.3 Analysis of Responsibility for the incident

The reasons for the incident can be attributed to the two factors: first, the negligence and the passive reactionary responses of the relevant figure, and second, the reckless navigation of the ships, initially disregarding the inclement weather conditions. Nevertheless, according to the further elaboration on the “White Paper on Response to Hebei Spirit Oil Spill Incident” by Lee et al. (2008), the occurrence of such incident should be fundamentally attributed to the embedded problems of our society, which might have forced such disruption of the incident.

##### 1) Inadequate Safety Regulation

In anchoring large vessels such as the M/T Hebei Spirit, systematical safety regulation should be conducted. However, such regulatory conditions are absent in the legal regulations of Korea. As such, to safely secure the marine environment and to further prevents the reoccurrence of such incident, specific legal regulation regarding the safety anchoring of large vessels should be established.

##### 2) Malfunction of Navigation Regulation

Considering the environmental conditions that also significantly affected the onset of the incident, rigid regulation regarding the navigation for large vessels of under the inclement weather

conditions should be established. However, at the status quo, Korean legal systems does not specifically state such regulations. Henceforth, the strict enforcement of regulating navigation under the inclement weather conditions should be established.

### 3) Malfunction of Navigation Control

As ostensibly indicated in the M/T Hebei Spirit Oil Spill Incident, the major cause for the incident was the negligence of the relevant parties. If they had rapid and effective communication and mutually paid meticulous attention to each other, such tragedy would not have occurred. As such, since incidents occurred due to the negligence of human beings can be mostly prevented in advance, the reinforcement of navigation control system is highly demanded to effectively prevent the reoccurrence of such tragic incident in the future (Lee et al., 2008).

In conclusion, as indicated through the verdicts announced by Korean Maritime Safety Tribunal and Daejeon District Court on December 10th in 2008, the responsibility for the disruption of the Hebei Spirit Oil Spill incident is primarily resided upon the negligence of the relevant parties. Nevertheless, the problematic aspects of our society in terms of restoring social resources should be also shed in light. As such, for the ultimate recovery from the incident, nation-wide efforts in supporting the restoration of the environmental distress and damage on the residents' lives, along with the individual participants, are highly required.

## 4. Issues of Compensation

Although a lot of discussion on regime of liability and compensations for damages from oil pollution, as Viscusi and Zeckhauser (2011) suggested, not a concrete agreement on this multi-national and multi-factorial problems had been established. As there exist severe cleavages in discerning the significant factors relevant to determining the sereness of damage, including on the ways to find damages from oil pollution which needs to be estimated and determined, and on respective organizations and personnels that should be determined the compensation issues, it seems extremely challenging to develop on sufficient and satisfactory compensation and supports for recovery (Kim et al., 2014).

According to 1992 Civil Liability Convention (CLC), the damage incurred by the oil contamination is the "loss or damage caused outside the ship by contamination resulting from the escape or discharge of oil from the ship." However, the compensation for

the environmental damage is specifically confined to the costs of measures of reinstatement for the incurred facilitation, and a monetary loss of profit due to such deficiency (IOPC Funds, 2017). As a result, such restrictive regulations proclaimed by the CLC have substantially limited the expansive coverage of compensation by considering total loss of economic, social and ecological value. What the CLC indicates by the lost social and ecological value are estimated from coastal environmental resources and human resources (Carson et al., 2003; Kennedy and Cheong, 2013; Hutchinson et al., 1995; Kim, 2013).

### 4.1 Analysis Compensation Claims

When it comes to addressing compensation issues, severe conflicts among the relevant parties are generally indispensable. Due to the fundamental cleavage in pursuing interests of the relevant party, it might be even impossible to develop a panacea to effectively promote consensus among the pertinent entities. Followings are the relevant acts regarding the compensation issues in the domestic laws of Korea: 1) the Compensation for Oil Pollution Damage Guarantee Act in Korea (1992), 2) 2008 Special Act, which provides substantial aides for the incurred damages and suffering residents by the incident; and 3) the framework act on disaster and safety management specifically pertaining to special disaster districts (Kim et al., 2014).

Because of the strict premise regulated based upon the CLC and the 1992 Fund, demands of victims for proper compensation in the incurred regions cannot be reflected, and further accommodated. Moreover, the designated procedure for the compensation and recovery of the environment had been significantly protracted. Furthermore, since Korea has not a member of the IOPC 2003 Revised Agreement, which increased the compensation level to maximum level until 2010, the benefits of the adjustment could not been applied to the incident in December 2007 (IOPC Funds, 2013). As such, the maximum compensation level for the victims of the incident had been determined according to 1992 Fund, and it approximately turned out to be KRW 321.6 billion (203 million SDR), accounting for KRW 186.8 billion (89.8 million SDR) for the 1992 Liability Convention (IOPC Funds, 2013). In fact, according to the Technical Report published in 2012 called, "Environmental Impact Assessment and Environmental Restoration of the Hebei Spirit Oil Spill (MLTM, 2012)", the covered compensation in accordance to the formal premise, is only about the half of the damages compared to the estimates calculated by ITOPF (International Tanker Owners Pollution Federation Limited)

in 2008 (KRW 782 billion). A total 127,471 cases had been claimed for compensation, which sums up to be KRW 4.3 trillion; however, out of the requested claims, only 49.6% (63,201 cases) was officially approved to be paid, but for only 17.4% of the claimed amount KRW 752 billion were also subsidized. Also, pertaining to disaster prevention cases only 36.9% of the total claimed amount KRW 223 billion were supported. It could be explained, exempt for the disaster prevention (14% of the total claims), only 10% of the claimed amounts KRW 530 billion was turned out to be approved (Kim et al., 2014).

#### 4.2 Analytical Reasons for the Prolonged Recovery

The Hebei Spirit Oil Spill Incident is renowned for its rapid recovery to a certain extent. Thanks to the enthusiastic voluntary participation, and the immense supports from Korean citizens through various means, the spilt oil and hazardous substances in the contaminated costal area due to the Hebei Spirit Oil Spill Incident had been removed with an unprecedentedly rapid rate. Nevertheless, the immeasurable damage upon the residents in the costal area has been still remaining since the initial outbreak of the Hebei Spirit Oil Spill Incident. As the majorities of residents in oil contaminated coastal regions directly are related to the marine environmental conditions, the significant deterioration of the coastline environment does threaten the residents' lives from the foundation.

Then, despite of such supportive aids and eager voluntary work of Korean citizens, what have fundamentally engendered the protraction of long-term damage and hindered the recovery of the marine ecosystem? Among a number of obstacles relevant to the issue, specifically, the absence of "participatory governance" for the sake of victim-oriented restoration should be attentively discussed.

When it comes to resolving such complicated incidents that are intricately enticed with the causes of environmental and man-made calamity, it is significantly challenging to ultimately appease the conflicts among relevant figures, as each of them, respectively, pursues for different aims. That is to say, as so-called assailants and victims of such incidents are highly inclined to substantially prioritize their own benefits and damages, it is extremely difficult to develop a practical means to address the situation demanding the cooperative support and participation of all. However, ironically enough, what is the most critical factor for the ultimate resolution for such incident is the "collaborative efforts" among the relevant figures, regardless of attackers and sufferers (Park, 2008).

### 5. Aftermath of the Incident

Fortunately, as time passed by, the negative contingency against the recovery process of the incident had been appeased to certain extent. Considering the improvement of stakeholders' views on restoration, it seems to be a desirable outcomes with positive responses from the relevant entities to the incident. Such positive transitory in responses are mainly because of various economic recovery programs managed by governmental sectors, substantially assisting residents in the affected areas through ways of financial support, urgent aid for emergency subsistence, coastal restoration campaigns with public awareness activities. It is noteworthy of stressing on the cleanup efforts by millions of Korean citizens volunteered and this movement played a critical role in alleviating the damage incurred by this incident.

Nevertheless, despite such gradual and extensive efforts in various aspects, positive responses from the residents were only 15.3%, significantly implicating the insufficiency of current status quo for the recovery actions (MLTM, 2009). Negative responses were remarkably reduced among housing and living sector as well as in the tourism sector. However, the sectors related to income accounting for both fisheries and tourism rather revealed relatively less satisfactory response regarding the progress on the incident recovery and covered compensation, which, in turn, ostensibly implies that still considerable amounts of time, efforts and resources are required to reach a level of a full recovery. Positive responses are scarcely revealed in the business sectors including fisheries and tourism as turning out with values of 5.0% and 11.2%, respectively (MLTM, 2009; 2010). For instance, fishing cooperatives, the most influential central organizations for the fisheries industries in coastal towns in Korea, addressed that, with proper operation of joint fishing grounds and management of community, certain degree of improvement in fishing cooperatives communities had been accomplishment: 35.9% positive and 21.6% negative (MLTM, 2010). However, conflicts between the stakeholders, including the responsible parties (Samsung Heavy Industries and ship-owners), victims (residents), and respective administrators remained in tension. In accordance to the survey results, it explicitly indicates that almost 81.7% of relevant figures responded negatively regarding the recovery of conflicts among the incident stakeholders, and even 47% of people rather argued for the aggravation of the situation (MLTM, 2010). Most conflicts usually triggered because of the issues regarding

prevention and control, enactment of special laws, livelihood support, and damage compensation at the early stage. However, they, in turn, transformed and expanded into other issues including timing of work resumption, termination of prevention and control measures, and compensation for losses (Kim et al., 2014).

Thus, three representative results can be deduced from the analysis of the survey responses. First, the environmental distress initially incurred by the incident has been alleviated to certain extent. Second, the recovery mechanism regarding the fishery industries and tourism sectors has engendered positive improvements. Third, despite the aforementioned enhancement, the agreement on the issue of compensation and recovery progress seems hard to reach.

## 6. Conclusion

Through the analysis of the incident of aftermath assessment and the divergent responses for the survey inquired to the relevant figures of the incident, it is ostensibly revealed that the level of compensation and support for the damaged communities from incident are significantly unsatisfactory even after almost decades since the initial outbreak of the incident. Because of remaining potential toxicity still incurring the sediment quality and residual amounts of oil residues in soils, the long-term effect of oil contamination in areas affected by the incident had been prolonged, which in turn resulted an abortive consequence in restoring the overall societal, economic, and ecological stability of the affected region. In addition to that, the fundamental schisms among the relevant figures to the Incident are also the immense obstacle for the complete recovery and restoration of the distress. Nevertheless, as the statistics based on the aforementioned surveys implicitly indicates, at least a little amount of progress are achieved through the collective efforts of the government and the citizens. Henceforth, it is truly expected that in the near future, more of a significant level of progress in the recovery and compensation issues could be successfully accomplished with the further effective and considerate mechanism for victims, along with an effective mechanisms to further prevent and efficiently cope with such environmental distresses. Although the ranges of the research are limited, the analysis generated from the incident case study ostensibly reveals not only the imperativeness of the marine environmental issues owing to severe contamination, but also necessities in adjusting certain aspects of our social structures.

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Received : 2017. 08. 07.

Revised : 2017. 08. 18. (1st)

: 2017. 08. 25. (2nd)

Accepted : 2017. 08. 28.