



海上交通秩序之探討

Examining the Maritime Transportation Order

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前言

依據我國「海岸巡防法」第四條之規定，行政院海岸巡防署（以下簡稱海巡署）執行事項包括海上交通秩序之管制及維護。由於「航行自由」的傳統理念及海面的遼闊，海上交通與陸上交通不論是載具性能、交通監測功能或執法方式等都有很大的差異。如果全依陸上交通之管理方式來執行海上交通秩序之維護，不但不易發揮成效，還可能會引起國際糾紛。因此，本文就海上交通管理之特性進行分析，並與陸上交通作比較，提供海巡署作為執法之參考。

Foreword

As provided under Article 4 of Taiwan's "Coastline Patrol and Defense Act", the mission of Coast Guard Administration of Executive Yuan lies in monitoring and maintaining maritime transportation order. And as bound by the conventional concept of "freedom to navigate" and the expansiveness of the seas, there are significant differences between land transportation and maritime transportation in terms of carrier functionality, transportation monitoring functions, methods of law enforcement and the like. Transplanting the transportation administration mode of land to seas and oceans not only hinders the realization of expectant yield but also can easily lead to international disputes. Therefore this article attempts to analyze the characteristics of maritime transportation

administration, and to compare it with land transportation administration which could serve as references to the Coast Guard Administration in practicing maritime law.





海上交通管理之特性

船舶航行沒有航路的限制，只要有足夠的水深，任何方向都可前進。另因船舶在航行時，航向的改變也沒有一定的準則，因此，不同航向與速度的船舶分佈於海面各處，造成各種角度的會遇，產生碰撞危機。但是船舶在採取避讓措施時，又會受到運轉慣性及主機性能的影響，轉向及減速無法立即達成，避讓行為受到延遲常是海上碰撞之間接原因。商船之船速一般介於每小時 27 至 45 公里之間，與陸上車輛相比，速度明顯較慢。可是船舶動向的不定性，加上會遇情境之複雜性，海難事故也就時有所聞。海難救助在作業上困難度很高，不但危及生命及財產之安全，也會造成海洋污染。要減少海難就必須加強交通秩序之管理，降低航行自由的權利。

Characteristics in Maritime Transportation Administration

No sailing routes limitation, vessels can navigate in any direction as long as there is sufficient depth of water. In addition, there is no persistent rules in changing the navigational direction when vessels sail through the sea. As a result, with vessels taking different courses and sailing at different speeds scattered all over the surface of the sea, a host of angular rendezvous could easily lead to the maritime crisis of vessel collisions. While a vessel may try to circumvent the situation, a vessel's rotation force and engine performance often hinder a ship from making a turn or slowing down the speed within a relatively short time, making delays in circumventing a frequent indirect cause in maritime collisions. As the boat speed of most commercial vessels falls between 27 and 45 kilometers per hour, which does appear to be relatively slow compared with land transportation. Yet as marred by the instability of vessel motions, coupled with the complexity of all probable scenarios, maritime incidents are often reported. Highly difficult to rescue, maritime incidents not only hinder the safety of lives and properties but often create ocean pollution. In a move to reduce maritime incidents, it would become necessary to step up the administration of transportation order and to reduce the right to navigate freely.





海域為國際船舶共同行駛之空間，從內水延伸至領海、公海，所有海域之交通規則必須有其一致性。「1972年國際海上避碰規則」是現行所有船舶航行及避碰所應遵循唯一的國際公約。該規則除規定各類船舶在白天及夜間所應懸掛之號標及號燈，以及能見度不良或運轉應鳴放之音響信號外，並將海上船舶之間複雜的會遇關係分成三種：追越、迎艏正遇及交叉相遇。任何動力船舶在追越其他船舶，均應避讓被追越船。迎艏正遇的兩船均屬讓路船舶，應各朝右轉向，互在對方的左舷通過。兩船交叉相遇含有碰撞危機的情況下，見他船在其右舷者為讓路船舶，應朝右轉向或減速慢行；如果讓路船舶未依規定採取避讓措施時，直航船舶就必須採取避讓措施。船舶在海上會遇之狀況比陸上車輛交會的情況複雜許多，該規則也僅能作原則性之規定，同時受制於各國主權，該規則也沒有違規航行之罰則。

世界各國在重要的港口、交通繁忙或航行困難的海峽及近海均會設定航道系統，主要採用分道通航制(Traffic Separation Scheme; TSS)的設計，將航行海域劃分成兩條對向之航行巷道，巷道之間則以分隔區加以區隔。分道通航制係引進陸上反向車流分道的觀念，使航向單純化，避免迎艏正遇的情形發生。航道系統限制了船舶航行範圍及行進的方向，有些航道還限制航行速度，以加強海上交通秩序之維護。航道內之執法比較嚴格，對於違規航行之取締必須有足夠的證據，可是違規行為卻都無法以目視來分辨。設定航道系統的重要水域均會增設船舶交通服務系統(Vessel Traffic Services; VTS)。從歷次的海

Given that sea territories are the space international vessels navigate collectively, the transportation rules for all sea territories extending from the inner waters to the territorial waters and open seas would need to be kept consistent. "International Maritime Collision Prevention Rule of 1972" remains the only international treaty to be followed in vessel navigation and collision prevention to date. The rule not only stipulates signage and beacons that a host of vessels are required to display during daytime and nighttime and sound signals to be horned off in poor visibility or under normal operation, but further classifies the complex rendezvous relations of vessels at sea into three types: chase to surpass, frontal rendezvous and crossover rendezvous. Any powered vessel that chases to surpass other vessels need to avoid and yield to the vessel being chased. Two ships in a frontal rendezvous would render both as yielding vessels whereby steer to the right and bypass each other with their respective broadside on the left. Under the circumstances where two vessels in a crossover are at risk of collision, the one sighting the other in its right broadside would become the yielding vessel whereby steers towards right or reduces the speed to slow sailing. Suppose the yielding vessel has failed to abide by this yielding measure, the straight navigating vessel would need to seek yielding measure. And given that situation that vessels are likely to encounter at sea are definitely more complex than vehicles that rendezvous on land, said rule could only heed to principle stipulations, and as curtailed by national sovereignty, said rule does not have punitive clauses for navigational violations.

Countries around the world would invariably define a navigation course system at crucial ports, straits and near coastal areas of busy maritime traffic or of navigational barriers, which primarily heeds to a traffic separation scheme (TSS) design dividing a navigation sea territory into two opposite navigation lanes, and in between the lanes are segregated by a dividing zone. The traffic separation system has essentially adopted the opposite traffic flow concept on dry land, intended to simplify the



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難事故中，沿海國已深切的體認到如果僅靠船籍國執行船舶與船員的管理，根本無法有效地監督船舶航行，況且有些船籍國並未嚴格執行船舶管理與船員考核。有鑑於此，沿海國導入飛航管制的觀念，直接介入船舶的航行管理，由岸上管制人員利用電子及雷達設備監測船舶航行。VTS 可歸於助航設施之一種，但它並非靜態設施，而是能主動收集與傳送資訊，在管制措施與程序的規範下，利用報位與監控系統，再配合航道系統，岸上管制中心可直接掌握附近海域內所有船舶的動態，協助船舶避開碰撞危機或危險海域。許多研究報告均證實，VTS 可減少 40%~70% 海上碰撞事故。



navigation direction and avoid the frontal rendezvous. As the navigation course system restricts the range and forward direction of vessel navigation, certain navigation courses further restrict the navigation speed, which is intended to step up maintaining maritime transportation order. Law enforcement within the navigation courses is stricter. The reporting of navigation violations requires sufficient evidence, however, the act of violation might be difficult to tell by sighting. Vital waters that have had a navigation course system defined would tend to add vessel traffic services (VTS). Vital waters that have had a navigation course system defined would tend to add vessel traffic services (VTS). Learning from past, sea-bordering countries are keenly aware that vessel navigation cannot be monitored effectively only relying on administration of vessels and crews by the government authorities of flag of registry, let alone that some of the vessel registering countries may not strictly enforce vessel management and crew assessment. In light of above, sea-bordering countries have transplanted the flight control concept in vessel navigation management by having shore control personnel monitor vessel navigation using electronic and radar equipment. As a type of navigation aiding facilities, VTS is not only a stationary facility but one that is able to actively gather and transmit data, under controlled measures and procedural guidelines, positioning and monitoring system, together with the traffic separation scheme, would enable the shore control center a direct grasp on the status of all vessels in the nearby sea territories, and be able to assist vessels in steering clear of a collision crisis or dangerous sea territories. Many research reports have validated that VTS could indeed reduce 40% to 70% of maritime collision incidents.



海上與陸上交通秩序管理之比較

一般而言，陸上交通速度快、可視距離很近，駕駛人在危機發生時，能採取應變動作的時間非常緊迫，因此，陸上交通必須採取嚴格的強制性管理措施。海上交通以目視或藉助雷達觀測，從十浬外即能發現目標船舶，並因海面為一自由航行區域，且其交通密集程度不如陸上，故各國政府僅單就其港灣、航道等交通密集處進行海上交通管理。部份狹窄航道也會限定船速，禁止追越，並以時間區隔管制通行方向，都與陸上交通管理之理念相合。但是陸上交通管理在大多數的路面均有明確的車道與號誌控管，而海上交通之航道只顯示在海圖上，同時除了設立航道的區域外，並沒有明確規定交通流向與管制程序。

在海上交通秩序方面，因受「1982年聯合國海洋法公約」領海無害通過之保障，除非是異常的緊急事故，否則沿海國的執法人員無權要求航行中船舶停?並登輪檢查。有關船員及船舶各項證書檢查，係屬「港口國管制（Port State Control, PSC）」項目之一，應在港內由主管機關負責。由下表可清楚地顯示陸上與海上交通管理的差異。

A Comparison on the Administration of Land Versus Maritime Transportation

In general, as land transportation is fast and with close-range visual, leaving a driver very little time to respond if a crisis should occur. This has compelled land transportation to heed to strict mandatory management measures. Whereas with ocean surfaces being a broad free navigation area, and with a lesser transportation density compared to dry land, governments often impose maritime transportation management in heavy traffic areas of harbors and navigation courses. Some of the narrow navigation courses would come with restrictions of boat speed, prohibition against chasing and surpassing other vessel, and using time interval to segregate and control the direction of passing, which does coincide with the concept of land transportation management. However, unlike land transportation of which the majority of road surfaces are marked with traffic lines and traffic signals, navigation courses for maritime transportation are only charted in sea maps, and without any clear stipulation pertaining to the direction of traffic flow or control procedure in areas beyond the charted navigation courses.

In maritime transportation order, as protected by the “UN Maritime Law Convention of 1982”, unless in the face of exceptional emergency incidents, law enforcement officers from sea-bordering countries have no right to demand a navigating vessel to stop and receive onboard inspection. While as logistics concerning crew and vessel certification and inspection falls under one of the categories of the Port State Control (PSC), the port authorities are responsible for such measures within a jurisdictional harbor; the table below shows clearly the differences between land and maritime transportation management.



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陸上及海上交通秩序管理之比較		
	陸上交通	海上交通
行駛自由度	受限制	較為自由
最高速限	依道路環境分別作設定	除部分航道及港區外，均無限制
危機反應時間	數秒鐘，甚至違反射性動作	數分鐘至數十分鐘不等
載具國籍姓	本國籍或經許可之外籍車輛	國籍性的船舶，不需經由許可
管理強制性	在劃設道路區域為全面強制性	在各航道、港口、港灣及內水為強制性、其餘為自由航行區
主要法規	各國國內法	各國國內法、國際海上避碰原則、國際公約
行駛範圍	道路劃分清楚	航道看不見、僅顯示在海圖上
執法機關	警政單位	海岸巡防機關、各港口主管機關
執行設備	標線、標誌、號誌、開道儀控、照相攝影等	VTS之雷達監測及紀錄、信號台等

A comparison of land transportation vs. maritime transportation administration		
	Land transportation	Maritime transportation
Freedom to move	Restricted	Relatively free
Maximum speed limit	Stipulated as per roadway conditions	No limitation except some of the navigation routes and harbor areas
Crisis response time	A few seconds, or even reflective movements	Varying from a few minutes to tens of minutes
Nationality of the carrier	Locally licensed or foreign vehicles carrying a valid permit	International vessels are not required to secure a permit
Mandatory administration	Fully mandatory within zoned roadway areas	Mandatory at various navigation routes, harbors, harbor bays and inner waters, and the rest are free sailing areas
Main legal guideline	As per domestic law of a country	As per domestic law of a country, international maritime collision prevention rule and international treaties
Range of travel	Clearly defined roadway system	Invisible navigation routes, which are only marked on navigation maps
Law enforcement agency	Police administration unit	Coast guard agency, port authorities
Execution equipment	Marked lines, signage, traffic lights, gated instrument control, monitor cameras and so forth	VTS radar surveillance and recording, signal transmission stations and so forth



我國海上交通秩序之管理

我國維護海上交通秩序之法規制定及航道規畫係交通部之職責，海上交通監測則由海域執行公權力的機關負責，包括各港務局及海巡署。目前我國於基隆、台中、高雄三個港口之外海已設定航道，也在基隆及高雄設置 VTS，經由岸上雷達監測船舶在港外 20 浬範圍內之航行動向。我國對於船舶安全多著重於船舶檢查，對於船舶航行安全則甚少規範。關於最基本的「國際海上避碰規則」，我國並沒有任何一個法律明文引用，僅在「船員法」及「商港法」中提及航行避碰規定。此外，VTS 之相關規定因沒有母法，目前各港務局只以行政命令為之。為避免適法性之疑慮，交通部正在研擬「海上交通安全法」草案，正式將「國際海上避碰規則」、分道通航制、VTS 等加以國內法律化。

關於維護海上交通秩序之執法單位，在港區範圍之水域適用「商港法」，由港務局負責，其餘海域則由海巡署負責。基隆、高雄、台中三港因有分道通航制的設定，船舶航行必須受到約束，漁船也不得在航行巷道內任意捕魚作業或妨礙航道內航行船舶之安全。如有違規航行者，目前勉強可依「商港法」處罰，未來則適用「海上交通安全法」。基隆及高雄兩港 VTS 之監測紀錄，可作取締違規航行之證明，但也僅供事後處理，不可能要求違規船舶停止航行，現場進行檢查。至於在兩港航道內違規捕魚作業之漁船則須驅趕及取締，港務局公務船舶不能出海，期望由海巡署船舶協助執行。「商港法」中並沒有賦予海巡署在港區內之執法權利，可是海上交通秩序之維護又是

Taiwan's Administration on the Order of Maritime Transportation

The law drafting and navigation course planning for Taiwan's maritime transportation order management falls under the responsibility of the Ministry of Transportation and Communications, while maritime transportation monitoring falls under the jurisdiction of government authorities empowered to enforce public equity rights over jurisdictional sea territories, which comprise of various port authorities and the Coast Guard. At present, Taiwan has had navigation courses defined for the open seas of three seaports in Keelung, Taichung and Kaohsiung, with VTS installed at Keelung Port and Kaohsiung Port, where shore radars monitor the state of vessels navigation within a 20 nautical mile range. As to the most rudimentary "International Maritime Collision Prevention Rule", there has not been any clear excerpts made in Taiwan but rather with navigation collision prevention stipulations mentioned in the "Navigation Crew Administration Act" and the "Commercial Harbor Administration Act". Furthermore, for the lack of a legal base, presently the various harbor authorities have dealt with it through administrative orders; to alleviate concerns of its legality, the Ministry of Transportation and Communications is currently drafting a legislative bill – the "Maritime Transportation Security Law" to formally streamline the "Maritime Collision Rule" through local legalization of traffic separation system, the VTS and so forth.

As to the law enforcement unit responsible for maintaining maritime transportation order, of waters within a harbor area as governed by the "Commercial Harbor Administration Act", the port authorities are responsible for it, and the Coast Guard is responsible for the rest of the sea territories. With the presence of navigation lanes set up at the three harbors in Keelung, Kaohsiung and Taichung, vessel navigation is restricted, in that fishing vessels are banned from willfully fishing or obstructing the safety of vessel navigation in and around the navigation lanes. Navigators who violate the rule are at best subject to punitive action provided by the "Commercial



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海巡署之職責，因此，交通部與海巡署之間必須制定辦法，協調分工。港區之外的所有海域均是海巡署的執法範圍，可是維護海上交通秩序在此範圍內卻功能有限。因沒有設定航道，「國際海上避碰規則」所規定之避讓行為只是作為事故後賠償比例分攤的判定，任何國家均不能予以取締及處罰。因此，海巡署只能對於沒有依規定懸掛號燈或號標之船舶予以取締。

Harbor Administration Act”, and would eventually fall under the prohibitions of the “Maritime Transportation Safety Act”. VAT monitoring records kept by the Keelung Port and Kaohsiung Port can be utilized as proof in cracking down navigational violations, but rather as post-incident settlement, rather than to stop a vessel from navigating and have inspections conducted on scene. As to fishing vessels that engage in fishery catching act illegally in and around the navigation lanes at the two ports that are to be cracked down and chased after, as curtailed by the port authorities’ official coats are kept from taking to the sea, a viable solution would be for Coast Guard vessels to facilitate the execution. And given that the Coast Guard Administration has not been empowered in the “Commercial Harbor Administration Act” to carry out law enforcement within the harbor area, yet maintaining maritime transportation order is part of the Coast Guard’s responsibilities. There is a necessary that the Ministry of Transportation and Communications and the Coast Guard Administration would need to draft a set of measures with which to coordinate the task-sharing mission. In light of the Coast Guard Administration’s direct responsibility for law enforcement in all sea territories other than the harbor area, defining maritime transportation order administration in a narrow sense may not provide as much tangible yield. While the lack of navigation courses, the act of bypassing so stipulated in the “International Maritime Collision Prevention Rule” had intended for assessing the division of compensation following a maritime incident, while no country is permitted to execute crackdown or levy penalties. As a result, the Coast Guard Administration can only report vessels that fail to display navigation beacons or insignia markers.





結論

海上交通受到船舶性能之限制及航行自由的理念影響，秩序之維護與陸上交通相比，約束性較弱，一方面「國際海上避碰規則」多屬原則性之建議，另一方面蒐證取締困難。要想達到維護秩序之成效，必須有適當的國內法作為處罰之依據，並在設定航道的水域，利用 V T S 進行監測及紀錄。以海巡署之立場來看，所謂維護海上交通秩序，最多僅能取締在航道內違規捕魚之漁船，以及台灣領海以內未依規定懸掛號燈或號標之船舶而已。目前執法勉強適用「商港法」作為法源，未來必須及早完成「海上交通安全法」之立法程序，並賦予海巡署在港區內維護海上交通秩序之執行權利。（作者林彬任職於國立海洋大學商船學系副教授，黃志豪、楊啓宏為碩士班研究生）

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Conclusion

As steered by restrictions in vessel functionality and the concept of freedom to navigate, the maintenance of maritime transportation order is infinitely less restrictive when compared with that for land transportation, in that the “International Maritime Collision Prevention Rule” has intended as a principle recommendation on the one hand, and difficulties in gathering factual evidence for crackdown purposes on the other. In order to realize order maintenance yield, there is a necessary to legislate an adequate domestic law to serve as the basis in issuing corrective action, and to facilitate VTS monitoring and documenting in and around waters with navigation lanes defined. To gauge from the Coast Guard Administration’s standpoint, the very essence of maintaining maritime transportation order at best entails reporting fishing vessels that fish illegally in and around the navigation lanes, and those failing to display navigation beacons and insignias within Taiwan’s sea territories. At the present time, the “Commercial Harbor Administration Act” continues to serve as the legal basis at its best, whereas for the future, the legislative proceeding for a “Maritime transportation safety act” ought to be completed as timely as possible, and to empower the Coast Guard Administration the right to enforce the maintaining of maritime transportation order in and around the harbor area.

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