Karataş, H., Boran, M. (2024). Analysis of Deck Deficiency of Ships Detained under the Black Sea Memorandum. *The Black Sea Journal of Sciences*, 14(2), 891-901.

The Black Sea Journal of Sciences, 14(2), 891-901, 2024. DOI: 10.31466/kfbd.1446946

KFBD

Karadeniz Fen Bilimleri Dergisi
The Black Sea Journal of Sciences
ISSN (Online): 2564-7377 https://dergipark.org.tr/tr/pub/kfbd

Araştırma Makalesi / Research Article

Analysis of Deck Deficiency of Ships Detained under the Black Sea Memorandum

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Abstract

The most common mode of international transport is by sea, which carries some inherent risks. In the global economy, 90% of goods are transported by sea. Port State Control ensures safety at sea, prevents ship pollution, enforces stricter rules for living and working conditions on board, and prevents the transport of substandard ships that don't comply with international maritime regulations. This study has established a correlation between the deck department deficiencies of detained vessels resulting from port state control inspections under the purview of the Black Sea Memorandum and the ship flags, ages, gross tonnages, types, classification societies, and inspecting countries. Within the scope of the research, the findings of the vessels detained between 2016 and 2018 were taken from the Black Sea Memorandum website. IBM SPSS Statistics 23 software has been used to evaluate the data. The research has discovered statistically significant relationships between detention reasons for ships due to deck deficiencies and various factors, such as ship type, age, flag, gross tonnage, classification society, and detaining country. The research results will guide seafarers, port and flag state control officers, and ship-owners in preventing maritime accidents and ship detentions.

Keywords: Black Sea MoU, Ship detentions, Port state control.

Karadeniz Memorandumu Kapsamında Tutulan Gemilerin Güverte Bulgularının Analizi

Öz

Deniz taşımacılığı uluslararası nakliyatta en yaygın kullanılan kendine ait bazı riskleri olan bir taşımacılık türüdür. Dünya ticaretinde taşınan malların yaklaşık %90'nı deniz yolu ile taşınmaktadır. Denizde can ve mal emniyeti, gemilerden kaynaklanan kirliliğin önlenmesi, gemide yaşam ve çalışma koşullarının iyileştirilmesine ilişkin daha katı kuralların uygulanması ve uluslararası denizcilik düzenlemelerine uymayan standart altı gemiler ile taşımacılığın önüne geçilmesi için oluşturulmuş denetleme mekanizmalarından biri de Liman Devleti Kontrolüdür. Bu çalışma ile Karadeniz Memorandumu kapsamında yapılan liman devleti denetimleri sonucu tutulan gemilerin, güverte eksikliklerinden kaynaklı tutulma nedenleri ile gemi bayrağı, gemi yaşı, grostonu, gemi tipi, klas kuruluşu ve denetim yapılan ülke arasındaki ilişki belirlenmiştir. Araştırma kapsamında 2016-2018 yılları arasında tutuklanan gemilere ait tutulma bilgileri Karadeniz Memorandumu web sayfasından alınmıştır. Verilerin değerlendirilmesi için IBM SPSS istatistik 23 programı kullanılmıştır. Araştırma sonucunda, tutuklanan gemilerin, güverte eksikliklerinden kaynaklı tutulma nedenleri ile gemi bayrağı, gemi yaşı, grostonu, gemi tipi, klas kuruluşu ve denetim yapılan ülke arasında ilişkinin anlamlı olduğu belirlenmiştir. Araştırma sonuçlarının, gemi insanları, liman ve bayrak devleti denetçileri ve gemi donatanları için deniz kazalarının ve gemilerin tutulmasının önlenmesi açısından yol gösterici olacağı düşünülmektedir.

Anahtar kelimeler: Karadeniz Memorandumu, Gemi Tutulmaları, Liman Devleti Denetimleri.

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Geliş/Received: 05.03.2024 **Kabul/Accepted:** 06.06.2024 **Yayın/Published:** 18.06.2024

1. Introduction

The first international study on maritime safety was conducted in 1914 after the Titanic disaster. These studies are constantly updated and developed in line with developing technological advances and demands. In order to carry out the work in a more organized manner, it was decided to establish the International Maritime Organization (IMO) in 1948. The first official meeting of the International Maritime Organization was held in 1959 (URL-1). Türkiye became a member of the International Maritime Organization in 1958 and started to implement and legalize the advisory decisions given by IMO according to the current conditions.

Port State Control (PSC) is the inspection of foreign ships in national ports, which effectively contributes to maritime safety and environmental protection. The ships have to meet both flag state requirements and international regulations. PSC inspection is the second line of defense against marine accidents and environmental contamination in the maritime domain, following flag state oversight. The PSC Memorandum of Understandings (MoUs) has allowed port governments to play a major role in ensuring that ships adhere to International Maritime Organization regulations. The Black Sea MoU, signed by the States bordering the Black Sea in 2000, assigns the supervision of inspections in this region. The memorandum states that each national authority will establish and maintain an effective structure for port state control to ensure that foreign merchant ships leaving its national ports comply with the regulations without posing a unique risk to any flag (Karataş, 2020; URL-2).

Several studies on various aspects of port state control have been conducted (Li and Wonham, 1999; Cariou and Wolf, 2015; Karataş, 2020; Çelik and Çakır, 2023). The several investigations concentrate on the ship-related elements found in the body of literature that could result in detention. In addition to ship age, ship type and flag are significant factors in detentions (Cariou et al., 2008). The type of ship, the flag state's performance, and the quantity of faults are the main causes of detentions (Xiao et al., 2020). In a study, it was concluded that Korean flagged ships were frequently detained as a result of PSC inspections due to their deficiencies. Within the scope of this research, it was observed that a higher rate of detention (44.2%) occurred in ships in the 20-25 age group. It was determined that the most deficiencies in the ships detained were about fire safety, lifesaving equipment and ship structure, respectively (Kim and Kong, 2008). 29,954 PSC inspections of foreign ships in countries covered by the Black Sea Memorandum between 2012 and 2017 were analyzed. The inspections revealed that the age of the ship was the primary reason for detention (Şanlıer, 2019).

In this research, the detention incidents recorded due to deficiencies on deck findings identified in the inspections carried out by the countries on the Black Sea between 2016 and 2018 were

examined, and the relations between the detentions and variables such as flag, age, gross tonnage, type, class of the ships and country that decided to detained it, were statistically analyzed.

2. Materials and Methods

Data regarding ship detentions taken from the Black Sea MoU official website and covering the years 2016-2018, were used in this study.

2.1. Study Variables That Were Used

The independent variables of the study include the ship's flag, age, gross tonnage type, classification society, and the country that carried out the detention. The dependent variables of the study are the reasons for detention that concern the deck department. The reasons for detention originating from the deck deficiencies within the scope of the Black Sea Memorandum are Certification and Documentation (CD), Structural Conditions (SC), Water/Weathertight (WW), Emergency Systems (ES), Radio Communication (RC), Cargo Operations (CO), Fire Safety (FS), Alarms (AL), Working and Living Conditions (WLC), Safety of Navigation (SN), Lifesaving Appliances (LSA), Dangerous Goods (DG), Pollution Prevention (PP), International Safety Management Code (ISM), Labour Conditions (LC), Others (O).

2.2. Evaluation of Data

In this study, the Kruskal-Wallis test was used because there were more than two groups in the independent variables of the applied analyses (Kruskal, 1952). The chi-square and p-value were examined as a consequence of these tests to determine whether there was a significant association between the variables. Since the significance value of the analyses was taken as 95%, a p-value below 0.05 was considered statistically significant in the results. The Chi-square value was checked by looking at the Chi-square table. If the value obtained as a result of the analysis is greater than the value in the table, it is considered that the relationships between the variables are statistically significant (Sümbüloğlu and Sümbüloğlu, 1995).

3. Findings and Discussion

The deck findings of the ships detained as a result of the PSC inspections carried out between 2016 and 2018 in the Black Sea Region countries and the distribution of these findings according to

the flags of the ships are shown in Table 1. The number of ships stated in the last column includes detentions of the same ship under different flags.

Table 1. The distribution of reasons for detentions according to ship's flag

	Detention Deficiencies*																	
Countries	CD	SC	WW	ES	RC	CO	FS	AL	WLC	SN	LSA	DG	PP	ISM	LC	O	Total Reasons	Number of Ships
Antigua & Bar.	1	1	1	-	3	-	2	-	-	2	5	-	-	3	1	-	19	10
Vanuatu	1	2	1	3	4	-	7	-	-	3	5	-	-	4	1	-	31	9
Ukraine	1	2	5	1	1	1	4	-	-	7	3	-	-	5	5	-	35	8
Türkiye	6	5	4	10	3	1	14	1	2	17	16	-	-	10	1	-	90	41
Tanzania	29	14	8	13	12	1	18	1	8	27	20	1	-	15	5	-	172	33
Sierra Leone	13	1	6	3	5	1	11	-	-	27	24	-	-	14	4	-	109	30
Russia	6	6	9	9	4	1	5	-	1	19	6	-	-	12	1	-	79	25
Panama	37	14	15	27	22	1	62	3	6	80	72	1	-	26	14	-	380	109
Palau	6	1	6	7	1	-	13	1	-	9	10	-	-	8	3	-	65	15
Mongolia	4	4	3	-	-	-	4	-	1	1	1	1	-	1	-	-	20	5
Moldova	29	14	7	9	10	1	18	4	4	39	27	-	2	14	5	1	184	36
Marshall Islands	1	-	-	3	-	-	6	-	-	6	7	-	-	3	-	-	26	18
Malta	1	1	3	2	-	-	6	1	-	7	9	-	-	4	2	-	36	22
Liberia	-	-	2	1	-	-	8	-	1	3	12	-	-	2	3	-	32	20
Italy	-	-	-	1	-	1	1	-	-	2	4	-	-	2	1	-	12	8
Cook Islands	5	2	3	4	3		9	-	2	16	11	-	-	11	5	-	71	21
Congo	1	1	1	-	-	-	5	-	1	3	6	-	-	2	-	-	20	7
Comoros	11	5	7	3	10	1	18	-	2	20	19	-	-	9	5	-	110	29
Cambodia	9	2	2	4	5	-	3	-	1	3	6	-	-	2	-	-	37	6
Belize	6	4	3	4	6	-	5	1	1	8	8	-	-	5	2	-	53	17
Togo	24	10	10	10	7	-	27	-	1	31	18	-	-	17	8	-	163	36
Total	191	89	96	114	96	9	246	12	31	330	289	3	2	169	66	1	1 744	505

*Certification and Documentation (CD), Structural Conditions (SC), Water/Weathertight (WW), Emergency Systems (ES), Radio Communication (RC), Cargo Operations (CO), Fire Safety (FS), Alarms (AL), Working and Living Conditions (WLC), Safety of Navigation (SN), Lifesaving Appliances (LSA), Dangerous Goods (DG), Pollution Prevention (PP), International Safety Management Code (ISM), Labour Conditions (LC), Others (O).

When the data specified in Table 1 is analysed, it is observed that, based on deficiencies in deck findings detained in the Black Sea region between 2016-2018, excluding ships from countries that experienced 10 or fewer detentions, 1744 deficiencies were identified on 505 different ships out of 16 deck finding control variables. While it was determined that 8 different ships with the Italian flag, to which the least detention clause was applied, were detained with 12 deficiencies, it was also determined that 380 different deficiencies were found in 109 different ships. Most of these were detected on Panama-flagged ships.

It has been determined that there is a statistically significant relationship between the detention deficiency and the flags of the ships inspected at the Black Sea Ports between 2016 and 2018 ($p < 0.05$). It was observed that 380 out of the 1854 deficiencies were determined in Panama, while 184 were in Moldova and 172 in Tanzanian-flagged ships. On average, the majority of the defects that result in the detention of examined ships fall within the categories of lifesaving appliances and navigational safety. The most frequently identified deficiencies regarding navigational safety include

lights, daytime signals and sound signals, navigational publications and maps. It has been determined that the most common reasons for detention within the scope of the lifesaving equipment article are lifeboats, rescue boats and the stowage of rescue boats. Panama flagged ships were mostly detained within the scope of the Black Sea MoU between 2006 and 2012 (Mert, 2014). According to engine department findings within the scope of the Black Sea MoU, Panama flagged were detained the most (Uçar and Boran, 2023).

The number of detentions of ships according to their age ranges and the distribution of these detentions according to the inspected issues are shown in Table 2.

Table 2. Distribution of detention items according to the ages of ships between 2016 and 2018

	Detention Deficiencies *																	
Ship Age	CD	SC	WW	ES	FO	CO	FA	AL	WLC	SN	LSA	DG	PP	ISM	LC	O	Total Reasons	Number of Ships
0-10	4	-	2	9	2	-	10	1	-	18	29	-	-	13	3	-	91	51
11-20	17	4	6	19	11	2	35	-	2	46	58	1	-	26	13	-	240	114
21-30	35	17	18	19	25	3	56	2	4	70	67	-	-	36	12	-	364	127
31-40	95	41	47	46	43	1	95	6	12	136	112	1	2	70	26	1	734	171
41+	49	32	26	26	23	3	59	5	14	72	59	2	-	35	20	-	425	95
Total	200	94	99	119	104	9	255	14	32	342	325	4	2	180	74	1	1.854	558

*Certification and Documentation (CD), Structural Conditions (SC), Water/Weathertight (WW), Emergency Systems (ES), Radio Communication (RC), Cargo Operations (CO), Fire Safety (FS), Alarms (AL), Working and Living Conditions (WLC), Safety of Navigation (SN), Lifesaving Appliances (LSA), Dangerous Goods (DG), Pollution Prevention (PP), International Safety Management Code (ISM), Labour Conditions (LC), Others (O).

It was determined that the most detention occurred in 171 different ships belonging to the age range of 31-40. The least detention occurred on 51 different ships between the ages of 0-10. In the study, as a result of the PSC inspections carried out on ships up to 30 years old, the deck department deficiencies that cause the most concern are the issues related to lifeboats, rescue boats, and ISM within the scope of the lifesaving appliances item. It was established that there was a statistically significant relationship between ship age and deficiencies that caused detention ($p<0.05$). Studies have demonstrated that the deficiencies identified in the detained ships were related to the ship flag, ship age, and ship type (Cariou et al., 2008). Cariou and Wolff (2015) determined that detention rates decrease as ship age decreases. In another research, it was discovered that accident probabilities vary according to ship types and ship age is important for the occurrence of very serious accidents (Knapp and Frances, 2007). In her study (Şanlıer, 2019), the age of the ship was determined to be the greatest factor in the detention of ships.

Among the 558 different ships at ports in the Black Sea Region between 2016 and 2018, 783 detention items were found for 186 ships of 3,000 gross tonnage and below, 757 detention items were found for 229 ships between 3,000 and 10,000 gross tonnage, and 314 detention items were found for 143 ships larger than 10,000 gross tonnage (Table 3).

Table 3. The number and distribution of detentions based on the gross tonnage of ships.

	Detention Deficiencies *																	
Gross Tonnage	CD	SC	WW	ES	RC	CO	FS	AL	WLC	SN	LSA	DG	PP	ISM	LC	O	Total Reason	Number of Ships
<3.001	108	51	54	49	49	5	102	5	21	121	105	3	2	79	28	1	783	186
3.000-10.000	73	34	34	36	39	3	113	9	7	162	144	-	-	67	36	-	757	229
>10.000	19	9	11	34	16	1	40	-	4	59	76	1	-	34	10	-	314	143
Total	200	94	99	119	104	9	255	14	32	342	325	4	2	180	74	1	1.854	558

*Certification and Documentation (CD), Structural Conditions (SC), Water/Weathertight (WW), Emergency Systems (ES), Radio Communication (RC), Cargo Operations (CO), Fire Safety (FS), Alarms (AL), Working and Living Conditions (WLC), Safety of Navigation (SN), Lifesaving Appliances (LSA), Dangerous Goods (DG), Pollution Prevention (PP), International Safety Management Code (ISM), Labour Conditions (LC), Others (O).

It has been determined that there is a statistically significant relationship between ship gross tonnage and deficiencies identified in detention items ($p<0.05$). Detention of ships with a gross tonnage below 3,000 commonly includes deficiencies identified in the charts and navigation publications within the scope of ISM and navigation safety. It has been found that issues such as lifeboats, ISM, lights, daytime signals and, sound signals, navigational safety are the most frequently identified deficiencies for ships between 3,000 and 10,000 gross tons. In a study carried out by Mert (2014), it was established that ship detention and ship accidents are related to criteria such as the type, age, and gross tonnages of the ship.

In the statistical test (Chi-square) performed to determine whether there is a relationship between ship types and the reasons for detention, it was determined that there was a significant relationship between these variables ($p < 0.05$). When looking at the distribution of ships detained according to their types, it was determined that general cargo ships were detained (340) the most. While this was followed by bulk carriers with 125 ships, it was found that the least detention occurred in container ships with 12 ships (Table 4). Different ship types were detained for different reasons.

Table 4. Reasons and numbers of detention according to ship type

	Detention Deficiencies *																	
Type of Ship	CD	SC	WW	ES	RC	CO	FS	AL	WLC	SN	LSA	DG	PP	ISM	LC	O	Total Reason	Number of Ship
Container	-	1	2	-	-	-	5	1	-	4	4	-	-	2	-	-	19	12
Tanker	11	7	4	3	2	2	10	-	1	18	17	-	-	7	4	-	86	40
Ro-Ro	9	11	6	4	3	2	12	-	2	10	11	-	-	5	5	-	80	20
Bulk	18	6	11	25	13	-	39	1	3	57	82	-	-	28	9	-	292	125
General cargo	151	67	73	78	76	5	179	11	23	233	203	4	2	126	55	1	1.287	340
Others	11	2	3	9	10	-	10	1	3	20	8	-	-	12	1	-	90	21
Total	200	94	99	119	104	9	255	14	32	342	325	4	2	180	74	1	1.854	558

*Certification and Documentation (CD), Structural Conditions (SC), Water/Weathertight (WW), Emergency Systems (ES), Radio Communication (RC), Cargo Operations (CO), Fire Safety (FS), Alarms (AL), Working and Living Conditions (WLC), Safety of Navigation (SN), Lifesaving Appliances (LSA), Dangerous Goods (DG), Pollution Prevention (PP), International Safety Management Code (ISM), Labour Conditions (LC), Others (O).

Classification societies are independent organizations that inspect and monitor ships in order to meet the minimum safety requirements of ships, ensure their technical suitability and durability, prevent environmental pollution and ensure health issues (URL-3). Table 5 provides the distribution of the ships examined and detained within the scope of this study according to their classification societies and the numbers of the deficiencies that caused their detention. Total written under 10 items are not included in the Table. According to the classification societies, the ships classified by the Japanese Classification Society (Class NK) were the most frequently detained. 56 defective deficiencies in the 23 ships classified by Turkish Lloyd were found.

Table 5. Distribution of detention deficiencies according to ships' classification societies

	Detention Deficiencies *																	
Classification Societies	CD	SC	WW	ES	RC	CO	FS	AL	WLC	SN	LSA	DG	PP	ISM	LC	O	Total Reason	Number of Ships
American Bureau of Shipping	1	1	0	2	1	0	2	0	0	3	5	0	0	3	1	0	19	11
Turkish Lloyd	4	3	1	3	3	1	8	1	0	10	12	0	0	8	2	0	56	23
Shipping Register of Ukraine	16	10	12	6	7	1	26	0	3	19	19	0	0	12	8	0	139	31
Russian Mar. Reg. of Ship.	13	9	13	15	8	1	17	0	3	31	16	0	0	21	3	0	150	51
RINA Services S.p.A.	2	1	0	3	2	0	5	1	0	14	18	0	0	4	1	0	51	24
Polski Rejestr Statkow	3	2	4	3	0	0	9	0	0	17	15	0	0	5	3	0	61	16
Phoenix Register of Shipping	12	8	7	3	8	0	12	2	3	21	14	0	0	6	5	0	101	20
Panama Mar. Doc. Services	0	0	3	0	1	0	4	1	0	2	3	0	0	0	1	0	15	2
Overseas Marine Cert. Services	3	0	1	1	4	0	0	0	1	3	1	0	0	1	0	0	15	2
Venezuelan Reg. of Ship.	2	2	3	4	2	0	4	0	2	9	8	0	0	4	3	0	43	13
Indian Register of Shipping	2	1	0	0	0	1	3	0	0	2	6	0	0	0	0	0	15	6
Int. Naval Surveys Bureau	3	3	2	3	7	0	13	1	1	11	3	0	0	6	4	0	57	17
Int. Register of Shipping	4	2	1	3	0	0	7	1	0	2	5	0	0	3	7	0	35	11
Isthmus Bureau of Shipping,	2	2	2	0	0	0	6	0	2	0	6	0	0	0	1	0	21	6
Korean Register of Shipping	1	0	0	0	0	0	3	0	0	0	5	0	0	0	1	0	10	6
Maritime Lloyd Ltd, Georgia	0	0	0	2	2	0	3	0	0	5	6	0	0	2	1	0	21	6
Maritime Lloyd	8	7	1	4	4	1	6	0	2	11	8	0	0	7	4	0	63	16
Maritime Bureau of Shipping	2	1	3	0	1	0	3	0	0	6	4	0	0	1	0	0	21	5
Nippon Kaiji Kyokai	20	9	7	22	12	0	33	0	1	41	40	0	0	22	6	0	213	90
Macosnar Corporation	2	2	1	2	1	0	8	0	1	7	6	0	0	2	1	0	33	5
Med. Shipping Register	2	3	1	1	3	1	2	0	1	3	6	0	0	1	1	0	25	6
National Shipping Adjuster Inc.	5	2	4	3	2	0	2	0	1	3	1	0	0	0	0	0	23	4
Lloyd's Register	1	0	2	2	1	0	4	0	0	3	12	0	0	4	3	0	32	19
Guardian Bureau of Shipping	2	0	0	2	1	0	0	0	0	2	2	0	0	1	0	0	10	1
Dromon Bureau of Shipping	17	3	8	6	6	1	19	0	0	34	21	0	0	17	3	0	135	37
DNV GL AS	3	0	0	1	1	0	4	1	1	7	16	1	0	3	0	0	38	21
Cosmos Marine Bureau Inc.	6	0	2	3	2	0	4	0	0	5	5	0	0	3	1	0	31	4
Columbus American Register	4	2	0	0	1	0	1	0	0	2	2	0	0	2	0	0	14	3
Bureau Veritas	8	3	4	7	9	1	13	1	0	27	25	0	0	13	9	0	120	59
Bulgarian Register of Shipping	18	7	2	10	8	0	13	2	3	20	15	0	2	14	3	1	118	23
ASIA Classification Society	2	2	2	0	1	0	2	0	0	1	4	0	0	3	0	0	17	2
Others	26	8	9	3	5	1	13	3	5	14	12	2	0	9	0	0	110	24

*Certification and Documentation (CD), Structural Conditions (SC), Water/Weathertight (WW), Emergency Systems (ES), Radio Communication (RC), Cargo Operations (CO), Fire Safety (FS), Alarms (AL), Working and Living Conditions (WLC), Safety of Navigation (SN), Lifesaving Appliances (LSA), Dangerous Goods (DG), Pollution Prevention (PP), International Safety Management Code (ISM), Labour Conditions (LC), Others (O).

It was determined that there was a statistically significant relationship between the classification societies and deficiencies that caused the detention of ships ($p<0.05$). Differences throughout the different PSC regimes are in particular the Paris MOU members' heightened focus on matters pertaining to safety, stability, or structure (Knapp and Velden, 2009).

The distribution of ships detained in the Port State Controls conducted between 2016 and 2018 at the ports of the countries in the Black Sea region, based on the countries inspected, is displayed in Table 6. Upon examining Table 6, the greatest number of deck deficiencies resulting in detention, totaling 608, was found in 278 ships visiting Russian ports. Romania follows this with 598 detention deficiencies that were found on 130 ships, while 154 detention deficiencies have been detected on 44 ships docked at Turkish ports (Table 6). It is seen that the most defective findings are applied in Bulgarian and Georgian ports for certificates and certification, in Romanian ports for navigational safety, and in Russian and Turkish ports for deficiencies related to life-saving appliances.

Table 6. Deficiency of detention according to the port states that carried out the detention

Country	Detention Deficiencies *																	
	CD	SC	WW	ES	RC	CO	FS	AL	WLC	SN	LSA	DG	PP	ISM	LC	O	Total Reason	Number of Ships
Türkiye	18	15	13	15	14	1	20		5	17	28	2	-	6	-	-	154	44
Russia	24	35	30	4	30	4	105	4	2	118	186	1	-	16	49	-	608	278
Georgia	41	2	4	2	7	-	13	8		23	22	-	2	22	-	1	147	54
Romania	67	13	27	98	36	-	49	1	10	146	39	-	-	107	5	-	598	130
Bulgaria	19	6	15	-	2	3	18	-	1	17	14	1	-	17	18	-	131	28
Ukraine	31	23	10	-	15	1	50	1	14	21	36	-	-	12	2	-	216	80
Total	200	94	99	119	104	9	255	14	32	342	325	4	2	180	74	1	1.854	614

*Certification and Documentation (CD), Structural Conditions (SC), Water/Weathertight (WW), Emergency Systems (ES), Radio Communication (RC), Cargo Operations (CO), Fire Safety (FS), Alarms (AL), Working and Living Conditions (WLC), Safety of Navigation (SN), Lifesaving Appliances (LSA), Dangerous Goods (DG), Pollution Prevention (PP), International Safety Management Code (ISM), Labour Conditions (LC), Others (O).

It seems that there are differences among port states based on the deficiencies that lead to detention. Bulgaria and Romania, the two European Union (EU) countries in the agreement, have different priorities than other countries and each other. It is thought that the differences between countries depend on the evaluation of the auditors conducting the audit, the existence of countries subject to more than one memorandum, and the implementation differences of extended audit campaigns on a country-by-country basis. In a study, the main factors causing retention are the age of the ship, the location where the inspection takes place, and the type of ship (Cariou et al., 2008). In another research, it was found that there are differences in approach among the countries that carry out inspections (Şanlıer, 2019).

4. Conclusions and Recommendations

Within the scope of the research, it was determined that there was a statistically significant relationship between the flags, ages, gross tonnages, types, classification societies of ships, countries of the ports where PSC is performed, and the deck department deficiencies that caused detention. It was observed that 109 of the 505 ships detained during the time period covered by this study were Panama-flagged, while 41 Turkish-flagged ships were detained due to deficiencies identified in a total of 90 items. It can be said that the widespread detention of Panama-flagged ships is due to the maritime authorities of other states accepting the extra privileges provided to these ships by the Panamanian State as a deficiency. It has been observed that the most deficiencies in navigational safety, lifesaving appliances, and fire safety items were identified in the ships that were detained as a result of PSC inspections at the ports of the Black Sea countries. When the distribution of the ships detained during the study period according to their ages was examined, it was determined that the most detentions were applied to the ships in the 31-40 age group, with 171, and the number of detentions decreased as the age of the ship decreased. In addition, it can be said that the reason for the detention being applied to 95 ships in the 41+ age group may be due to the low number of ships in this age group calling at the Black Sea Ports. According to the results obtained in the study, it was seen that the number of detentions was higher in ships of 3,000 gross tonnage and below. The most common consideration on these ships is navigational safety. When examining the relationship between ship type and the number of ships detained and the reasons for detention, it was determined that the most detentions were applied to general cargo ships, followed by bulk cargo ships. The most deficiencies were reported in navigational safety in both ship types. The number of ships detained varied according to ship classification societies. Most detentions were made on ships classified by the Nippon Kaiji Kyokai (NKK) in Black Sea ports.

There is a significant relationship between the countries that conduct PSC inspections and where detentions are made and the reasons for detention. The country that makes the most detentions is Russia, followed by Romania, Ukraine, Turkey, Georgia, and Bulgaria. There were differences among port states according to the deficiencies that cause detention. It has been determined that Bulgaria and Romania, the two EU countries in the Black Sea MoU, have different priorities compared to other countries and each other. The main reasons for detention in Bulgarian ports were ISM, water/weather tightness, and circuits within the scope of water and air tightness, and voyage planning within the scope of navigational safety. In Romanian ports, ISM, fire drills within the scope of emergency systems, and navigational publications within the scope of navigation safety were determined as the most common deficiencies. When these two countries are examined in detail, it is seen that both of them give priority to the Safe Management System compared to other countries.

The differences between countries depend on the evaluation of the auditors conducting the audit, the existence of countries subject to more than one memorandum, and the implementation differences of extended audit campaigns on a country basis.

Authors' Contributions

All authors contributed equally to the study.

Statement of Conflicts of Interest

There is no conflict of interest between the authors.

Statement of Research and Publication Ethics

The author declares that this study complies with Research and Publication Ethics.

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