Autoridad Marítima de Panamá
Dirección General de Marina Mercante
Departamento de Investigación de Accidentes Marítimos

Reporte

Fecha

M/V "VOLCAN DE TAHICHE"

IMO No.: 7615323

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NOTICES

Notice No. 1: This report consisting from 65 pages has been compiled by A.N.Arvanitakis – Principal Investigator appointed by PMA by virtue of 104-01-353-DGMM/DIAM dated 10 September 2010. All information included was collected either by verbal interview or by documentation which has been incorporated into this report and to the best of my knowledge believed to be correct but this is not guaranteed. This report was completed on 15/09/2011, in good faith and without any prejudice for all parties concerned.

Notice No. 2: This investigation report was written to improve safety and prevent possible accidents. The report does not address the possible responsibility or liability caused by the accident. The investigation report should not be used for purposes other than the improvement of safety.

SYNOPSIS

M/V "VOLCAN DE TAHICHE" is a typical RO-RO cargo ship built in 1979 at Vigo – Spain. At the time of the investigation, on 08th of September 2010, the vessel was in idle condition, moored in the port of Las Palmas at Gran Canarias. The vessel was under preparation for her forthcoming inspections by her classification society, Bureay Veritas. In the course of such preparation, vessel's Chief Officer, Mr. Orlando Mancebo Dilu, has instructed the AB, Mr. Alassane N'Diaye to open manholes of double bottom tank No.7 for ventilation well in advance of tank's inspection.

The said AB opened the manhole, as instructed, in the presence of Chief Officer but he entered also the tank without instruction to do so. When he entered the tank he felt unconscious in spite of Chief Officer's order to keep himself clear from entering the tank. In the development of the events, another AB, Mr. Mohamed Fall, who was in the vicinity, run immediately to assist his colleague and trying to get him out of the tank he felt also unconscious inside the tank.

In the urge situation that arose, Chief Officer called Emergency Service asking for help while the 2nd Engineer, Mr. Maximo Perdomo Hernandez who came on the scene, tried to assist the two AB but trying to enter the tank but he realized the risk and came out quickly thus saving actually himself. The two ABs were rescued by Fire Brigade Service and they were shifted to the hospital. The first AB, Mr. Alassane N'Diaye found dead while the second AB, Mr. Mohamed Fall was died a few hours later.

SOURCE OF INFORMATION

The sources of information used for this investigation, were:

1. Interviews of the staff related to the casualty conducted by the undersigned.

2. Review of official testimonies provided in copy.

3. Information provided by ship's documents & plans.

4. Physical examination of the site where the casualty took place, by the undersigned.

RESTRICTIONS

This investigation was carried out under the following restrictions:

1. No official post mortems of the two victims were provided, in spite of the repeated request of the undersigned through vessel's managers messrs Naviera Armas and the relative request of Panama Maritime Administration through Panamanian Consul in Las Palmas directly to the Judicial Authorities of Canary Islands.
2. The physical inspection of casualty site took place well after the casualty. So, there was no possibility to find or trace any element which could help the investigation.
3. All personal belongings of the two victims were already collected, so there was no any physical possibility for their inspection.
4. The conclusions included into this report are based on the analysis of the logical sequence of events according to the common sense and they cannot be justified by appropriate objective evidence like post mortems. Therefore, their expressions are based in good faith by the undersigned.

Chapter A – Factual Information

A1. Accident Summary

1	Name of the vessel	: VOLCAN DE TAHICHE
2	Flag	: PANAMA
3	Date of Casualty	: 08 SEPTEMBER 2010
4	Time of Casualty	: 08:200 LT
5	Position	: LAS PALMAS port – CANARY ISLANDS
6	Total Crew on board	: NINE (9)
7	Crew involved w Casualty	: CHIEF OFFICER / 2nd ENGINEER / 2 ABs
8	Total loss of Life	: TWO (2)
9	Rescued / Injured	: -
10	Owners	: NAVIERA ARECA S.A.
11	Management Company	: PALMERA SHIPPING CORPORATION-LAS PALMAS DE GRAND CANARIA
12	Classification Society	: BUREAU VERITAS
13	Class Notation	: I ✠HULL ✠MACH, ROLL ON ROLL OFF CARGO SHIP, UNRESTRICTED NAVIGATION
14	Other RO	: INTERNATIONAL REGISTER OF SHIPPING (IRS) - responsible for statutory certificates
15	Pollution	: NONE
16	Cargo	: NONE
17	Casualty related with	: HUMAN FACTOR / ENTRANCE INTO ENCLOSED SPACES

A2. Ship Details

IMO No	: 7615323
Former Names	: ISLA DE TENERIFE
Service	: Normal Registration - Unrestricted Navigation
Flag	: Panama
Call Sign	: 3EGB
Official No.	: 33067-07
Characteristic of Service	: GENERAL CARGO
Gross Tonnage	: 4,456
Net Tonnage	: 1,481
Length	: 101.50 m
LBP	: 90.00 m
Molded breath	: 16.50 m
Dead Weight	: -- MT
Summer Draught	: 5,450 mm

A3. Hull

Builder : Jiangnan Shipyard

Building Year : 1982

Building place : China

A4. Machinery

Type, Propulsion	: One Int. Comb. Diesel Engine / Single Screw
Year of built	: 1982
Manufacturer	: VEB Machinenbau
Power	: 9,000 bhp
Model	: K9Z60/105 – Serial No. 88

A5. Certificates and inspections

	Certificate	Issued by	Issuance	Expiration	Last Inspection
8.1	Certificate of Registry	PMA	08 May '08	07 May '12	-
8.2	Ship Station Licence	PMA	06 Dec. '07	05 Dec. '11	-
8.3	Minimum Safe Manning	PMA	14 Sept. '07	-	-
8.4	Continuous Synopsis Record	PMA	22 Sept. '08	-	-
8.5	Int'l Tonnage 1969	MACOSNAR	13 Feb. '08	-	-
8.6	Crew Accommodation	MACOSNAR	13 Feb. '08	13 Sept. '11	-
8.7	Load Line	MACOSNAR	01 July '08	22 Jan.'12	-
8.8	Safety Construction	MACOSNAR	01 July '08	22 Jan.'12	-
8.9	Safety Equipment	MACOSNAR	01 July '08	22 Jan.'12	-
8.10	Safety Radio	MACOSNAR	01 July '08	22 Jan.'12	-
8.11	IOPP	MACOSNAR	01 July '08	22 Jan.'12	-
8.12	Document of Compliance	MACOSNAR	27/09/2006	30/09/2011	-
8.13	Safety Management Cert.	MACOSNAR	23 Dec. '08	22 Jan. '12	-
8.14	Int'l Ship Security	PMA	30 Dec. '08	09 Feb. '13	-
8.15	Solid Bulk Cargoes	-	-	-	-
8.16	Sewage	-	-	-	-
8.17	Class	Bulgarian		08/10/2011	-
8.18	Last Dry dock	BV		10/2009	10/2006

A6. The crew / Workin Language

The crews onboard were of Cuban, Spanish & Mauritian nationalities. They were known each other as they were working for several years together in several employment periods.

It was reported that they had, in general, good communication and socialization. The working language on board was Spanish and all the crew was familiar to communicate with no communication issues.

Mauritanian people were Muslims and the period of the accident were running their Ramadan Festive thus they had special timing for their meals / lunches as per their tradition. That means no meals or lunches were taken before 20:00 o'clock. This particular detail may be contributed to the accident, as the physical strength and condition of the victims is questioned. It is a common sense that such kind of fasting may negatively affect normal physical performance under certain working conditions.

A7. Background

The vessel "VOLCAN DE TAHICHE" is a typical Ro-Ro cargo ship, built at Vigo –Spain on 1979. The general condition of the vessel at the time of inspection was satisfactory and the vessel was idle in Las Palmas port of Gran Canarias due to shortage of cargo in this particular period of time. Vessel's managers were enjoying a good reputation and the said vessel was operating for years with no problems or other casualty issues.

The vessel was classed by Bureau Veritas and all her statutory certificates were issued by International Register of Ships, on behalf of the Panama flag. All certificates were valid at the time of casualty, as per table in page (9).

The vessel was under preparation for her next special survey, so to estimate possible repairs required and finally to invite class / recognized organization's surveyors on board.

A8. Managing Company

The managers of the vessel are messes PALMERA SHIPPING CORPORATION and operate from the address DR.JUAN DOMINGUEZ PEREZ No.2 at LAS PALMAS de GRAN CANARIA, as per vessel's Safety Management Certificate.

It was understood that the said company is under the control of messes ARMAS NAVIERA based in Spain and they are enjoying a very good reputation in shipping business for several decades.

From the documentation that was reviewed during the course of investigation it was revealed that the managing company was maintaining a well established and efficient management system.

The safe management agreement between vessel's managers & owners is attached.

A9. Maintenance & Equipment

The vessel, even laid up, was in satisfactory condition with all her equipment in good working order including safety equipment. Anyhow, the casualty in consideration is not related whatsoever with vessel's status of maintenance and her equipment and therefore no further relation need to be investigated.

A10. Narrative

M/V "Volcan de Tahiche" is a typical Ro-Ro cargo ship, built in Spain at 1979, working under the Panamanian flag and managed by messes Palmera Shipping Corporation, a shipping company, based in Las Palmas. It appeared that this company is controlled by Armas Naviera, a maritime company based in Spain, with good reputation.

The casualty took place at 08 September 2010 at 08:20 local time. The vessel was idle in the port, moored to the dockside and preparation work for the forthcoming special survey was in process. Such preparation was including the opening of all manholes in double bottom tanks for ventilation purposes well prior the survey.

A11. The Casualty

The casualty took place in the entrance of double bottom tank No. 7. The first victim, AB Alassane N'Diaye was instructed by C/O, Mr. Orlando Mancebo Dilu, at 08:00 lt to open the manholes of double bottom tank No. 7 for ventilation purposes. Upon opening the tank, as reported, the AB entered with a torch light inside the tank to take a quick look of the situation and he said that there is a strong smell coming from inside the tank. The C/O asked him to come out as there was no any order to go inside, however it seems that AB lost his conscious prior coming out of the tank. Another AB, Mohamed Fall, who was close to the accident scene, came to assist in order to rescue the first AB but in vain, as he lost his conscious too.

It should be mentioned that the said double bottom tank has a height of only 1.20m that means an ordinary man could stay upright entering the tank with the upper part of the body still outside of the tank. Trying to understand the physical sequence of events, the undersigned entered the tank in order to realize the actual conditions that lead to this tragic accident. So, it seems that the AB in order to enter the tank had to bend his knees otherwise he could not put all his body inside and see around. Doing so, he felt the strong smell and he lost his conscious. After that, it was really very hard to rescue him, as the space was extremely confined and the only way to pull his body out could be only with the assistance of someone who should be also from inside the tank. Thinking that the manhole has a clear opening 600mm X 400mm it is obvious that since the AB was trapped unconscious just under the manhole and the double bottom tank has only 1200 mm height, **it seems that was almost impossible to pull him out without help from inside the tank.**

The second AB, who died also, tried to do exactly this, entering the tank in spite of the opposite order of C/O. It was reported that both victims were of the same nationality and religion thus they had a good social relation, so we could consider that the second AB acting under a strong emotional stress he didn't think about the risk for himself and tried to help the first AB but in vain.

As stated by the C/O, the first AB Alassane N' Diaye, entered the tank without having such an order as the purpose of the job was only to open the tank for ventilation and not to enter

inside. So, the question "why he entered the tank?" remains without reply and only assumptions can be made. As stated by C/O, AB Alassane N' Diaye had, often, a risky behavior performing his job and he was criticized for this.

In fact, at the time of casualty only C/O Orlando Mancebo Dilu and AB Alassane N'Diaye were together, so the only source of information is the statement and interview taken from C/O. Certainly, in the information provided remains a non-replied question "Why AB Alassane N'Diaye entered the tank while his order was just to open the manhole?"

C/O was not able to clarify this questionable point and as per his opinion AB entered the tank by his own motivation ignoring basic safety procedures regarding the entrance to enclosed spaces. As per C/O opinion this could be explained only by the risky behavior of the AB who underestimated any possible risk entering to a tank with a depth of no more than 1.2 m and his physical motivation for a productive work on board.

The second AB Mohamed Fall, acting in a totally compulsive and emotional way tried to help and somehow entered the tank and felt unconscious as well. The C/O recalling the consequence of events was not able to provide more details on the way that the second AB found unconscious, due to his emotional stress. C/O certainly acted in a much more precaution way and saved himself.

Under such development, C/O using his mobile phone called for assistance the Fire Brigade service and initiated a professional rescue operation.

The sequence of events is well described into his official statement given to the authorities. Such statement (in Spanish language, is attached to this document.

Chapter B – ANALYSIS

B1. The Accident

From a technical point of view, **it is hard someone to realize that two people lost their lives just entering inside such a shallow double bottom tank with depth of 1.20m**. A general arrangement plan of the vessel along with relative photos is attached for a better understanding of the casualty scene.

In fact this tank, as reported, was closed / sealed for several months and all this period was kept empty/dry as it was not used for ballast operation. The tank was not coated and all internal structure appeared to be rusty. The rust is actually a chemical reaction between steel and oxygen known as oxidation. In the process of this chemical reaction the oxygen from the surrounding air is gradually depleted, so we may safely conclude that at the time of manhole's opening there was no oxygen inside the tank or it was in extremely low level and certainly below human's survival critical level. **The strong smell could be justified from the degraded atmosphere inside the tank** due to the above mentioned chemical reaction. At the time of casualty investigation **was not possible to verify if there was any other contamination or pollutant factor, or poisonous gas inside the tank as the space was already ventilated.**

Unfortunately, was not possible to get any postmortem to see the exact cause of death but possibly, **it seems** that the victims suffered from *rapid hypoxia**. **The undersigned has not medical knowledge and such opinion is just an assumption based on a logical analysis with common sense , so cannot be construed as official statement of cause of death for any purpose.**

* (medical term from *http://en.wikipedia.org/wiki/Hypoxia_(medical)*)

B2. Actions taken by the crew

Apart from the two victims, the people involved into this accident, were:

1. Chief Officer, Mr. Orlando Mancebo Dilu
2. 2nd Engineer, Mr. Maximo Perdomo Hernandez

- C/O was attending the A/B Alassane N'Diaye and it remains unclear why the AB entered the tank while C/O stated that he instructed AB to keep himself outside the tank.
- AB Mohamed Fall was in the vicinity and he tried to assist but he failed to do so and felt unconscious as well inside the tank.
- 2nd Engineer, Mr. Maximo Perdomo Hernandez was the next person that came to assist but realizing the risk he didn't entered the tank, thus saving actually him.
- C/O after all, called Rescue Service which seems that responded quickly and rescued the two Abs and picked up them to the hospital.

B3. Events Failures

1. The first critical event failure was the initiative of AB Alassane N'Diaye to enter the double bottom tank without authorization to do so.

2. The second critical failure is the fact that the AB Alassane N'Diaye entered the tank just after its opening without waiting even for a while in order to allow some ventilation.

3. The third critical failure related with the behavior of second AB Mohamed Fall, who acted totally under emotional stress without any sense of logic trying to assist his colleague. Obviously he didn't realized the risk to suffer the same consequences like his colleague, while if she had the precaution, at least, to seek and use an EBBD device then maybe he would save himself and his colleague.

4. It is not clear for how long this series of events lasted. Certainly the time was short but this is a variable parameter which remains unclear. If C/O Mr. Orlando Mancebo Dilu and after him the 2nd Engineer, Mr. Maximo Perdomo Hernandez were more calm and were able to analyze the situation maybe would be able to handle the casualty in a more appropriate way, i.e. they could bring EBBP units to support somebody to enter the tank and / or to support the breadth of unconscious AB. However, nobody can be blamed for this, as the developed casualty was extraordinary, rapidly developed in a very constraint place with no ability to exercise a normal rescue operation. Both C/O & 2nd engineer declared that they were much stressed and they found as the most appropriate action to call Rescue Service from outside. It should be mentioned that even in the time of their interview; they were much stressed emotionally and excited recalling the recent casualty events.

CHAPTER C – CONCLUSIONS

1. The casualty occurred due to non compliance with the established procedures and guidelines regarding the ***entrance into enclosed spaces***. Managing company of the vessel had well established and documented such procedure (attached). If AB Alassane N'Diaye & AB Mohamed Fall had respect and implement such procedure would have save their lives.

2. This failure is, unfortunately, a common cause of marine accidents, where the risk to enter an enclosed space without prior ventilation, is always underestimated by the human nature and it is surprising how quickly such accidents may developed with tragic results.

3. It is really, very remarkable that, this casualty happened in spite of a well established and implemented safety management system involving crew personnel with good familiarization records, previous working history under the same managers, seaman's experience and a good working knowledge as revealed from the interviews.

4. However, even all precautionary and preventing procedural measures were in place, it was sufficient that AB's risky behavior resulted to his own death and to the death of his colleague who also acted emotionally and without thinking in a reasonable way to protect, firstly, himself and then to assist his colleague.

CHAPTER D - RECOMMENDATIONS

It is evidenced that human nature and behavior was quite strong in order to produce a series of fault decisions which led to this accident.

It was evidenced also that all preventing procedural measures, as per ISM code, were in place and it seems that they were well implemented based on the documentation review of vessel's SMS and employing history of the two Abs.

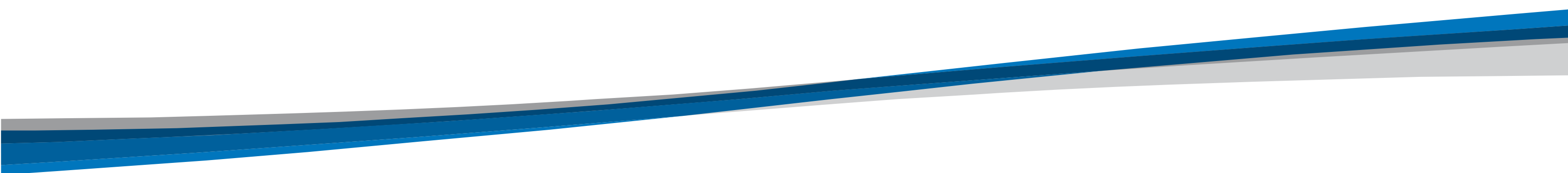
So, it is obvious that even all factors regarding the avoidance of the accident were quite strong, the accident happened. It is the opinion and recommendation of the undersigned that additional safety drills should become mandatory with respect to basic rescue operations on board a ship. If the rest of the crew was trained to handle such an emergency scenario, then this accident could be avoided.

On top of the above, it is recommended to maintain a continuous awareness of the crew members on the established safety issues during the safety minutes on board, especially on these areas where the human behavior may be critical due to the prevailing circumstances.

CHAPTER F – SUPPORTING DOCUMENTS

(ISM FAMILIARIZATION FORMS, EMPLOYMENT CONTRACTS,G/A PLAN)

Autoridad Marítima de Panamá



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