

一、概述 General Description

1. 船名:Shipname: “阿尔玛” M/V ALMA

2. 船东:Owner: _____

3. 船级社:Classification: KR

4. 主尺度 Main particulars after conversion:

总长 Length o. a. : 96.788 m

垂线间长 Length p. p. : 89.50 m

型宽 Breadth moulded: 18.00 m

型深 Depth moulded(to upper deck): 12.70 m

型深 Depth moulded(to 2nd deck): 7.75 m

设计吃水 Draught Design: 8.313 m

二、试验目的与参加人员 INTENTION AND ATTENDANCE:

1. 倾斜试验的目的是决定船舶的重量, 垂向和纵向的重心位置

The intention of the inclining test is to get the lightweight, vertical and longitudinal center of gravity of the vessel.

2. 参加人员 Attendance group of shipyard

总负责 General in charge: 程家元 (Cheng jiayuan)

成员 Members: 刘小军(Liu xiaojun)、蔡明汉(Cai minghan)、候安宝(Hou anbao)、吴满贤(Wu manxian)、汪刚(Wang gang)、罗荣(Luo rong)、骆丽君(Luo lijun)、余群力(She qunli) 及相关人员等 16 人。(参加人员均需带对讲机和 1 套备用电池)

4. 船东 Attendance owner Representative: Mr. _____

5. 船级社 Attendance KR Surveyor: Mr. Yoon Boo-Geun

6. 倾斜试验的整个过程应在验船师和船东代表的现场监督下进行。

The inclining test shall be carried out in the presence of Representative of KR Surveyor and Owner's supervisor.

三、试验地点 Place of test:

倾斜试验地点选在友联船厂码头附近的港池内, 读数的一段时间船应离开码头一定距离处于自由状态。为了防止船处于自由状态读数的一段时间与码头相撞, 在整个试验过程中用 1 条拖轮对船进行保护。

The test to be carried out at the site of Yiu Lian shipyard pool nearby wharf. The ship should be off wharf a suitable distance to keep ship free during pendulum reading. One tug boat to be used for safety purpose.

四、试验应具备的条件 General condition for test :

1. 船舶应尽可能达到修理完工空船条件。试验前友联参加人员应准备重量表, 包括多余重量、不在原位重量和不足重量及其重心. 并提交 KR 验船师和船东代表逐项核查(多余重量要求上船检查)。

The vessel should be as near complete repair as possible and the attendance group of shipyard should prepare the lists of foreign weights, mislocated weights, missing weights and their center of gravity before the test. Submit the lists to KR Surveyor and owner's supervisor for review and inspection (all foreign weights to be inspected on board)

2. 船上应清扫干净. 施工设备, 脚手架和杂物, 污水应当清除.

All the unnecessary temporary equipment, staging and other mess, bilge water should be cleaned.

3. 悬挂重量包括吊机、救生艇和吊艇架等应置于航行位置. 所有不能准确测量重量和重心位置的物品应在倾斜试验前安装好.

All suspended weights include crane lifeboat and the boat davit should be in seagoing position, and all items, whose weight and COG can't be calculated accurately, must be fitted before inclining test.

4. 除与试验有关的人员外其余任何人都应下船, 参与倾斜试验的人员都应经验船师确认. 船上所有人员不允许随意走动, 登船人数应尽量少.

All persons should be off the vessel except those who are related to the test, and all the related person should be approval by the KR surveyor. All personnel onboard are not allowed to move while the test is carrying out, personnel is to be kept to minimum number required.

5. 除了日用燃油柜和沉淀油柜, 滑油柜及淡水舱以及用于压载调纵倾的 F.P. TK FORE'D DEEP TK' (P)&(S) NO. 1 W.B. TK(P)&(S) 外, 其余舱室均为空舱. 应根据试验大纲的要求进行清舱.

All tanks should be dry except service and settling tanks of F.O., D.O. LUB. and fresh water tanks and F.P. TK FORE'D DEEP TK' (P)&(S) and NO. 1 W.B. TK(P)&(S) (for adjusting the trim at test), The tanks should be cleaned in accordance with the inclining test procedure.

6. 不足重量和多余重量不应大于试验条件下的排水量的 1%(约 30t), 移动重量和试验调纵倾用的压载水重量除外. 所有不足重量和多余重量应由验船师及船东认可.

Missing weights and surplus weights to be not greater than 1 percent of displacement (abt. 30t) at testing condition, but exclude shifted weight and water for ballast adjusting the trim of which required by testing, all missing & surplus weight to be verified by surveyors and owner.

7. 天气条件和海况, 倾斜试验应在平静水面和风力小于蒲氏风级 3 级以下进行. WEATHER AND SEA CONDITION: Inclining test to be carried out on calm sea condition and under three (3) Beaufort scale of wind.

8. 试验前, 所有的干隔舱和空舱人孔道门应打开, 以便由验船师及船东检查认可. 不能空的最好加满, 无法加满的要求专人用测深锤测深.

Before test, all tank to be prepared for inspection. All void and empty tanks shall be inspected by KR Surveyor and owner's supervisor. Any tanks which can't empty, preferably they should be full. If impossible, to be checked by manually hand lead.

9. 试验过程中, 不许有淡水消耗.

Consumption of fresh water is not allowed during the test.

10. 试验前, 应召集由友联倾斜试验小组, KR 验船师和船东参加的倾斜试验专题会, 以确认各项准备工作和是否符合进行试验的条件.

An inclining test planning meeting shall be arranged before start of the

test. KR surveyor and owner shall be invited to this meeting, to confirm the whole preparation and everything whether meet the requirement for inclining test.

五、试验方法 test method

1. F.P. TK FORE'D DEEP TK(P)&(S) NO.1 W.B. TK(P)&(S) 压满海水用于调纵倾, 试验设计最大横倾 2.5° , 最大倾斜移动重量 24.2t, 移动距离大约 14 米; 用重块使船舶产生横倾, 重块共计 $24.2 \times 2 = 48.4\text{t}$ 分成大至相等的 4 组 (P1, P2, S1, S2) 并在每个重块上标明组号, 每组重约 12.1t, 在上甲板 FR40-FR115 范围并且距船中心线的距离约 7.0m, 重块的位置、移动次序见附图;

最大移动重量 W 按下式计算:

$$W = ((\Delta \times GM) * \tan \theta_{\max}) / d = ((3100 \times 2.5) * \tan 2.5^{\circ}) / 14 = 24.2 \text{ t}$$

式中 Where:

W: 移动重块最大重量 (t) Max. shifted weight.

θ_{\max} : 试验设计最大横倾角 ($^{\circ}$) Max. heeling angle degree.

d: 重块移动距离 (m) Shifting distance of weight.

Δ : 试验状态下的排水量 (t) Displacement of the ship when testing.

GM: 未经修正的初稳心高度 (m) Metacentric height uncorrected for free surface.

F.P. TK FORE'D DEEP TK(P)&(S) and NO.1 W.B. TK(P)&(S) to be fully ballasted for adjusting trim before test. The designed max. heeling angle about 2.5° , max. moving weights about 24.2t, Shifting distance of weight about 14m. The total solid weight about $24.2 \times 2 = 48.4\text{t}$ to be divided 4 groups (P1, P2, S1, S2) of each approx. 12.1t with number marking on each weight block. All solid weight to be placed on the upper deck in way of FR40-FR115 with approximate transverse distance 7.0m offset from the centerline and the same height above base line of the vessel. Their locations and moving sequence as attached sheet and following table.

Note: The above calculation is based on the <STABILITY INFORMATION BOOKET—RESULT OF INCLINING EXPERIMENT> submitted by owner.

The original data of inclining test condition prior to vessel built delivery:

$\Delta_0 = 3319.39\text{t}$, $KM_0 = 9.69\text{m}$, $KG_0 = 7.08\text{m}$, $GM_0 = 2.61\text{m}$, $\text{daft}_0 = 3.097\text{m}$;

The correction data after taken out the 2nd deck hatch covers and structure then added the new structure (abt. 274t to be taken out and 37t to be added)

$\Delta = 3082.39\text{t}$, $KM = 10.08\text{m}$, $KG = 7.58\text{m}$, $GM = 2.50\text{m}$, $\text{daft} = 2.89\text{m}$

2. 倾斜角度的测量方法 Measurement of incline angle:

采用 2 个挂锤

NO.1 挂锤 FR.125 位置, 挂锤高度约 6.000 米.

NO.2 挂锤 FR.29 位置, 挂锤高度约 6.000 米.

The angles of inclination to be measured by two independent pendulums.

NO.1 pendulum at FR.125, length is about 6.000m.

NO.2 pendulum at FR.29, length is about 6.000m.

六、试验初试状态数据记录 The record of initial condition

1. 船厂和 KR 验船师、船东代表共同对准备工作全面检查, 观察风向、风速和周围水面情况, 确认符合进行试验的条件, 方可进行试验.

Before test, shipyard group, KR surveyor, and owner's supervisor will check together the whole preparations of the test, and confirm conditions of test.

2. 试验前准备工作完毕, 使船处于初始状态 STEP 0, 松缆待船稳定后(约 5 分钟), 船厂相关人员和船东代表、KR 验船师乘小艇, 仔细目测试验状态下的首中尾、左右吃水。然后测量海水比重, 记录海水温度, 按船级社要求水样要求从吃水的 25%和 75%处取 (约须 30 分钟).

At vessel initial STEP 0 condition, release all mooring ropes, while the ship is stable(about 5 minutes), Shipyard group, KR Surveyor and owner's supervisor will measure carefully the exact draft of both side of fore, mid, aft by eye. Then measure the specific gravity of sea water by means of hydrometer, the temperature to be recorded. The water sample should be taken at 25% and 75% of mean draft according to class comments. (about 30 minutes).

七、重块移动和摆锤读数

The sequence of shifting weight and pendulum reading

0) 在初始位置 STEP 0, 在船松缆稳定状态读挂锤第一组原始读数(约 10 分钟), 此时船处于正浮。

In original STEP 0 condition which ship is at the releasing and stable condition, write down the first group of pendulum reading(about 10 minutes). At this time the ship is not inclined.

1) STEP 1: P2 从左到右完毕后, 松缆待船稳定后(约 5 分钟), 读挂锤第二组读数(约 10 分钟)此时船处于右倾。

P2 from port to starboard, Release all mooring ropes, after ship is stable (about 5 minutes), then write down the second group of pendulum reading (about 10 minutes). At this time the ship is inclined to starboard side.

2) STEP 2: P1 从左到右完毕后, 松缆待船稳定后(约 5 分钟), 读挂锤第三组读数(约 10 分钟)此时船处于右倾。

P1 from port to starboard, Release all mooring ropes, after ship is stable (about 5 minutes), then write down the third group of pendulum and reading (about 10 minutes). At this time the ship is inclined to starboard side.

3) STEP 3: P1 从右到左完毕后, 松缆待船稳定后(约 5 分钟), 读挂锤第四组读数(约 10 分钟)此时船处于右倾。

P1 From starboard to port, Release all mooring ropes, after ship is stable (about 5 minutes), then write down the fourth group of pendulum reading (about 10 minutes). At this time the ship is inclined to starboard side.

4) STEP4: P2 从右到左完毕后, 松缆待船稳定后(约 5 分钟), 读挂锤第五组读数(约 10 分钟) 此时船处于正浮。

STEP 4: P2 From starboard to port, Release all mooring ropes, after ship is stable (about 5 minutes), then write down the fifth group of pendulum reading (about 10 minutes). At this time the ship is not inclined.

5) STEP 5: S2 从右到左完毕后, 松缆待船稳定后(约 5 分钟), 读挂锤第六组读数(约 10 分钟)此时船处于左倾。

S2 From starboard to port, Release all mooring ropes, after ship is stable (about 5 minutes), then write down the sixth group of pendulum reading (about 10 minutes). At this time the ship is inclined to port side.

6) STEP 6: S1 从右到左完毕后, 松缆待船稳定后(约 5 分钟), 读挂锤第七组读数(约 10 分钟)此时船处于左倾。

S1 From starboard to port, Release all mooring ropes, after ship is stable (about 5 minutes), then write down the seventh group of pendulum reading (about 10 minutes). At this time the ship is inclined to port side.

7) STEP 7: S1 从左到右完毕后, 松缆待船稳定后(约 5 分钟), 读挂锤第八组读数(约 10 分钟)此时船处于左倾。

S1 From port to starboard, Release all mooring ropes, after ship is stable (about 5 minutes), then write down the eighth group of pendulum reading (about 10 minutes). At this time the ship is inclined to port side.

8) STEP 8: S2 从左到右完毕后, 松缆待船稳定后(约 5 分钟), 读挂锤第九组读数(约 10 分钟) 此时船处于正浮。

S2 From port to starboard, Release all mooring ropes, after ship is stable (about 5 minutes), then write down the ninth group of pendulum reading (about 10 minutes). At this time the ship is not inclined.

9) 按船级社要求, 试验完毕, 船厂相关人员和船东代表、KR 验船师乘小艇, 仔细再次目测试验状态后的首中尾、左右吃水。(约须 20 分钟)。

Shipyard group, KR Surveyor and owner's supervisor will measure carefully again the exact draft of both side of fore, mid, aft by eye for to verify. (about 20 minutes) after STEP 8 according to class comments.

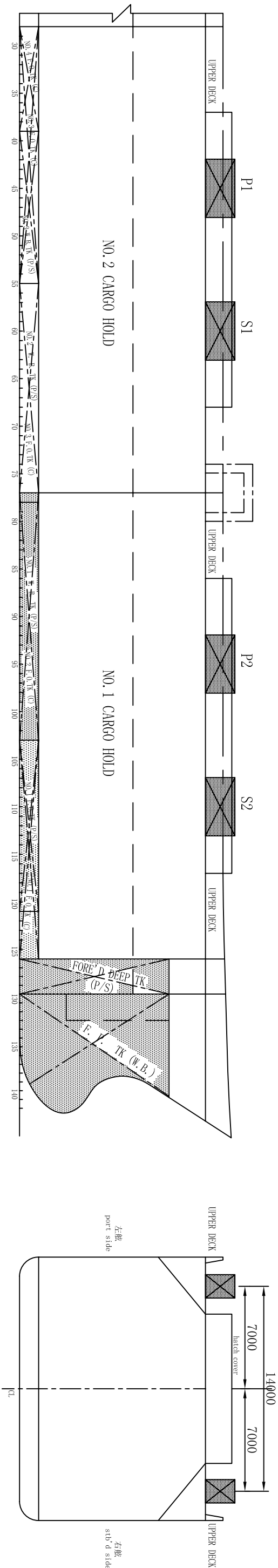
八、重块移动的顺序表如下:

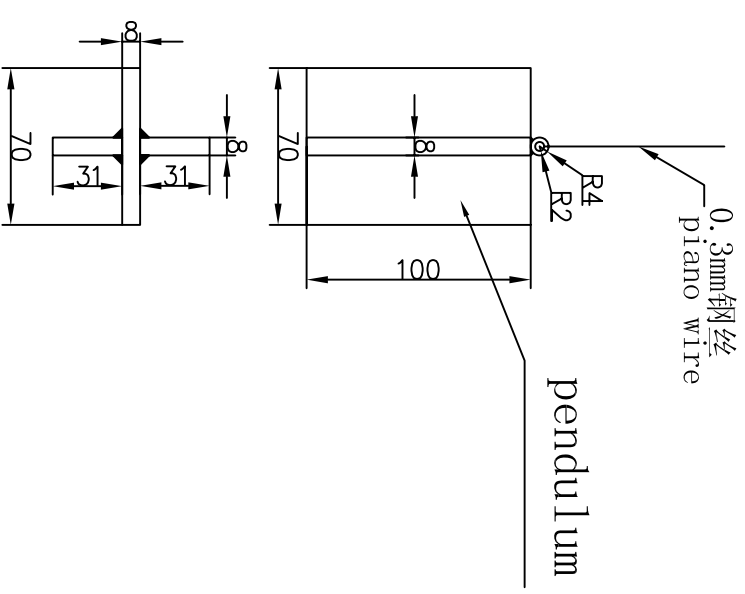
Weight moving sequence

移动次序 Moving Sequence	重块组移动 Group Moved	移动重块组位置 Weight Group Position After Moved		重块组移动方向 Direction Moved
		左 Port side	右 starboard side	
STEP 0		P1	S1	初始没移动

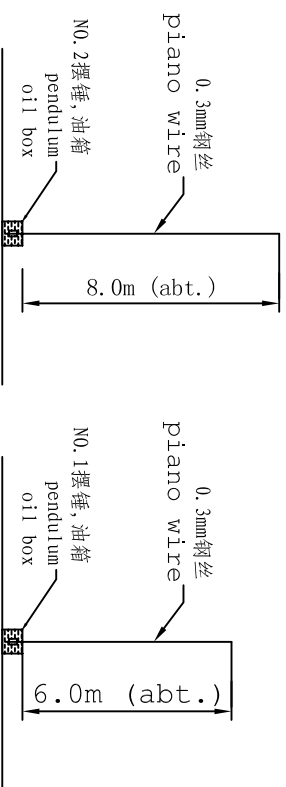
正浮		P2	S2	Initial Not moved
STEP 1 右倾		P1	S1	P2 从左到右 From port to starboard
	P2		P2 S2	
STEP 2 右倾	P1		P1 S1	P1 从左到右 From port to starboard
			P2 S2	
STEP 3 右倾		P1	S1	P1 从右到左 From starboard to port
	P1		P2 S2	
STEP 4 正浮	P2	P1	S1	P2 从右到左 From starboard to port
		P2	S2	
STEP 5 左倾		P1	S1	S2 从右到左 From starboard to port
	S2	P2 S2		
STEP 6 左倾	S1	P1 S1		S1 从右到左 From starboard to port
		P2 S2		
STEP 7 左倾		P1	S1	S1 从左到右 From port to starboard
	S1	P2 S2		
STEP 8 正浮	S2	P1	S1	S2 从左到右 From port to starboard
		P2	S2	

F. P. TK, FORE² D DEEP TK(P/S) AND NO. 1 W. B. TK(P/S) 压满海水用于调纵倾
F. P. TK, FORE² D DEEP TK(P/S) AND NO. 1 W. B. TK(P/S) to be fully ballasted for adjusting trim before test.

[illegible]



NO.1 挂锤FR125位置, 挂锤高度约6.000米。
NO.2 挂锤FR29位置, 挂锤高度约6.000米。
NO.1 pendulum at FR125, length is about 6.000m.
NO.2 pendulum at FR29, length is about 6.000m.

[illegible]

COGNATIZATION FOR M/V ALMA INCLINING TEST ORGANIZATION

