Certificate No

DET NORSKE VERITAS

PRODUCT CERTIFICATE

Manufacturer: Sichuan MetalMiracle Machinery Corp.

Manufacturer's order No.:

Purchaser:

Purchaser's order No.:

The product is intended for

Yard:

Yard No.: **N/A**

Name of vessel: **"N/A"**

DNV Id. No.:

THIS IS TO CERTIFY:

that the product: **Riser bearing**

Type designation: **RW28/998 Slewing bearing**
Intended purpose: **Loading arm Special heavy equipment**
Serial No(s): **RW28/998 (3 sets)**

Has been built and tested in accordance with the relevant requirements of:

DNV Rules for Classification: ☐ Ships ☐ HSLC ☐ Naval ☒ Offshore
☐ Other standards:

Remarks (if more than one line, use page 2):
See page 2.

The product was marked: MetalMiracle On: **Surface of the ring**

This field is only to be filled in when the certification is based on a Manufacturing Survey Arrangement (MSA).

The undersigned manufacturer declares that the product/system has been built and tested in accordance with the specification/standard stated above and the conditions referred to in
Manufacturing Survey Arrangement No:
Quality System Certificate No:

For Manufacturer:

Place:

Date:

(name)
(title)

This Certificate is only valid when signed by a DNV surveyor.

For **Det Norske Veritas AS**

Place:
Date:

Digitally Signed By: Wu, Rui
Location: DNV Wuhan, P.R.China
Signing Date: 2011-04-18

Wu Rui
Surveyor

Technical data:

Refer to approved plan.

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.

Remarks:

Following inspections had been done:

1. **Bearing ring material work certificates are reviewed and found complying with approved plan. Certificate No.20091202, 20100105, 20100106.**
2. **Measurement reports as following are reviewd and found acceptable. Dimensional measurement report No.110325-1, including dimensions, clearences and runouts. Hardness measurement report No. 110324-1-1, including hardness of raceway, roughness and soft zone.**
3. **NDT reports reviewed and found complying with purchaser's requirement, including UT for material and PT after final machining.**
4. **Relevant measuring devices' calibration validity is verified and found acceptable.**
5. **Visal inspection for all bearings is carried out and found acceptable.**
6. **Function test by running all bearings is carried out, no abnormity is observed.**
7. **Radomly verification of bearing No. RW28/998-07,09,11 on its main dimensions, axial and radial clearences, axial and radial runouts, surface roughness, raceway hardness, soft zone length. It is found the results are in line with manufacturer's record and complying with approved plan.**
8. **PT of raceways for bearing No. RW28/998-07,09,11is witnessed, found acceptable according to ASME VIII, appendix 8. PT operator's qualification is reviewed.**

NOTE:
Refer to comment No.344 to the approved plan, it is assumed a detailed inspection program for the bearings is established and included in the operational manual of the loading arm.

Marking and certificate numbers for the different parts:
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Drawings with dates of approval and/or type approval certificate number:

Drawing No.	**Revision**	**Drawing Name**
RW28/998	**1**	**Calculation Note; Non pressure carrying bearing, approved on 2010-08-24.**

DNV reference No.