No.

Japan International Cooperation Agency (JICA)
Ministry of Transport (MINTRANS)

# Final Report

# The Study on Urgent Rehabilitation Program of Ports in the Republic of Angola

# APPENDIX

August 2006

The Overseas Coastal Area Development Institute of Japan
Ecoh Corporation

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**Japan International Cooperation Agency (JICA)**
**Ministry of Transport (MINTRANS)**

# Final Report

# The Study on Urgent Rehabilitation Program of Ports in the Republic of Angola

## APPENDIX

**August 2006**

**The Overseas Coastal Area Development Institute of Japan**
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# APPENDIX-1

## Wind Direction and Frequency Tables

## Wind Direction and Frequency at the Port of Luanda

1 10 69
YEARLY

| Direction / U(m/s) | N | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW | W | WNW | NW | NNW | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 - 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.1 - 2.5 | 22 | 16 | 17 | 15 | 49 | 60 | 112 | 230 | 368 | 300 | 224 | 144 | 100 | 62 | 50 | 17 | 6 | 1792 |
| | 0.50 | 0.36 | 0.39 | 0.34 | 1.12 | 1.37 | 2.55 | 5.25 | 8.39 | 6.84 | 5.11 | 3.28 | 2.28 | 1.41 | 1.14 | 0.39 | 0.14 | 40.88 |
| 2.5 - 5.0 | 2 | 0 | 0 | 2 | 6 | 25 | 105 | 334 | 732 | 591 | 290 | 110 | 56 | 15 | 13 | 6 | 0 | 2287 |
| | 0.05 | 0.00 | 0.00 | 0.05 | 0.14 | 0.57 | 2.40 | 7.62 | 16.70 | 13.48 | 6.61 | 2.51 | 1.28 | 0.34 | 0.30 | 0.14 | 0.00 | 52.17 |
| 5.0 - 7.5 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 29 | 106 | 108 | 34 | 12 | 5 | 1 | 2 | 0 | 0 | 301 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.05 | 0.02 | 0.66 | 2.42 | 2.46 | 0.78 | 0.27 | 0.11 | 0.02 | 0.05 | 0.00 | 0.00 | 6.87 |
| 7.5 - 10.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.05 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 |
| 10.0 - 12.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12.5 - 15.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15.0 - 17.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 17.5 - 20.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20.0 - 22.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 22.5 - 25.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 25.0 - 27.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 27.5 - 30.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 30.0 - 100.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 24 | 16 | 17 | 17 | 56 | 87 | 218 | 594 | 1206 | 1001 | 549 | 266 | 161 | 78 | 65 | 23 | 6 | 4384 |
| | 0.5 | 0.4 | 0.4 | 0.4 | 1.3 | 2.0 | 5.0 | 13.5 | 27.5 | 22.8 | 12.5 | 6.1 | 3.7 | 1.8 | 1.5 | 0.5 | 0.1 | 100.0 |

Upper : Number of contents
Lower : Percentage of occurrence

Source : Meteorological Agency in Japan (2001～2004)

## Wind Direction and Frequency at the Port of Lobito

3 11 63
YEARLY

| Direction / U(m/s) | N | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW | W | WNW | NW | NNW | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 - 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.1 - 2.5 | 50 | 25 | 24 | 23 | 33 | 29 | 63 | 92 | 179 | 239 | 201 | 168 | 161 | 115 | 58 | 63 | 3 | 1526 |
| | 1.14 | 0.57 | 0.55 | 0.52 | 0.75 | 0.66 | 1.44 | 2.10 | 4.08 | 5.45 | 4.58 | 3.83 | 3.67 | 2.62 | 1.32 | 1.44 | 0.07 | 34.81 |
| 2.5 - 5.0 | 14 | 5 | 2 | 2 | 4 | 3 | 16 | 59 | 352 | 616 | 540 | 355 | 145 | 53 | 47 | 31 | 0 | 2244 |
| | 0.32 | 0.11 | 0.05 | 0.05 | 0.09 | 0.07 | 0.36 | 1.35 | 8.03 | 14.05 | 12.32 | 8.10 | 3.31 | 1.21 | 1.07 | 0.71 | 0.00 | 51.19 |
| 5.0 - 7.5 | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 65 | 223 | 212 | 59 | 11 | 8 | 2 | 1 | 0 | 587 |
| | 0.05 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.02 | 0.05 | 1.48 | 5.09 | 4.84 | 1.35 | 0.25 | 0.18 | 0.05 | 0.02 | 0.00 | 13.39 |
| 7.5 - 10.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 11 | 13 | 2 | 0 | 0 | 0 | 0 | 0 | 27 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.25 | 0.30 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.62 |
| 10.0 - 12.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12.5 - 15.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15.0 - 17.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 17.5 - 20.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20.0 - 22.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 22.5 - 25.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 25.0 - 27.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 27.5 - 30.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 30.0 - 100.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 66 | 30 | 26 | 25 | 38 | 32 | 80 | 153 | 597 | 1089 | 966 | 584 | 317 | 176 | 107 | 95 | 3 | 4384 |
| | 1.5 | 0.7 | 0.6 | 0.6 | 0.9 | 0.7 | 1.8 | 3.5 | 13.6 | 24.8 | 22.0 | 13.3 | 7.2 | 4.0 | 2.4 | 2.2 | 0.1 | 100.0 |

Upper : Number of contents
Lower : Percentage of occurrence

Source : Meteorological Agency in Japan (2001～2004)

## Wind Direction and Frequency at the Port of Namibe

4 10 61
YEARLY

| Direction / U(m/s) | N | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW | W | WNW | NW | NNW | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 - 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.1 - 2.5 | 14 | 10 | 8 | 7 | 15 | 15 | 31 | 92 | 165 | 130 | 66 | 56 | 40 | 20 | 13 | 16 | 0 | 698 |
| | 0.32 | 0.23 | 0.18 | 0.16 | 0.34 | 0.34 | 0.71 | 2.10 | 3.76 | 2.97 | 1.51 | 1.28 | 0.91 | 0.46 | 0.30 | 0.36 | 0.00 | 15.92 |
| 2.5 - 5.0 | 5 | 0 | 4 | 3 | 6 | 5 | 24 | 91 | 574 | 609 | 267 | 68 | 25 | 9 | 6 | 6 | 0 | 1702 |
| | 0.11 | 0.00 | 0.09 | 0.07 | 0.14 | 0.11 | 0.55 | 2.08 | 13.09 | 13.89 | 6.09 | 1.55 | 0.57 | 0.21 | 0.14 | 0.14 | 0.00 | 38.82 |
| 5.0 - 7.5 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 34 | 528 | 823 | 153 | 7 | 4 | 1 | 0 | 1 | 0 | 1555 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.05 | 0.78 | 12.04 | 18.77 | 3.49 | 0.16 | 0.09 | 0.02 | 0.00 | 0.02 | 0.00 | 35.47 |
| 7.5 - 10.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 125 | 218 | 30 | 0 | 0 | 0 | 0 | 0 | 0 | 379 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.14 | 2.85 | 4.97 | 0.68 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 8.65 |
| 10.0 - 12.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 19 | 22 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 43 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.43 | 0.50 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.98 |
| 12.5 - 15.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.09 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 |
| 15.0 - 17.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 17.5 - 20.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20.0 - 22.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 22.5 - 25.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 25.0 - 27.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 27.5 - 30.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 30.0 - 100.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 19 | 10 | 12 | 10 | 21 | 22 | 57 | 224 | 1414 | 1806 | 517 | 131 | 69 | 30 | 19 | 23 | 0 | 4384 |
| | 0.4 | 0.2 | 0.3 | 0.2 | 0.5 | 0.5 | 1.3 | 5.1 | 32.3 | 41.2 | 11.8 | 3.0 | 1.6 | 0.7 | 0.4 | 0.5 | 0.0 | 100.0 |

Upper : Number of contents
Lower : Percentage of occurrence

Source : Meteorological Agency in Japan (2001～2004)

## Wind Direction and Frequency at the Port of Cabinda

1 10 69
YEARLY

| Direction / U(m/s) | N | NNE | NE | ENE | E | ESE | SE | SSE | S | SSW | SW | WSW | W | WNW | NW | NNW | | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 - 0.1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 0.1 - 2.5 | 22 | 16 | 17 | 15 | 49 | 60 | 112 | 230 | 368 | 300 | 224 | 144 | 100 | 62 | 50 | 17 | 6 | 1792 |
| | 0.50 | 0.36 | 0.39 | 0.34 | 1.12 | 1.37 | 2.55 | 5.25 | 8.39 | 6.84 | 5.11 | 3.28 | 2.28 | 1.41 | 1.14 | 0.39 | 0.14 | 40.88 |
| 2.5 - 5.0 | 2 | 0 | 0 | 2 | 6 | 25 | 105 | 334 | 732 | 591 | 290 | 110 | 56 | 15 | 13 | 6 | 0 | 2287 |
| | 0.05 | 0.00 | 0.00 | 0.05 | 0.14 | 0.57 | 2.40 | 7.62 | 16.70 | 13.48 | 6.61 | 2.51 | 1.28 | 0.34 | 0.30 | 0.14 | 0.00 | 52.17 |
| 5.0 - 7.5 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 29 | 106 | 108 | 34 | 12 | 5 | 1 | 2 | 0 | 0 | 301 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.05 | 0.02 | 0.66 | 2.42 | 2.46 | 0.78 | 0.27 | 0.11 | 0.02 | 0.05 | 0.00 | 0.00 | 6.87 |
| 7.5 - 10.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.05 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.09 |
| 10.0 - 12.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 12.5 - 15.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 15.0 - 17.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 17.5 - 20.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20.0 - 22.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 22.5 - 25.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 25.0 - 27.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 27.5 - 30.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 30.0 - 100.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Total | 24 | 16 | 17 | 17 | 56 | 87 | 218 | 594 | 1206 | 1001 | 549 | 266 | 161 | 78 | 65 | 23 | 6 | 4384 |
| | 0.5 | 0.4 | 0.4 | 0.4 | 1.3 | 2.0 | 5.0 | 13.5 | 27.5 | 22.8 | 12.5 | 6.1 | 3.7 | 1.8 | 1.5 | 0.5 | 0.1 | 100.0 |

Upper : Number of contents
Lower : Percentage of occurrence

Source : Meteorological Agency in Japan (2001～2004)

# APPENDIX-2

## Liner Networks to/from West Africa

Carrier

Service : Frequency (every // days), Turn Round, Number of Vessels

Calling Ports

Europe－Africa

1. Baco-LINEr

Europe－Africa : 15days, 45 days, 3 vessels

Amsterdam(Netherlands) － Tilbury(UK) － Hamburg(Germany) － Antwerp(Belgium) － Rouen(France) － Nouadhibou(Mauritania) － Nouakchott(Maouritania) － Lagos(Nigeria) －Warri(Nigeria)－Port Harcourt(Nigeria)－Takoradi(Ghana)－Abidjan(Ivory Coast)－ San Pedro(Ivory Coast)－Amsterdam

2. CSAV／Montemar／Lykes

VSA 4 back-up : 7 days, 42 days, 6 vessels

Hamburg－Rotterdam(Netherlands)－Antwerp－Le Havre(France)－Dakar(Senegal)－ South America－Hamburg

3. DELMAS／OTAL

RORO Service : 9~10 days, 48 days, 5 vessels

Amsterdam－Tilbury－Dunkirk(France)－Antwerp－Le Havre－Le Verdon(France)－ Dakar － Abidjan － Pointe Noire(Republic of Congo) － Port Gentil(Gabon) － Libreville(Gabon)－Douala(Cameroon)－Takoradi－Abidjan－San Pedro－Vigo（Spain） －La Rochelle(France)－Amsterdam

Angola Shuttle : 14 days, 42 days, 3 vessels

Leixoes(Portugal)－Lisbon(Portugal)－Dakar－Abidjan－**Luanda(Angola)**－Abidjan－ Freetown－Monrovia－Dakar－Leixoes

Morocco Service : 7 days

Casablanca(Morocco) － Las Palmas(Canary IslaNDS) － Nouakchott － Dakar － Banjul(Gambia)－Dakar－Nouakchott－Casablanca

4. DELMAS／Setramar

Mediterraniean West Africa Service : 16 days, 48 days, 3 vessels

Livorno(Italy) － Salerno(Italy) － Genoa(Italy) － Marseilles(France) － Sagunto(Spain) － Dakar－Abidjan－Lome(Togo)－Libreville－Douala－Abidjan—San Pedro－Dakar－ Sagunto－Livorno

5. DELMAS／OTAL／MOL

Hebdo Service : 7 days, 35 days, 5 vessels

Felixstowe(UK) － Amsterdam － Antwerp － Le Havre － Montoir(France) － Dakar － Abidjan － Lome － Cotonou(Benin) － Tema(Ghana) － Abidjan － Dakar—Montoir—Felixstowe

Nigerian Express : 14 days, 42 days, 3 vessels

Hamburg － Antwerp － Felixstowe － Le Havre － Dakar － Conakry(Guinea) － Apapa(Nigeria)－Tincan(Nigeria)－Abidjan－Hamburg

6. Grimaldi LINEs

Central Express RORO: 8 days, 40 days, 5 vessels

Hamburg－Tilbury－Antwerp－Dakar－Tema－Cotonou－Lagos－Doula－Abidjan－Amsterdam－Hamburg

Southern Express RORO: North Europe, 11 days, 55 days, 5 vessels

Hamburg－Antwerp－Le Havre－Setubal(Portugal)－Dakar－Lome－Pointe Noire－**Luanda**－Paranagua(Brazil)－Santos(Brazil)－Dakar－Hamburg

MSC's geared container vessel (left)
Grimaldi Line's Ro– Ro vessel (right)

7. MAERSK SEALAND Safmarine Group

WAF 1 : 7 days, 21 days, 3 vessels

Algeciras(Spain)－Tema－Algeciras

WAF 2 : 7 days, 28 days, 4 vessels

Algeciras－Lome－Cotonou－Libreville－Douala－Algeciras

WAF 3 : 7 days, 42 days, 6 vessels

Leixoes－Malaga(Spain)－Algeciras－Apapa－Takoradi－Onne(Nigeria)－San Pedro－Leixoes

WAF 4 : 7 days, 28 days, 4 vessels

Malaga－Algeciras－Tema－Apapa－Onne－Algeciras－Malaga

WAF 5 Loop 1 : 14 days, 42 days, 3 vessels

Vigo(Spain) － Leixoes － Lisbon － Algeciras － **Luanda** － Luderitz(Namibia) － Walvis Bay(Namibia)－Vigo

WAF 5 Loop 2 : 14 days, 42 days, 3 vessels

Vigo－Leixoes－Lisbon－Algeciras－Dakar－Pointe Noire－**Luanda**－Walvis Bay－Lome－Vigo

WAF 6 Loop 1 : 14 days, 42 days, 3 vessels

Antwerp－Felixstowe－Dunkerque－Le Havre－Rouen－Montoir de Bretagne(France)－Algecirus－Abidjan－Lome －Cotonou－Tema－Antwerp

WAF 6 Loop 2 : 14 days, 42 days, 3 vessels

Antwerp(Belgium)－Felixstowe－Dunkerque－Le Havre－Rouen－Algecirus－Abidjan－Cotonou－Tema－Antwerp

WAF 7 : 7 days, 21 days, 3 vessels

Algeciras－Dakar－Freetown(Sierra Leone)－Monrovia(Liberia)－Banjul－Nouakchott－Nouadhibou－Algeciras

WAF 8 : 7 days, 14 days, 2 vessels

Algeciras－Dakar－Banjul－Algeciras

Nouakchott Service : 7 days, 28 days, 4 vessels

Algeciras－Nouakchott－Algeciras

Conakry Service : 7 days, 35 days, 5 vessels

Gioia Tauro(Italy)－Leghorn(Italy)－Algeciras－Conakry －Gioia Tauro

OPEX West Africa Express Service : 15 days, 60 days, 4 vessels

Aberdeen(UK) － Antwerp － Lisbon － Tenerife(Canary Islands) － Las Palmas － Safi(Morocco) － Bata(Equatorial Guinea) － Malabo(Equatorial Guinea) － Onne － Port Gentil－Sao Tome(Sao Tome and Principe)－Douala－Warri－Aberdeen

8. Mediterranean Shipping Co (MSC)

MSC relay : 7 days, 28 days, 4 vessels

Las Palmas－Abidjan－Takoradi－Tema－Lome－Cotonou－Apapa－Tincan－Douala －Abidjan－Las Palmas

Turkey & Wmed to Canary Islands, Tema and South America :

7 days, 56 days, 8 vessels

Istanbul(Turkey) － Gemlik(Turkey) － Izmir(Turkey) － Valencia(Spain) － Fos(France) － Barcelona(Spain) － Las Palmas － Tema － Victoria(Brazil) － Santos － Rio de Janeiro(Brazil)－Salvador(Brazil)－Suape(Brazil)－Pecem(Brazil)－Istanbul

9. NILE DUTCH AFRICA LINE（NDS）

Europe－West Africa : 30~40 days, 1 vessel

Leixoes － Lisbon － Sao Tome － **Luanda**(**Lobito(Angola) ／ Namibe(Angola) transhipped via Luanda**)－Leixoes

Europe－West Africa RORO Service : 8 days, 40 days, 5 vessels

Amsterdam－Antwerp－Rouen－Leixoes－Lisbon－Freetown－Monrovia－Abidjan－Sao Tome－**Luanda**(**Lobito／Namibe transshipped via Luanda**)－Pointe Noire（**Cabinda(Angola)／Soyo(Angola**)／Boma／Matadi transshipped via Pointe Noire）－Libreville－Douala－Abidjan－San Pedro－Leixoes－Amsterdam

NDS's Ro-Ro vessel

10. Portline (Guiver Line)

Europe－Cape Verde－West Africa : 9 days, 27 days, 3 vessels

Rotterdam － Leixoes － Lisbon － Las Palmas － S.Vincente(Cape Verde) － Praia(Cape Verde)－Conakry－Bissau(Guinea Bissau)－Dakar－Las Palmas－Lisbon－Rotterdam

11. Transinsular

Europe－Cabo Verde : 10 days, 20 days, 2 vessels

Lisbon－Leixoes－Las Palmas－S.Vincente－Praia－Bissau－Lisbon

12. Others

Messina : 12 days, 48 days, 4 vessels

North America－Africa

1. MAERSK SEALAND Safmarine Group

West Africa Express : 14 days, 42 days, 3 vessels

Houston(USA)－Savannah(USA)－Newark(USA)－Dakar－Conakry－Cotonou－Tema－Abidjan－Houston

COREX Service : 14 days, 56 days, 4 vessels

Brooklyn(USA)－Camden(USA)－Philadelphia(USA)－Savannah－New Orleans(USA)－Houston－NItti(Sierra Leone)－Freetown－Lome－Abidjan－Takoradi－Malabo－Luba(Democratic Republic of Congo)－Apapa－Onne－Douala－Bata－Port Gentil－**Lobito－Luanda－Soyo**－Brooklyn

MSC's geared container vessel (front)
Maersk Sealand's geared container vessel (back)

2. CP Ships

Atlantic : 15 days, 60 days, 4 vessels

Montreal(Canada)－New York－Baltimore(USA)－Charleston(USA)－Tema－Durban－Cape Town－Montreal

South America－Africa

1. MAERSK SEALAND Safmarine Group

SAWA Service : 7 days, 35 days, 5 vessels

Buenos Aires(Brazil)－Rio Grande(Brazil)－Itajai(Brazil)－Santos－Walvis Bay－Tema－**Luanda**－Pointe Noire－Libreville－Buenos Aires

2. NILE DUTCH AFRICA LINE（NDS）

Brazil－West Africa : 10 days, 40 days, 4 vessels

Sao Francisco do Sul(Brazil)－Itajai－Rio de Janeiro－Santos－**Luanda**－**Lobito**－**Namibe** － Pointe Noire**(Cabinda** ／ **Soyo** ／ Matadi ／ Libreville ／ Douala ／ Freetown transhipped via Point Noire)－Abidjan－**Soyo**－Sao Francisco do Sul

3. Portline (Guiver Line)

South America－Cabo Verde : 30 days, 30 days, 1 vessels

S.Vincente－Fortaleza(Brazil)－Santos－Praia－S.Vincente

Asia－Africa

1. CMA CGM／CSCL

Asia－Africa : 9 days, 72 days, 8 vessels

Shanghai(China) － Ningbo(China) － Fuquing(China) － Chiwan(China) － Port Kelang(Malaysia)－Durban(South Africa)－Tema－Lome－Abidjan－Lagos－Cotonou－Abidjan－Colombo(Sri Lanka)－Port Kelang－Shanghai

2. DELMAS

Ligne Asia Afrique : 9 days, 72 days, 8 vessels

Shanghai－Ningbo－Hong Kong－Singapore－**Luanda**－Pointe Noire－Libreville－Abidjan－Tema－Lome－Cotonou－Apapa－Douala－Pointe des Galets(Reunion)－Singapore－Shanghai

DELMAS - Midas : 16 days

Nhava Sheva(India)－Dubai(UAE)－**Luanda**－Pointe Noire－Tema－Abidjan－Apapa－**Luanda**－Nhava Sheva

3. Gold Star

Far East Africa Express : 12 days, 72 days, 6 vessels

Singapore－Port Kelang－Colombo－Pointe des Galets－Durban－Tema－Tincan－Cotonou－Lome－Abidjan－Colombo－Singapore

4. MOL／PIL

Asia／West Africa Service Loop 1 : 10 days, 70 days, 7 vessels

Hong Kong－Singapore－Port Louis(Mauritius)－Tamatave(Madagascar)－Durban－Tema－Apapa－Lome－Durban－Port Louis－Singapore－Hong Kong

Asia／West Africa Service Loop 2 : 10 days, 60 days, 6 vessels

Singapore－Cape Town(South Africa)－Cotonou－Apapa－Abidjan－Douala－Durban－Pasir Gudang(Malaysia)－Singapore

5. P&O Nedlloyd(under name of Safmarine)

Asia／West Africa Service : 7 days, 70 days, 10 vessels

Hong Kong－Singapore－Tanjung Pelepas(Malaysia)－Cape Town－Tema－Apapa－Cotonou－Lome－Abidjan－Hong Kong

Africa－Africa

1. MAERSK SEALAND Safmarine Group

Southern Range Feeder Loop 1 : 14 days, 14 days, 1 vessel

Lome－Douala－Bata－Calabar(Nigeria)－Pointe Noire－Matadi(Democratic Republic of Congo)－Port Gentil－Abidjan－Lome

Southern Range Feeder Loop 2 : 6 days, 6 days, 1 vessel

Pointe Noire－Matadi－Pointe Noire

IWA 1 : 6 days, 6 days, 1 vessel

Abidjan－Takoradi－Tema－Apapa －Abidjan

SAFWAF COMBO Service : 9 days, 45 days, 5 vessels

Durban－Cape Town－Walvis Bay－**Namibe**－**Lobito**－**Soyo**－**Cabinda**－Matadi－Luba－Douala－Libreville－Port Gentil－Pointe Noire－Durban

Angola Express : 8 days, 24 days, 3 vessels

Durban－East London(South Africa)－Cape Town－**Lobito**－**Luanda**－Luderitz－Durban

Namibia Express : 7 days, 21 days, 3 vessels

Durban－Luanda－Port Elizabeth－Cape Town－Walvis Bay－Durban

WASADI Service : 7 days, 35 days, 5 vessels

Walvis Bay－Tema－Luanda－Pointe Noire－Libreville－Walvis Bay

Angola Congo Express : 12 days, 48 days, 4 vessels

Antwerp－Lisbon－Safi－Las Palmas－**Lobito**－Pointe Noire－**Luanda**－**Soyo**－**Cabinda**－Matadi－Boma(Democratic Republic of Congo)－Abidjan－Antwerp

2. Mediterranean Shipping Co (MSC)

Angola Service : 7 days, 14 days, 2 vessels

Cape Town－**Luanda**－**Lobito**－Cape Town

3. NILE DUTCH AFRICA LINE（NDS）

South Africa－West Africa : 12 days, 24 days, 2 vessels

Durban－Cape Town－Pointe Noire(**Cabinda**／**Soyo**／Matadi／Libreville／Douala／Freetown transshipped via Pointe Noire)－Sao Tome－**Luanda**－**Lobito**－**Namibe**－Durban

Feeder West Africa : 6 days, 6 days, 1 vessel

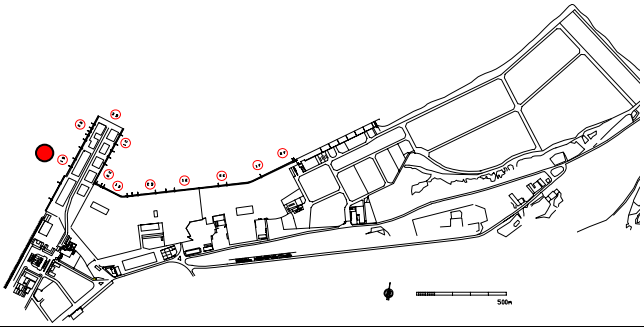
Pointe Noire－Boma－Matadi－**Cabinda**－**Soyo**－Libreville—**Luanda**—Pointe Noire

# APPENDIX-3

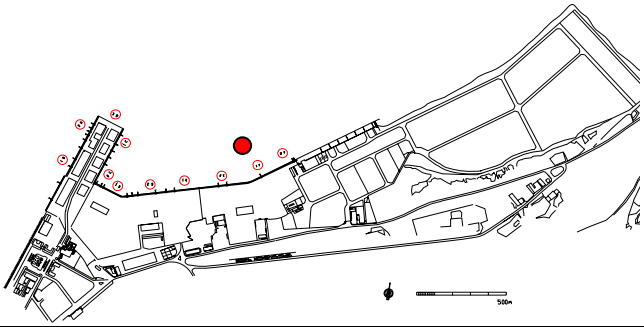
## Deterioration Assessment Sheets

# APPENDIX-3.1

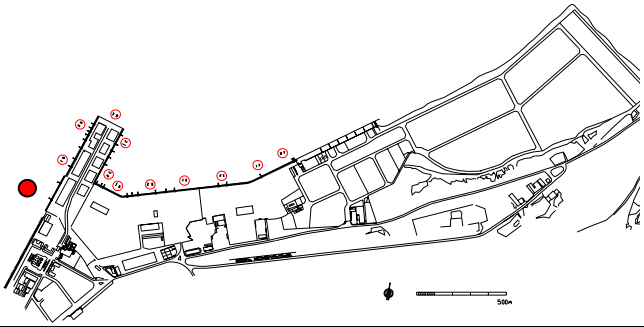
## Deterioration Assessment Sheets of the Port of Luanda

| | | | |
|---|---|---|---|
| **Facility ID** | Lu -01 -001 | **Survey Date** | 2005/04/29 |
| **Port Name** | Luanda | **Category** | Navigational Aids |
| **Year Purchased** | unknown | **Manufacturer** | unknown |
| **Maintenance Record** | unknown | | |
| **Facility Description** | In front of the cabotage terminal, floating buoy.<br>Color: Green | | |
| **Existing Condition** | According to the night-time observation, the lamp does not blink.<br>The floater is deformed and steel members are corroded. | | |
| **Structural Condition Assessment** | **Grade 2**<br>The facility is in structurally bad condition. It will become the object of rehabilitation plan. | | |
| **Location** |  | | |

**Photos**

| | | | |
|---|---|---|---|
| **Facility ID** | Lu -01 -002 | **Survey Date** | 2005/06/03 |
| **Port Name** | Luanda | **Category** | Navigational Aids |
| **Year Purchased** | unknown | **Manufacturer** | unknown |
| **Maintenance Record** | unknown | | |
| **Facility Description** | In front of the container terminal, floating buoy<br>Color: Red | | |
| **Existing Condition** | According to the night-time observation, the lamp does not blink.<br>The floater is deformed and steel members are tainted | | |
| **Structural Condition Assessment** | **Grade 2**<br>The facility is in structurally bad condition. It will become the object of rehabilitation plan. | | |
| **Location** |  | | |

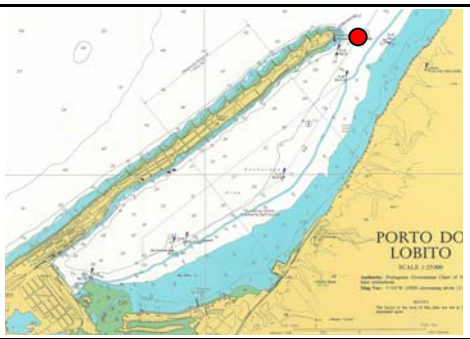
**Photos**

| | | | |
|---|---|---|---|
| **Facility ID** | Lu -01 -003 | **Survey Date** | 2005/06/03 |
| **Port Name** | Luanda | **Category** | Navigational Aids |
| **Year Purchased** | unknown | **Manufacturer** | unknown |
| **Maintenance Record** | unknown | | |
| **Facility Description** | In front of the cabotage terminal, fixed buoy<br>Color: White ? | | |
| **Existing Condition** | According to the night-time observation, the lamp does not blink.<br>The lantern is tainted. | | |
| **Structural Condition Assessment** | **Grade 2**<br>The facility is in structurally bad condition. It will become the object of rehabilitation plan. | | |
| **Location** |  | | |

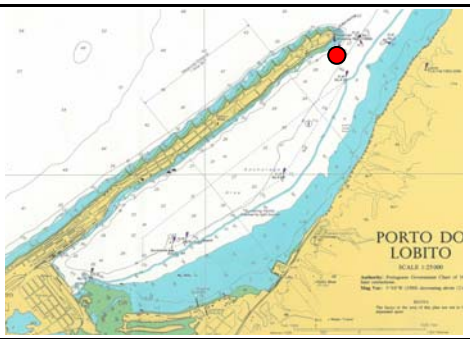
**Photos**

# APPENDIX-3.2

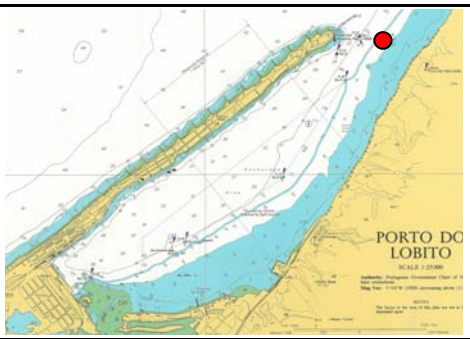
## Deterioration Assessment Sheets of the Port of Lobito

| | | | |
|---|---|---|---|
| **Facility ID** | Lo -01 -001 | **Survey Date** | 2005/05/10, 09/27 |
| **Port Name** | Lobito | **Category** | Navigational Aids |
| **Year Purchased** | 1993 (used item) | **Manufacturer** | Pharos Marine |
| **Maintenance Record** | The latest maintenance was conducted on 2003 | | |
| **Facility Description** | Floating buoy located at the port entrance<br>Starboard side, Color: Green<br>The light system is made in USA and the buoy is made in Cuba.<br>Acetylene is filled inside the buoy. | | |
| **Existing Condition** | According to the night-time observation, the lamp certainly blinks.<br>There can be seen some living organisms on the floater.<br>Steel members are partially corroded. | | |
| **Structural Condition Assessment** | **Grade 0**<br>The facility is in sound condition. Detailed survey is not rquired. | | |
| **Location** |  | | |

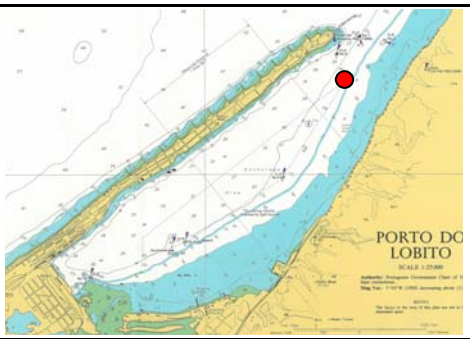
**Photos**

| | | | |
|---|---|---|---|
| **Facility ID** | Lo -01 -002 | **Survey Date** | 2005/05/10, 09/27 |
| **Port Name** | Lobito | **Category** | Navigational Aids |
| **Year Purchased** | 1993 (used item) | **Manufacturer** | Pharos Marine |
| **Maintenance Record** | The latest maintenance was conducted on 2003 | | |
| **Facility Description** | Floating buoy located inside the harbor<br>Starboard side, Color: Green<br>The light system is made in USA and the buoy is made in Cuba.<br>Acetylene is filled inside the buoy. | | |
| **Existing Condition** | According to the night-time observation, the lamp certainly blinks.<br>There can be seen some living organisms on the floater and some bird dropping on the solar battery panel.<br>Steel members are partially corroded and deformed. | | |
| **Structural Condition Assessment** | **Grade 0**<br>The facility is in sound condition. Detailed survey is not rquired. | | |
| **Location** |  | | |

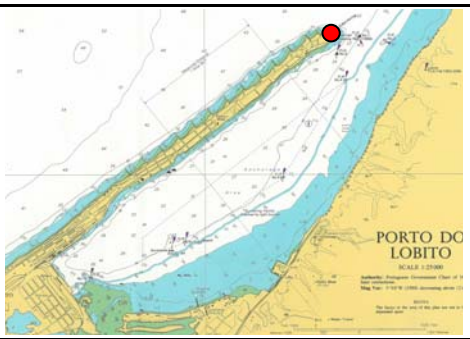
**Photos**

| | | | |
|---|---|---|---|
| **Facility ID** | Lo -01 -003 | **Survey Date** | 2005/05/10, 09/27 |
| **Port Name** | Lobito | **Category** | Navigational Aids |
| **Year Purchased** | 1993 (used item) | **Manufacturer** | Pharos Marine |
| **Maintenance Record** | The latest maintenance was conducted on 2003 | | |
| **Facility Description** | Floating buoy located at the port entrance<br>Portside, Color: Red<br>The light system is made in USA and the buoy is made in Cuba.<br>Acetylene is filled inside the buoy. | | |
| **Existing Condition** | According to the night-time observation, the lamp did not blink.<br>There can be seen some living organisms on the floater and some bird dropping on the steel members.<br>Steel members are partially corroded. | | |
| **Structural Condition Assessment** | **Grade 2**<br>The facility is in structurally bad condition. It will become the object of rehabilitation plan. | | |
| **Location** |  | | |

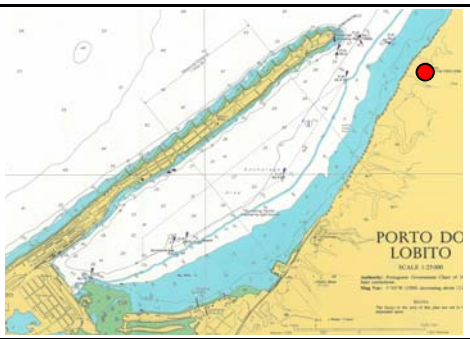
**Photos**

| | | | |
|---|---|---|---|
| **Facility ID** | Lo -01 -004 | **Survey Date** | 2005/05/10, 09/27 |
| **Port Name** | Lobito | **Category** | Navigational Aids |
| **Year Purchased** | 1993 (used item) | **Manufacturer** | Pharos Marine |
| **Maintenance Record** | The latest maintenance was conducted on 2003 | | |
| **Facility Description** | Floating buoy located inside the harbor<br>Portside, Color: Red<br>The light system is made in USA and the buoy is made in Cuba.<br>Acetylene is filled inside the buoy. | | |
| **Existing Condition** | According to the night-time observation, the lamp certainly blinks.<br>There can be seen some living organisms on the floater and some bird dropping on the steel members.<br>Steel members are partially corroded. | | |
| **Structural Condition Assessment** | **Grade 0**<br>The facility is in sound condition. Detailed survey is not rquired. | | |
| **Location** |  | | |

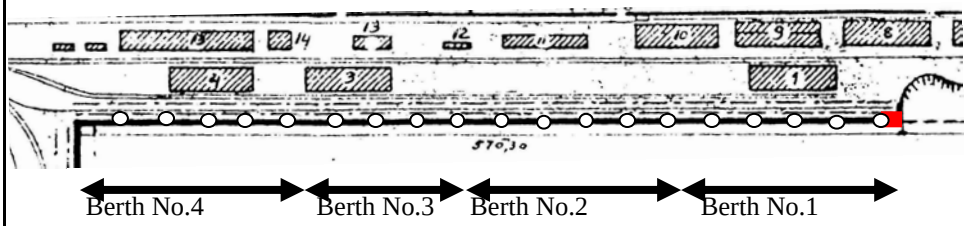
**Photos**

| | | | |
|---|---|---|---|
| **Facility ID** | Lo -01 -005 | **Survey Date** | 2005/05/10, 09/30 |
| **Port Name** | Lobito | **Category** | Navigational Aids |
| **Year Purchased** | 1996 | **Manufacturer** | |
| **Maintenance Record** | The latest maintenance was conducted on 2003 | | |
| **Facility Description** | Light house, "Farol Restinga", is located on the tip of the sand bank<br>Starboard side, Color: White | | |
| **Existing Condition** | According to the night-time observation, the lamp certainly blinks. | | |
| **Structural Condition Assessment** | **Grade 0**<br>The facility is in sound condition. Detailed survey is not rquired. | | |
| **Location** |  | | |

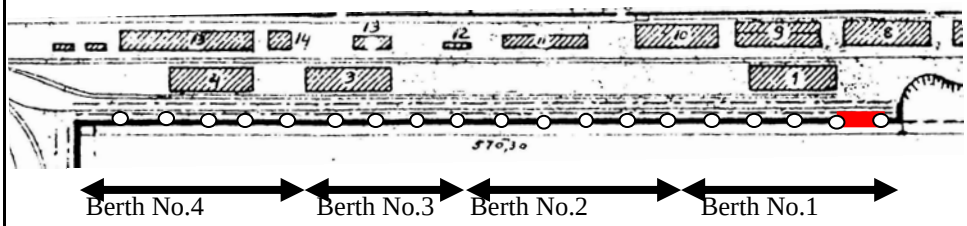
**Photos**

| | | | |
|---|---|---|---|
| **Facility ID** | Lo -01 -006 | **Survey Date** | 2005/04/08, 09/27 |
| **Port Name** | Lobito | **Category** | Navigational Aids |
| **Year Purchased** | 1996 | **Manufacturer** | |
| **Maintenance Record** | The latest maintenance was conducted on 2003 | | |
| **Facility Description** | Light house is located on the hill across the harbor<br>Portside, Color: White<br>The old light house is no longer used.<br>The light pole near the old light house is operated. | | |
| **Existing Condition** | According to the night-time observation, the lamp certainly blinks. | | |
| **Structural Condition Assessment** | **Grade 0**<br>The facility is in sound condition. Detailed survey is not rquired. | | |
| **Location** |  | | |

**Photos**

| | | | |
|---|---|---|---|
| **Facility ID** | Lo -02 -001 | **Survey Date** | 2005/09/27 |
| **Port Name** | Lobito | **Category** | Coping Concrete |
| **Year Constructed** | 1934 | | |
| **Maintenance Record** | unknown | | |
| **Facility Description** | Berth No.1<br>From Northend to Bollard No.1<br>An water supply bulb is found. | | |
| **Existing Condition** | The edges of the coping concrete are chipped off throughout the length of interval. | | |
| **Structural Condition Assessment** | **Grade 2**<br>The facility is in structurally bad condition. It will become the object of rehabilitation plan. | | |
| **Location** |  | | |

**Photos**

| | | | |
|---|---|---|---|
| **Facility ID** | Lo -02 -002 | **Survey Date** | 2005/09/27 |
| **Port Name** | Lobito | **Category** | Coping Concrete |
| **Year Constructed** | 1934 | | |
| **Maintenance Record** | unknown | | |
| **Facility Description** | Berth No.1<br>From Bollard No.1 to No.2<br>An crane socket is found. | | |
| **Existing Condition** | The edges of the coping concrete are chipped off throughout the length of interval. | | |
| **Structural Condition Assessment** | **Grade 2**<br>The facility is in structurally bad condition. It will become the object of rehabilitation plan. | | |
| **Location** |  | | |

**Photos**

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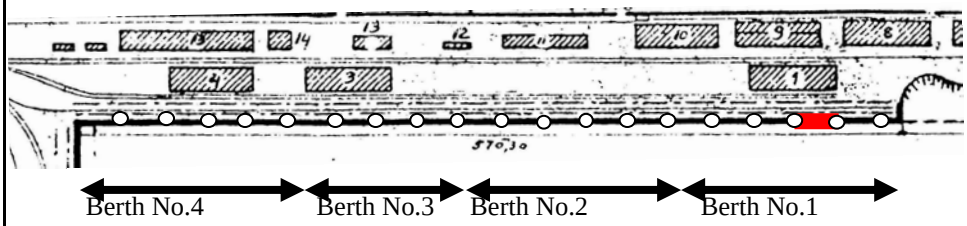
|---|---|---|---|
| **Facility ID** | Lo -02 -003 | **Survey Date** | 2005/06/01, 09/27 |
| **Port Name** | Lobito | **Category** | Coping Concrete |
| **Year Constructed** | 1934 | | |
| **Maintenance Record** | unknown | | |
| **Facility Description** | Berth No.1<br>From Bollard No.2 to No.3<br>An water supply bulb and a crane socket are found. | | |
| **Existing Condition** | The edges of the coping concrete are chipped off throughout the length of interval. | | |
| **Structural Condition Assessment** | **Grade 2**<br>The facility is in structurally bad condition. It will become the object of rehabilitation plan. | | |
| **Location** |  | | |

**Photos**

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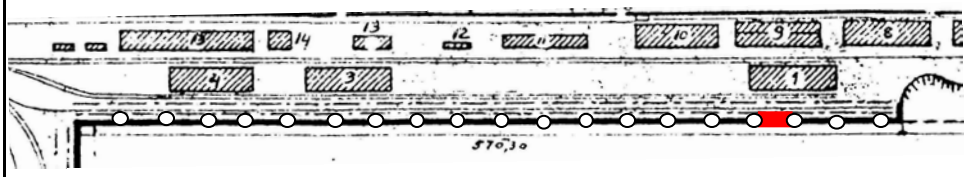
|---|---|---|---|
| **Facility ID** | Lo -02 -004 | **Survey Date** | 2005/06/01, 09/27 |
| **Port Name** | Lobito | **Category** | Coping Concrete |
| **Year Constructed** | 1934 | | |
| **Maintenance Record** | unknown | | |
| **Facility Description** | Berth No.1<br>From Bollard No.3 to No.4<br>An water supply bulb and a crane socket are found. | | |
| **Existing Condition** | The edges of the coping concrete are chipped off throughout the length of interval.<br>Partially repaired (encircled part in the photo hereunder) | | |
| **Structural Condition Assessment** | **Grade 2**<br>The facility is in structurally bad condition. It will become the object of rehabilitation plan. | | |
| **Location** |  <br>Berth No.4 Berth No.3 Berth No.2 Berth No.1 | | |

**Photos**

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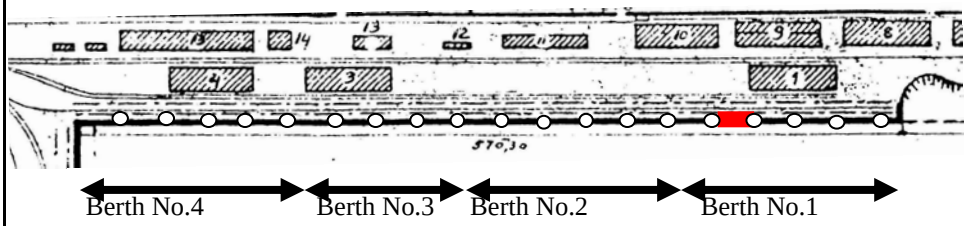
|---|---|---|---|
| **Facility ID** | Lo -02 -005 | **Survey Date** | 2005/06/01, 09/27 |
| **Port Name** | Lobito | **Category** | Coping Concrete |
| **Year Constructed** | 1934 | | |
| **Maintenance Record** | unknown | | |
| **Facility Description** | Berth No.1<br>From Bollard No.4 to No.5<br>An water supply bulb and a crane socket are found. | | |
| **Existing Condition** | The edges of the coping concrete are heavily chipped off throughout the length of interval. | | |
| **Structural Condition Assessment** | **Grade 2**<br>The facility is in structurally bad condition. It will become the object of rehabilitation plan. | | |
| **Location** |  | | |

**Photos**