モザンビーク共和国
運輸通信省

モザンビーク国
ナカラ港運営改善プロジェクト
業務完了報告書

2015 年 3 月

独立行政法人
国際協力機構（JICA）

一般財団法人　国際臨海開発研究センター

基盤
JR
15-046

略語表

略語	内容
ADMAR	Maritime Administration / Administração Maritima
ASEAN	Association of South‐East Asian Nations / 東南アジア諸国連合
BOR	Berth Occupancy Ratio
CDN	Corredor de Desenvolvimento do Norte / 北部回廊開発社
CEO	Chief Executive Officer
CFM	Portos e Caminhos de Ferro de Moçambique / モザンビーク港湾鉄道公社
CFO	Chief Financial Officer
CHE	Container Handling Equipment
CP	Counterpart
CT	Container Terminal
CTMS	Container Terminal Management System
CY	Container Yard
D/D	Detail Design
EMS	Environmental Management System
FS	Feasibility Study
GAZEDA	Gabinete das Zonas Económicas de Desenvolivimento Acelerado / 経済特区開発促進庁
GDP	Gross Domestic Product / 国内総生産
INATTER	Instituto Nacional de Transportes Terrestres / 国家陸上交通院
IT	Information Technology
JCC	Joint Coordination Committee / 合同調整委員会
JICA	The Japan International Cooperation Agency / 独立行政法人 国際協力機構
ME, MOE	Ministry of Energy / Ministério da Energia / エネルギー省
MLIT	Ministry of Land, Infrastructure, Transport and Tourism / 国土交通省
MOFA	Ministry of Foreign Affairs / 外務省
MPD	Ministry of Planning and Development / Ministério da Planificação e Desenvolvimento / 企画開発省
MTC	Ministry of Transport and Communications / Ministério dos Transportes e Comunicações / 運輸通信省
OCDI	The Overseas Coastal Area Development Institute of Japan / 一般財団法人 国際臨海開発研究センター
ODA	Official Development Assistance
OJT	On the Job Training
PDCA	Plan-Do-Check-Action
PDM	Project Design Matrix

略語	内容
PETROMOC	Petróleos de Moçambique, S.A.
PN	Portos do Norte, SA / 北部港湾会社
QC	Quay Crane / 岸壁クレーン
R/D	Record of Discussion
RTG	Rubber Tyred Gantry Crane
SDCN	Sociedade de Desenvolvimento do Norte / 北部開発協会
SG	Ship Gear
TA	Technical Assistance
TEEN	Special Export Terminal in Nacala / Terminal Especial de Exportações de Nacala / ナカラ輸出特別ターミナル
TF	Task Force
TIC	JICA Tokyo International Center / JICA 東京国際センター
TN	Terminais do Norte, SA / 北部ターミナル会社
TOR	Terms of Reference
TOS	Terminal Operating System
WBS	Work Breakdown Structure
WSR	Waiting Time / Service Time Ratio

目次

1. プロジェクトの概要

1.1 はじめに

日本国政府は、モザンビーク国政府の要請に応じ、2011 年 12 月 22 日に両者の間で交わされた討議議事録に基づき「モザンビーク共和国ナカラ港運営改善プロジェクト」(以下「プロジェクト」という）を実施することを決定した。

日本国政府の技術協力プログラムの実施機関である国際協力機構（JICA）は、モザンビーク国政府の関係機関と緊密な連携の下、2012 年にプロジェクトを開始した。国際臨海開発研究センター（OCDI）の専門家チーム（以下「プロジェクトチーム」という）は、JICA との契約に基づき モザンビーク側への技術移転を実施した。

1.2 プロジェクトの背景

ナカラ港は、ナカラ回廊地域のゲートウェー港である。ナカラ回廊地域は、モザンビークの北部諸州だけでなく、内陸国であるマラウィ国、ザンビア国を包含している。この地域の開発は、モザンビーク国が産業ポテンシャル発揮するうえで最優先課題の一つである。本地域の急速な発展に伴い貨物輸送は増大している。貨物量の増加に対応するため、ナカラ港の効率性を改善することが必要である。

1.3 プロジェクトの目的

プロジェクトの目的は下記の通り。

(1) 上位目標

貿易・経済活動が促進され、ナカラ回廊地域が開発される。

(2) プロジェクト目標

ナカラ港の効率的な港湾運営がなされる。

(3) 期待される効果

1) 港湾開発の方向性が示される。
2) 効率的な港湾運営に向けた関係者の役割・責任範囲が定められる。
3) 港湾管理・運営能力が改善される。
4) 港湾荷役技術が向上する。
5) 港湾施設・機材の維持管理技術が向上する。

1.4 対象地域

モザンビーク国ナンプラ州ナカラ港及びその周辺地域

1.5 関係機関

モザンビーク側の関係機関は以下のとおりである。

- MTC（**運輸通信省**）
- CFM（**モザンビーク港湾鉄道公社**）
- CDN（**北部開発回廊会社**）
- PN（**北部港湾会社**）

PN 社は本プロジェクト実施中の 2013 年 3 月に CDN の下請会社として新たに設立された。同社従業員のほとんどは旧 CDN 港湾部門から移籍となった。

上記関係機関の契約関係と資本関係は図 1.5-1 のとおりである。

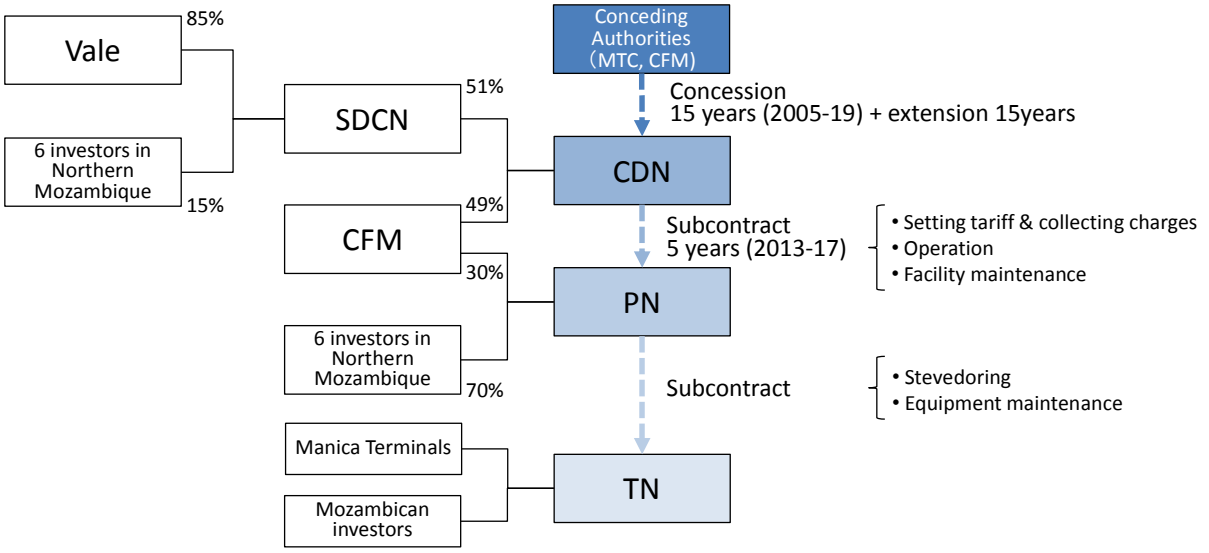


図 1.5-1 関係機関の資本関係

Vale: ブラジルの総合資源開発企業。主力商品は鉄鉱石で、生産・販売のシェアは 35%で世界一。その他、ニッケル（世界第 2 位）、ボーキサイト、銅、金、マンガン、炭酸カリウムなどを採掘している。鉄道・海運・発電なども手がける。

2. 業務の実施方法

以下の方法によりプロジェクトを実施した。

2.1 技術面の基本方針

(1) ナカラ港をめぐる最新状況に応じたプロジェクトの実施

以下の要因を含むナカラ港をめぐる最新状況に十分配慮した。

1) 北部回廊開発会社（CDN）の出資構成の変化
2) ナカラ港開発事業準備調査（2011 年 6 月）の予測を超えるコンテナ貨物の増加
3) 2013 年に行われたナカラ港運営の CDN からナカラ港運営会社（PN）への下請け契約
4) 我が国の ODA プロジェクトの進捗

(2) ナカラ港における OCDI の豊富な知見の活用

JICA 専門家は、OCDI から派遣された。OCDI は、下記プロジェクトを通じて得た知見を十分活用した。

1) ナカラ港開発事業準備調査（2011 年）（以下「準備調査」という）
2) ナカラ港の運営改善計画基礎情報収集・確認調査（2011 年）
3) モザンビーク共和国主要回廊港湾物流改善計画調査（2009 年）

(3) プロジェクトの各分野に最適な専門家の配置

プロジェクトチームのメンバーは、プロジェクトの実施に必要とされる専門的能力を考慮して選定・配置した。専門分野は、港湾計画、港湾管理・運営、港湾荷役、施設維持管理である。

(4) ナカラ港の現状やカウンターパートの技術レベルに見合った技術移転の実施

技術移転の効果を上げるため、ナカラ港のハード・ソフトの現状及びカウンターパートの経験・能力に十分配慮した。

(5) 無償資金協力・有償資金協力及び関連する協力との調整

北埠頭の「ナカラ港緊急改修計画」及びナカラ港能力増強のための「ナカラ港開発事業」と緊密な連携のもとにプロジェクトを実施した。

(6) 業務間の調整

プロジェクトの円滑な運営を確保するため、JICA 専門家の活動はそれぞれ緊密な連

携のもとに実施した。

(7) 効果の持続性に配慮した技術協力プロジェクトの実施

プロジェクト終了後にモザンビーク側が効率的な港湾運営を維持できるよう、プロジェクト効果の持続性に十分配慮してプロジェクトを実施した。

2.2 運営面の基本方針

(1) ワークプランに沿ったプロジェクト実施

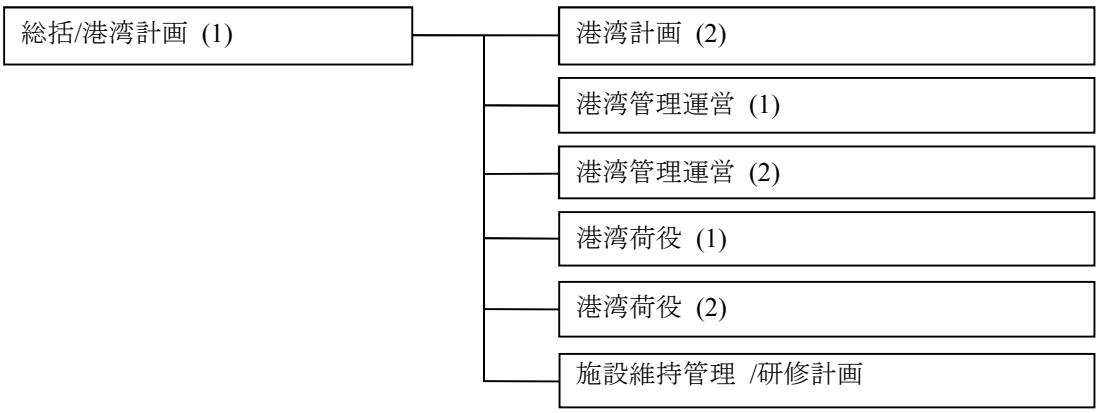
プロジェクトチームとモザンビーク側カウンターパート機関は、2012 年 4 月にワークプランに合意し、プロジェクトはワークプランに沿って実施された。

(2) ワークショップ、セミナー、0JT、研修等による着実な人材養成

効果的な技術移転を行うため、ワークショップ、セミナー、0JT、本邦研修等様々な手法を活用した。

3. 活動

3.1 専門家の配置



2012 年 4 月から 2015 年 2 月にかけて、JICA は計 10 回の専門家派遣を行った。

表 3.1-1 専門家の派遣

分野	氏名	期間
総括/港湾計画 (1)	岡田　光彦	第 1 回（2012 年 4 月 7～27 日） 第 2 回（2012 年 6 月 1～16 日） 第 3 回（2012 年 9 月 4～24 日） 第 5 回（2013 年 4 月 6～20 日） 第 7 回（2013 年 12 月 7～21 日） 第 8 回（2014 年 4 月 15 日～5 月 4 日） 第 9 回（2014 年 8 月 30 日～9 月 20 日） 第 10 回（2015 年 1 月 25 日～2 月 14 日）
港湾計画 (2)	宮地　豊	第 4 回（2012 年 12 月 3～23 日）
	國田　治	第 6 回（2013 年 6 月 10～30 日）
港湾管理運営 (1)	中島　潔	第 1 回（2012 年 4 月 7 日～5 月 5 日） 第 4 回（2012 年 12 月 3～23 日） 第 5 回（2013 年 4 月 6～28 日） 第 6 回（2013 年 6 月 10～30 日） 第 8 回（2014 年 4 月 15 日～5 月 4 日） 第 10 回（2015 年 1 月 25 日～2 月 14 日）
港湾管理運営　(2)	江藤　輝記	第 2 回（2012 年 6 月 1～16 日） 第 3 回（2012 年 9 月 4～24 日） 第 4 回（2012 年 12 月 3～23 日） 第 6 回（2013 年 6 月 11～30 日） 第 7 回（2013 年 12 月 7～21 日） 第 9 回（2014 年 8 月 30 日～9 月 20 日） 第 10 回（2015 年 1 月 25 日～2 月 14 日）
港湾荷役 (1)	一之瀬　政男	第 1 回（2012 年 4 月 7 日～5 月 5 日）

分野	氏名	期間
港湾荷役 (1)	木村　進	第 3 回（2012 年 9 月 4～27 日） 第 4 回（2012 年 12 月 3～23 日） 第 5 回（2013 年 4 月 6～28 日） 第 7 回（2013 年 12 月 7～21 日） 第 8 回（2014 年 4 月 15 日～5 月 4 日） 第 9 回（2014 年 8 月 30 日～9 月 20 日） 第 10 回（2015 年 1 月 25 日～2 月 14 日）
施設維持管理 /研修計画	川畑　辰夫	第 1 回（2012 年 4 月 7～27 日） 第 2 回（2012 年 6 月 1～16 日） 第 3 回（2012 年 9 月 4～27 日） 第 5 回（2013 年 4 月 6～28 日）
	甲元　正臣	第 6 回（2013 年 6 月 10～30 日） 第 7 回（2013 年 12 月 7～21 日） 第 8 回（2014 年 4 月 15 日～5 月 4 日） 第 9 回（2014 年 8 月 30 日～9 月 20 日）

3.2　カウンターパートの配置

モザンビーク国運輸通信省（MTC）のプロジェクトコーディネーターは、プロジェクトの関係機関である MTC、CFM（モザンビーク港湾鉄道公社）、CDN、PN からカウンターパートを指名した。カウンターパートは、港湾計画、港湾管理・運営、港湾荷役、施設維持管理といった分野ごとに指名された。カウンターパートは、期待される効果を発現させるためプロジェクトチームと協力し、プロジェクトを通じた技術移転の核として活動した。プロジェクト実施期間中に、30 人以上のカウンターパートが日本に招へいされ、カウンターパート研修を受講した。

3.3　タスクフォース

モザンビーク国内における効果的な技術移転を行うため、プロジェクトチームとカウンターパートは分野ごとにタスクフォースを立ち上げた。タスクフォースには、日モ双方からテーマに見合った参加者が出席した（Appendix-3 タスクフォース議事録参照）。

表 3.3-1 分野別タスクフォース

TF No.	タスクフォース分野	TF 開催回数	C/P 参加人数
General	一般	10	125
TF-1	港湾計画	8	120
TF-2	港湾管理運営	13	170
TF-3	港湾荷役	16	190
TF-4	施設維持管理（荷役機械）	10	94
TF-5	施設維持管理（土木）	15	110
	合計	72	809

タスクフォースは、3 年間、計 10 回の派遣で、合計 72 回開催した。

表 3.3-2 タスクフォース会議開催状況

No.	派遣回数	セッション番号	TF No.	タイトル	開催日
1	4th	1	TF-4	Meeting for Maintenance of CHE (Container Handling Equipment)	2012-12-11
2	4th	2	TF-3	Cargo Handling: IT technology in CT Business and its Necessity	2012-12-11
3	4th	3	TF-1	Meeting for Port Plan and Meeting for Port Administration and Management	2012-12-12
4	4th	4	TF-1	Meeting for Port Plan (World Shipping Trend)	2012-12-13
5	4th	5	TF-1	Meeting for Port Plan	2012-12-14
6	4th	6	TF-4	Meeting for Maintenance of CHE	2012-12-17
7	4th	7	TF-3	Cargo Handling: Methods of Handling Shipping Data	2012-12-17
8	4th	8	TF-2	Meeting for Port Administration and Management (Port EDI system of Japan)	2012-12-17
9	4th	9	TF-2	Meeting for Process Management Port Administration and Management (Project management)	2012-12-18
10	5th	1	TF-3	Meeting for Cargo Handling: IT System of CT Operation	2013-4-12
11	5th	2	TF-5	Meeting of Maintenance of Port Facilities: Preventive Maintenance / Maintenance Management	2013-4-12
12	5th	3	TF-1	Meeting for Port Plan	2013-4-12
13	5th	4	TF-2	Meeting for Port Administration & Management (Laws and Regulations)	2013-4-12
14	5th	5	TF-4	Meeting for Maintenance of Cargo Handling Equipment: Action Plan on the Improvement of Handling Equipment	2013-4-12
15	5th	6	TF-1	Meeting for Port Plan	2013-4-13
16	5th	7	TF-5	Meeting for Maintenance of Port Facilities: Preventive Maintenance / Maintenance Management	2013-4-13
17	5th	8	TF-1	Meeting for Port Plan	2013-4-15
18	5th	9	TF-2	Meeting for Port Administration and Management (Privatization of CT)	2013-4-15
19	5th	10	TF-4	Training session of Maintenance of Cargo Handling Equipment: Spare Part List for Periodically Replaced Parts and Emergency Parts	2013-4-15
20	6th	3	TF-3	Meeting for Cargo Handling	2013-6-18
21	6th	4	TF-5	Meeting of Maintenance of Port Facilities	2013-6-18
22	6th	5	TF-1	Meeting for Port Plan	2013-6-18
23	6th	6	TF-2	Meeting for Port Administration & Management	2013-6-19
24	6th	7	TF-1	Meeting for Port Plan	2013-6-19
25	6th	8	TF-5	Meeting for Maintenance of Port Facilities	2013-6-20
26	6th	9	TF-3	Meeting for Cargo Handling	2013-6-20
27	6th	10	TF-2	Meeting for Port Administration & Management	2013-6-20
28	6th	11	TF-3	Meeting for Cargo Handling	2013-6-21
29	6th	12	TF-2	Meeting for Port Administration & Management	2013-6-21
30	6th	13	TF-5	Meeting for Maintenance of Port Facilities	2013-6-24
31	7th	1	General	Discussion on TA plan of 7th dispatch and monitoring indicators	2013-12-11
32	7th	2	TF-5	Discussion on the maintenance plan of infrastructures (based on the result of survey by Geoibericos)	2013-12-11
33	7th	3	TF-3	Discussion on the revision of Phaeros system (upgrading plan by Phaeros engineers)	2013-12-12
34	7th	4	TF-5	Survey of infrastructures with Mozambican counterpart	2013-12-12
35	7th	5	TF-2	Discussion on the regulation of safety and the regulation of port operations (based on the comments of JICA TA Team)	2013-12-13

No.	派遣回数	セッション番号	TF No.	タイトル	開催日
36	7th	6	TF-3	Survey of Nacala 2nd Port (Dry Port)	2013-12-16
37	7th	7	TF-5	Discussion on the result of infrastructure monitoring carried out by Mozambican counterpart	2013-12-16
38	7th	8	TF-4	Discussion on equipment maintenance	2013-12-16
39	7th	9	General	Wrap-up meeting	2013-12-16
40	7th	10	TF-3	Discussion on productivity of container handling operation including dry port issues (extra session 1)	2013-12-17
41	7th	11	TF-5	Monitoring of infrastructures (extra session 2)	2013-12-18
42	8th	1	General	Discussion on Technical Assistance plan of 8th dispatch	2014-4-21
43	8th	2	TF-5	Discussion on the maintenance plan of infrastructures	2014-4-21
44	8th	3	TF-5	Joint site monitoring of the infrastructure	2014-4-22
45	8th	4	TF-5	Discussion on South Wharf Countermeasures	2014-4-22
46	8th	5	TF-4	Joint site monitoring of the equipment	2014-4-23
47	8th	6	TF-4	Discussion on Equipment Maintenance	2014-4-23
48	8th	7	TF-3	Discussion on the progress of the Phaeros system upgrading	2014-4-24
49	8th	8	TF-3	Discussion on improvement of dry port and procurement of spreaders with flippers	2014-4-24
50	8th	9	TF-2	Seminar for safety regulation of Nacala Port	2014-4-25
51	8th	10	TF-2	Lectures on “5S” and Environmental Management	2014-4-25
52	8th	11	General	Wrap-up Meeting: Steps to be taken until the 9th dispatch (September, 2014) and Progress of the Project based on PDM	2014-4-28
53	9th	1	General	Discussion on Technical Assistance plan of 9th dispatch	2014-9-4
54	9th	2	General	Discussion on Progress since April	2014-9-4
55	9th	3	General	Review of PN statistics	2014-9-5
56	9th	4	TF-3	Visit to the dry terminal and TEEN terminal	2014-9-5
57	9th	5	TF-5	Infrastructure maintenance (1): Infrastructure Monitoring & Basics of Level Survey	2014-9-9
58	9th	6	TF-5	Infrastructure maintenance (2): Joint Inspection	2014-9-9
59	9th	7	TF-4	Equipment maintenance (1)	2014-9-10
60	9th	8-1	TF-5	Infrastructure maintenance (3): Field Training of Level Survey	2014-9-10
61	9th	8-2	TF-4	Equipment maintenance (2)	2014-9-10
62	9th	9	TF-3	Upgrade status of Phaeros system	2014-9-11
63	9th	10	TF-2	“5S” Training: Guidance	2014-9-11
64	9th	11	TF-2	“5S” Training: Field Training (1)	2014-9-12
65	9th	12	TF-2	“5S” Training: Field Training (2)	2014-9-12
66	9th	13	General	Wrap-up meeting	2014-9-15
67	10th	1	General	Presentation of Completion Report	2015-1-30
68	10th	2	TF-4 (TF-5)	Site monitoring of the infrastructure and equipment	2015-1-30
69	10th	3	TF-3	Site monitoring of the dry terminal	2015-2-2
70	10th	4	TF-3	Discussion on data compilation	2015-2-2
71	10th	5	TF-3	Countermeasure against high wind in the container yard	2015-2-4
72	10th	6	General	Wrap-up meeting	2015-2-6

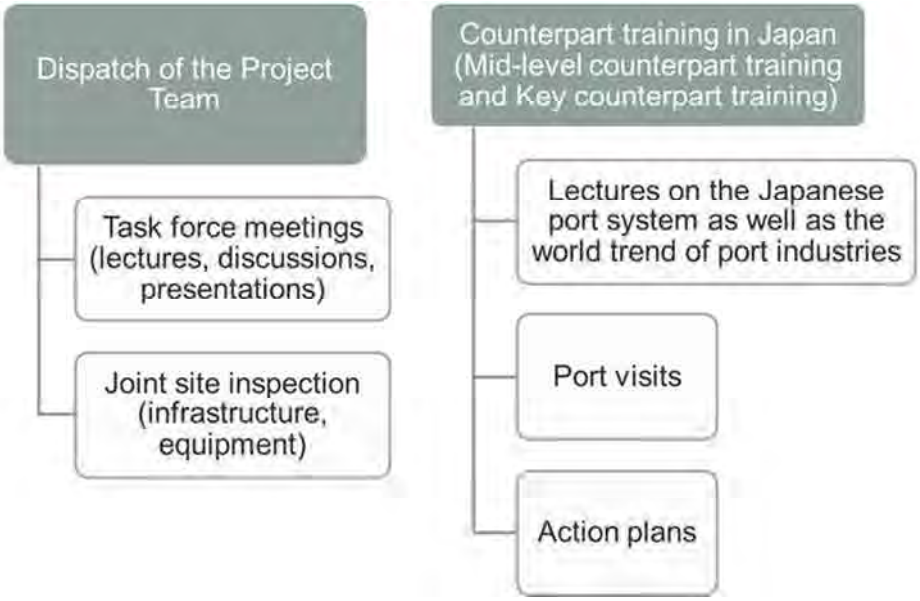


図　3.3-1　技術移転の方法

3.4 本邦研修

プロジェクト期間中に 4 回の本邦研修を実施し、6 機関から計 35 名が参加した。うち 1 回は幹部研修、残りの 3 回は中堅職員に対する研修である。

表 3.4-1 本邦研修参加者

Organization	Key counterparts	Mid-level counterparts	Total
MTC/ME	1	3	4
CFM	2	12	14
CDN		6	6
PN	1	8	9
TN		2	2
Total	4	31	35

(1) 第 1 回本邦研修（2012 年 8 月 20 日 - 8 月 31 日）

参加者

No.	氏名	所属組織	職責	備考
1	Maria Fernanda de Carvalho	MTC	Accountant	
2	Critiano Oliveira	CFM	Engineer Civil	
3	Braulio Franco Catutula	CFM	Técnico de Suportes Informáticos	
4	Nauaia Omar Mahonca	CFM	Conferente "A"	
5	Nilsa da Gloria Luis	CFM	Técnica de Contabilidade "C"	
6	Alfredo Rafael Sigola	CFM	Engineer Civil	
7	Lucas Jose Cipriano	CDN	PORT OPERATIONS MANAGER	
8	Bonifacio Alvaro Muassabao	CDN	GENERAL CARGO MANAGER	
9	Eusebio Ananias Ramos Logizela	CDN	Supervisor of Container Handling System	
10	Danilo Abdula Laisse	ME	Superintendent of the Terminal of PETROMOC Nacala Port	

研修日程

日付		時間	研修プログラム	講師	場所
20-Aug	Mon	9:00-11:30	JICA Briefing	JICA,OCDI	Yokohama
		11:30-12:30	JICA Orientation	JICA, OCDI	Yokohama
		13:30-15:00	Moving (Yokohama->Tokyo)	JICA, OCDI	-
		15:00-15:30	Courtesy call to JICA	JICA	Tokyo
		16:00-16:30	Courtesy call to MLIT	MLIT	Tokyo
		17:00-17:30	Courtesy call to OCDI	OCDI	Tokyo
		17:30-19:30	Moving (Tokyo->Yokohama)	JICA, OCDI	-
21-Aug	Tue	9:00-10:00	Moving (Yokohama->Tokyo)	JICA	―
		10:00-11:30	Lecture: Japan's ports and economic development	OCDI (Okada)	OCDI
		13:00-14:30	Lecture: Port Cargo Handling and Nacala Port Operation	OCDI (Eto)	OCDI
		15:00-16:30	Lecture: Maintenance for Cargo handling Equipment	OCDI (Kimura)	OCDI
		17:00-19:00	Welcome Party at Tokyo (17:00-19:00)	JICA, OCDI	Akasaka
		20:00-21:30	Moving (Tokyo->Yokohama)	JICA, OCDI	―
22-Aug	Wed	10:00-11:30	Lecture: Maintenance for Infrastrucure	OCDI (Kawabata)	YIC
		13:30-16:30	Field Study: Maintenance for Port Infrastructure	OCDI (Kawabata)	Yokohama Port
		16:30-18:00	Moving (to Yokohama)	JICA, OCDI	-
23-Aug	Thu	9:00-10:00	Courtesy Call on Yokohama port administration office	Port authority, JICA, OCDI	Yokohama port
		10:00-12:00	Study: Rolls of port administrator of Yokohama port	Port authority, JICA, OCDI	Yokohama port
		13:30-17:00	Field Study: Daikoku Container Terminal	Port authority, JICA, OCDI	Yokohama port
24-Aug	Fri	10:10-11:20	Field Study: Yokohama Port (Observation by a boat)	Port authority, JICA, OCDI	Yokohama port
		10:40-12:00	Field Study: Yokohama Port passenger terminal	Port authority, JICA, OCDI	Yokohama port
		13:30-16:00	Study: Maintenance of Tokyo Port Infrastructure (including Honmoku Container Terminal Field Study)	Port authority, JICA, OCDI	Yokohama port
25-Aug	Sat	All day	Preparation of Report / Drafting of Action plan / Preparing of Questionnaire	-	PC room in YIC
26-Aug	Sun	All day	Preparation of Report / Drafting of Action plan / Preparing of Questionnaire	―	PC room in YIC
27-Aug	Mon	All day	Moving (Yokohama->Haneda->Oita)	JICA, OCDI	-
28-Aug	Tue	9:00-10:00	Study: Outline of Equipment Manufacturer; MES	MES, JICA, OCDI	MES Oita
		10:15-12:00	Field Study: MES Plant for Port Stevedoring Equipment	MES, JICA, OCDI	MES Oita
		13:30-16:00	Lecture and Field Study: Maintenance of Port Stevedoring Equipment	MES, JICA, OCDI	MES Oita
29-Aug	Wed	All day	Moving (Oita->Haneda->Yokohama)	JICA, OCDI	-
30-Aug	Thu	9:00-10:30	Report: Preparation of Final Report and Action Plan	OCDI	YIC
		10:30-11:30	Discussion : Issues of Nacala Port	OCDI	YIC
		11:30-12:30	Discussion : Countermeasures to solve the issues of Nacala Port	OCDI	YIC
		14:00-16:30	Discussion : Action Plan for Nacala Port Development	OCDI	YIC
		16:30-18:00	Report: Preparation of Final Report and Action Plan	OCDI	YIC
31-Aug	Fri	10:00-12:00	Moving (Yokohama->Tokyo)	-	JICA Tokyo
		13:00-15:00	PRESENTATION; Final Report and Action Plan Preparation	JICA and OCDI	JICA Tokyo
		16:00-16:00	Evaluation discussions and Closing ceremony	JICA and OCDI	JICA Tokyo
		16:00-17:30	Moving (Tokyo->Yokohama)	-	JICA Tokyo

(2)　第 2 回本邦研修（2013 年 9 月 2 日 - 9 月 13 日）

参加者

No.	氏名	所属組織	所属部署	職責
1	Ms. SIMTE Lineza Amarpope	Portos do Norte('07)	Port Operations	Lecturer
2	Mr. QUINANE Atumane	Portos do Norte('13)	Port Operations	Port Operations Coordinator
3	Mr. MADEIRA Cremildo Rafael Da Silva	Portos do Norte('08)	Environment, Health and Safety	Coordinator
4	Mr. JUNIOR Afonso Vasco Da Cunha	Portos do Norte('13)	Maintenance Division	Maintenance Division Chief
5	Mr. INDUNA Neimo Da Esperanca Albert	Portes do Norte('13)	Port operations	Container Yard Manager
6	Ms. MATSINHA Anabela Emilia	Mozambique Ports and Railways('08)	Executive Directorate - CFM South	Civil Engineering and Transport
7	Mr. BAINHA Arceliu Lopes	Mozambique Ports and Railways, CFM Soth ('07)	Executive Directorate	Civil Engineer
8	Mr. MAFUCA Alfredo Artur	Mozambique Ports and Railways, CFM North('08)	Nacala Port Bulk Liquid Terminal	Manager
9	Ms. BENE Filomena Jose	CFM CENTRO('13)	Port Infrastructure Maintenance	Head of Department
10	Mr. BINZE Cesar Tomocene	CFM CENTRO('10)	Port Infrastructure Maintenance	Civil Engineer

研修日程

日付		時間	研修プログラム	講師	場所
2-Sep	Mon	9:00-12:00	JICA briefing on the stay in Japan	JICA	TIC
		13:30-14:30	Program Orientation	JICA, OCDI	TIC
		14:30-15:30	Moving (TIC->MLIT)	JICA, OCDI	-
		15:30-16:00	Courtesy call to MLIT	MLIT	MLIT
		16:00-16:30	Moving (MLIT->OCDI)	JICA, OCDI	-
		16:30-17:00	Courtesy call to OCDI	OCDI	OCDI
		17:30-19:30	Moving (OCDI->TIC)	JICA, OCDI	-
3-Sep	Tue	9:00-10:00	Moving (TIC->OCDI)	JICA	-
		10:00-11:30	Lecture: Japanese ports and economic development	OCDI (Okada)	OCDI
		13:00-14:30	Lecture: General consideration on cargo handlings, Operations at Nacala Port	OCDI (Eto)	OCDI
		15:00-16:30	Lecture: Maintenance of cargo handling equipment	OCDI (Kimura)	OCDI
		17:00-19:00	Welcome Party at Kojimachi, Tokyo (17:00-19:00)	JICA, OCDI	Tokyo
		19:00-20:00	Moving (venue->TIC)	JICA, OCDI	-
4-Sep	Wed	9:00-10:00	Lecture: Maintenance of port infrastrucure	OCDI (Komoto)	TIC
		10:00-11:00	Safety During Construction Work	TOA (Tomita)	TIC
		11:30-13:30	Lunch, moving (TIC->Toa Yokohama->Yokohama Port, Minami Hommoku),	JICA, OCDI	-
		13:30-16:30	Field study: Maintenance of port infrastructure (Yokohama Port)	TOA (Mikutsu)	Yokohama
		16:30-18:00	Moving (Yokohama->TIC)	JICA, OCDI	-
5-Sep	Thu	9:00-14:00	Moving (TIC->Tokyo Station->Sendai)	JICA, OCDI	-
		14:00-15:30	Lecture: Reconstuction of ports in Tohoku region after the earthquake disaster	MLIT (Tohoku)	Sendai
		15:30-17:00	Field study: Sendai City	JICA, OCDI	Sendai
6-Sep	Fri	9:30-10:00	Moving (Hotel->Sendai Port)	JICA, OCDI	-
		10:00-10:50	Field study: Sendai Port (Takasago Container Terminal)	MLIT (Tohoku)	Sendai
		11:00-12:00	Field study: Sendai Port (JX oil refinery)		Sendai
		12:00-17:00	Lunch - field study: Ishinomaki City - Sendai Station		Ishinomaki
		17:26-20:00	Moving (Sendai Station->Tokyo Station->TIC)	JICA, OCDI	-
7-Sep	Sat	All day	Preparation of report/action plan/questionnaires	-	TIC
8-Sep	Sun	All day	Preparation of Report / Drafting of Action plan / Preparing of Questionnaire	-	TIC
9-Sep	Mon	All day	Moving (TIC->Haneda->Oita->Beppu)	JICA, OCDI	-
10-Sep	Tue	8:20-9:00	Moving (Beppu->MES Oita)	JICA, OCDI	-
		9:00-10:00	Lecture: Overview of Mitsui Engineering & Shipbuilding (MES); stevedoring equipment manufacturer	MES	MES
		10:15-12:00	Field Study: MES Oita Plant		
		13:30-16:30	Lecture and field study: Maintenance of stevedoring equipment		
11-Sep	Wed	All day	Moving (Oita->Haneda->TIC)	JICA, OCDI	-
12-Sep	Thu	9:00-10:30	Discussion : Issues of Nacala Port	OCDI	TIC
		10:30-12:00	Discussion : Countermeasures to solve the issues of Nacala Port		
		13:00-15:00	Discussion : Action plan for the development of Nacala Port		
		15:00-17:00	Preparation of final report and action plan		
13-Sep	Fri	10:00-11:00	Presentation; final report and action plan	JICA and OCDI	TIC
		11:00-12:00	Evaluation discussions and closing ceremony		

(3)　第 3 回本邦研修（2014 年 7 月 28 日 - 8 月 8 日）

参加者

No.	氏名	職責、所属部署、所属組織	備考
1	Mr. ADUDOSSOMADO Zacarias Andarusse	Safety technician, Maritime services, Corredor de Desenvolvimento do Norte S.A(2013)	
2	Mr. CANDIDO Antonio Frederico	Deputy manager of port operations, Port-marit,ime services, Corredor de Desenvolvimento do Norte S.A(2014)	
3	Mr. MUSSA Ibraimo Nazimo	Port operations analyst, Maritime services, Corredor de Desenvolvimento do Norte S.A(2013)	
4	Ms. RIBEIRO Loni Jacqueline	Commercial Manager, Commercial division, Portos do Norte(2013)	
5	Mr. DIOGO Luis Alvito	Equipment manager, Maintenance division, Portos do Norte, S.A.(2014)	
6	Mr. FAQUIHE Abudo Sele	Civil Engineer Manager, Project Management Unit, Portos do Norte, S.A(2014)	
7	Mr. SALOMAO Helvio Jesus Correia	Manager of Operations, Port operations, Terminais do Norte S.A.(2010)	
8	Mr. LANGA Jaime Pedro	Operations, Port operations, Terminais do Norte S.A.(2013)	
9	Mr. JORGE Edgar Frederico	Chief supervisor, Engineering division, Mozambique ports and rail ways(2014)	
10	Mr. NGOCA Tomas Fortunato	Trainee on locomotive mechanic, Motor equipment department, Railways of Mozambique(2013)	
11	Mr. LANGA Samuel Joao	Lawyer, Legistics (Laws), National Institute for Land Transports(2007)	

研修日程

日付		時間	研修プログラム		講師／担当者	場所
28-Jul	Mon	9:30-12:00	Orientation	JICA briefing on the stay in Japan	JICA	TIC
		13:30-14:00	Orientation	Program Orientation	Komoto (OCDI)	
		14:00-15:00		TIC -> Kasumigaseki		
		15:00-15:30	Courtesy Call	Courtesy call to MLIT	Mr. Nakazaki (MLIT)	MLIT
		15:30-17:00		Kasumigaseki -> Hanzomon		
		17:00-17:30	Courtesy Call	Courtesy call to OCDI	OCDI	OCDI
		17:30-19:00		Welcome Party at OCDI	Komoto (OCDI)	
29-Jul	Tue	10:00-11:30	Lecture	Industrial Development Strategy of Mozambique	Nakashima (OCDI)	OCDI
		13:00-14:30	Lecture	Cargo handling operations at Nacala Port	Capt. Eto (OCDI)	
		15:00-16:30	Lecture	Maintenance of port infrastrucure	Prf. Iwanami (TIT)	
30-Jul	Wed	10:00-12:00	Field Study	Minamihonmoku Container Terminal Construction Site	Mr. Mikutsu (TOA)	Yokohama
		12:00-14:00		Minamihonmoku -> Kurihama		
		14:00-16:30	Lecture & Field Study	Measures against deterioration in port structures	Mr. Yamaji (PARI)	PARI
31-Jul	Thu	10:00-11:30	Lecture	General Presentation for Container Handling Cranes	Mr. Ichimura (MES)	OCDI
		13:00-14:30	Lecture	Safety during construction	Mr. Tomita (TOA)	
		15:00-16:30	Lecture	Environment control during construction		
1-Aug	Fri	10:00-12:00	Lecture	History and current operation of Yokohama Port	POY / YPC	Yokohama Port
		13:30-14:30	Field Study	Yokohama Port by ship		
		14:30-16:00	Field Study	Daikoku Container Terminal		
2-Aug	Sat					
3-Aug	Sun					
4-Aug	Mon			TIC->Haneda->Oita->Beppu		
5-Aug	Tue	9:00-10:00	Lecture	Overview of Mitsui Engineering & Shipbuilding; cargo handling equipment manufacturer	MES Oita	MES Oita
		10:15-12:00	Field Study	MES Oita Factory Tour		
		13:10-16:30	Lecture	Maintenance of cargo handling equipment		
6-Aug	Wed	10:00-12:00	Field Study	JX Oita Refinary Tour	JX Oita	JX Oita
				Oita->Haneda->TIC		
7-Aug	Thu	10:00-11:30	Discussion	Issues of Nacala Port	Komoto (OCDI)	TIC
		13:00-14:30	Discussion	Countermeasures to solve the issues of Nacala Port		
		15:00-16:30	Discussion	Action plan for the development of Nacala Port		
8-Aug	Fri	10:00-11:00	Presentation	Final report and action plan	JICA and OCDI	TIC
		11:00-12:00	Closing	Evaluation discussions and closing ceremony		

(4)　幹部研修（ 2013 年 7 月 8 日 - 7 月 19 日）

参加者

No.	氏名	組織	職責
1	Dr. Ana Dimande	Ministry of Transport and Communications	Project Manager, Nacala Port Rehabilitation Unity
2	Paulo Jafar Tarmamade	Mozambique Ports and Railways	Advisor and Team Leader of CFM Team, Board of Directors, Nacala Port
3	Jeremias Fernando Numes do Rego	Mozambique Ports and Railways	Terminal Manager, Port of Beira, Oil Jetty, Quay #12
4	Agostinho F. Langa Jr.	Portos de Norte, SA	Chief Operations Officer (COO), Port of Nacala

研修日程

日付		時間	研修プログラム	講師／担当者	場所
8-Jul	Mon	9:00-11:30	JICA Tokyo Briefing	JICA	TIC
		11:30-12:00	Orientation by OCDI	OCDI	TIC
		12:00-14:30	Lunch (TIC) and Moving (TIC => Kojimachi)		-
		14:30-15:00	Courtesy call to JICA Head office	JICA	Tokyo
		15:30-16:00	Courtesy call to Ministry of Foreign Affairs	MOFA	Tokyo
		16:30-17:00	Courtesy call to MLIT	MLIT	Tokyo
		17:30-18:00	Courtesy call to OCDI	OCDI	Tokyo
		18:30-20:00	Welcome Party	JICA, MLIT, MOFA, OCDI	Tokyo
9-Jul	Tue	10:00-11:30	Lecture: Port and regional development	Professor Ikeda	OCDI
		13:00-14:30	Lecture: Updated situations and future development of world-wide port	IAPH	OCDI
		14:30~15:30	Moving (Kojimachi => Ooi Terminal)		
		15:30-17:00	Lecture: Japanese port stevedoring and transporting industry	Utoku Corporation	Tokyo Port (Ooi Terminal)
10-Jul	Wed	10:00-10:15	Courtesy Call on Yokohama port administration office	OCDI (Komoto)	Yokohama port
		10:15-11:00	Study: Rolls of port administrator and History of Yokohama port development	Port authority, JICA, OCDI	Yokohama port
		11:15-12:00	Study: Rolls of port operation company and maintenance of cargo handling equipment and infrastructure	Yokohama Port Corporation	Yokohama port
		13:30-14:30	Field Study: Yokohama port tour	Port authority, JICA, OCDI	Yokohama port
		14:30-16:00	Field Study: Honmoku Container Terminal	Yokohama Port Corporation	Yokohama port
11-Jul	Thu	9:00-9:30	Courtesy Call to Embassy of Mozambique	Embassy of Mozambique	Tokyo
		9:30-10:00	Moving (Tamachi => Kojimachi)		
		10:00-11:30	Lecture: Business of world shipping industry	OCDI (Nakashima)	OCDI
		13:00-14:30	Discussion : Understanding of Nakala Port Status-quo	OCDI	OCDI
		15:00-16:30	Discussion : Development of Nakala Port in near future	OCDI	OCDI
12-Jul	Fri	10:00-12:00	Field Study: Research & Development Center - TOA	TOA Corporation	TOA

日付		時間	研修プログラム	講師／担当者	場所
			Corporation		
		12:00-14:00	Lunch and moving (Tsurumi => Honmoku)		
		14:00-16:00	Field Study: Japanese largest and deepest container terminal development	TOA Corporation	Yokohama port (Honmoku)
13-Jul	Sat	All day	Preparation of presentation / Action plan / Answering of Questionnaire	-	PC room in TIC
14-Jul	Sun	All day	Preparation of presentation / Action plan / Answering of Questionnaire	-	PC room in TIC
15-Jul	Mon	All day	Preparation of presentation / Action plan / Answering of Questionnaire	-	PC room in TIC
16-Jul	Tue	10:00-12:00	Lecture: Operation of regular shipment to Africa	MOL	MOL
		13:30-16:00	Lecture: Manufacturing and maintenance of cargo handling equipment (QC+RTG)	MES	MES
17-Jul	Wed	10:00-11:00	Lecture: Port EDI	MLIT or OCDI	OCDI
		11:00-12:00	Lecture: Safety operation during port rehabilitation period	TOA Corporation	OCDI
		15:00-15:20	PRESENTATION; The Nacala Port Development Project	MTC (Dr.Ana Dimande)	Kasumigaseki
		15:20-15:40	PRESENTATION; The railway and port operation by CFM in Mozambique	CFM (Paulo Jafar Tarmamade)	Kasumigaseki
		15:40-16:00	PRESENTATION; Operation and Services in Beira Port	CFM (Mr. Jeremias Fernando Numes do Rego)	Kasumigaseki
		16:00-16:20	PRESENTATION; PN's Operation and Services in Nacala Port	PN (Mr.Langa)	Kasumigaseki
		16:30-17:00	Questions and answers with Japanese private sector		Kasumigaseki
		17:30-18:30	Exchanging of greetings with Japanese private sector		Kasumigaseki
18-Jul	Thu	10:30-11:30	Discussion : (Nakala Port Development in Future)	OCDI	PC room in TIC
		11:30-12:00	Submission : Filled questionnaires	OCDI	PC room in TIC
		13:00-13:30	Discussion on Grant Aid Project	JICA, Ecoh	PC room in TIC
		13:30-16:30	Report: Preparation of Final Report and Action Plan	OCDI	PC room in TIC
19-Jul	Fri	10:00-11:00	PRESENTATION; Final Report and Action Plan Preparation	JICA and OCDI	JICA HQ
		11:00-12:00	Evaluation discussions and Closing ceremony	JICA and OCDI	JICA HQ

3.5 プログレスレポート

プロジェクト全体期間の活動結果については、以下にプログレスレポートの概要を時系列に記載する。

(1) プログレスレポート 1（2012 年 9 月）

本報告書は、2012 年 4 月から 8 月までのプロジェクトの進捗を取りまとめ、第 3 回派遣（2012 年 9 月）の際に提出したものである。この期間中に JICA は第 1 回派遣（2012 年 4 月）と第 2 回派遣（2012 年 6 月）を行った。本報告書は、2 回の専門家派遣を通じて明らかとなったナカラ港におけるニーズに即した技術移転の方向付けを行った。プロジェクトチームは、ナカラ港の効率性をモニターするための指標を設定した。また、モザンビーク及び日本におけるカウンターパート研修の計画も作成した。

プロジェクトチームは、準備調査の終了以降の経済環境の変化を分析し、準備調査が提案したコンセプトに基づきつつ所要の修正を加え、ナカラ港開発戦略を作成した。プロジェクトチームは、緊急性、全体計画との整合性、資金スキームとの整合性に配慮し、プロジェクトのコンポーネント（インフラ及び荷役機械）を 3 つのパッケージに整理した（表 3.5-1、図 3.5-1 及び図 3.5-2）。

表 3.5-1 プロジェクトパッケージの基本コンセプト

New Funding Scheme		Main Package	Effects	Comments	Cost (US$)
Concept	Grant Aid	Installation of rubber fenders to the north wharf Apron pavement to the north wharf Yard pavement at land-side of the north wharf Reach stacker 2 sets RTG 2 sets Firefighting equipment Loading arm	To enhance efficiency of container handling capacity (60% UP) Corresponding to the demand around year 2015	Listed packages are urgently required.	
	Loan-1	By-pass access road Gate construction Widening of entrance road Dredging (V=80,000m3) (*) Yard pavement at land-side of the north wharf RTG 3 sets Rail container terminal	To enhance efficiency of cargo handling relaxing port congestions To accelerate dredged soil, preparing soil disposing area Corresponding to the demand around year 2018	High standard environment protection technique shall be introduced from the experienced Japanese Consultant and Contractor.	
	Loan-2	Reconstruction of wharf (-14m) Quay gantry crane 2 sets (**) Dredging (V=115,000m3) RTG 3 sets Container yard pavement (Land-side) Container terminal management system including yard management system Others	Renovation to the high capacity deep water container terminal operation by Quay gantry crane Corresponding to the demand around year 2020	High standard environment protection technique shall be introduced from the experienced Japanese Consultant and Contractor.	

Cost estimates are based on the data of the Preparatory Study and thus need further reviews

Note: (*) To be dredged the area except adjacent to the new Wharf

(**) Electricity for Quay Gantry Crane shall be provided by Mozambique side.

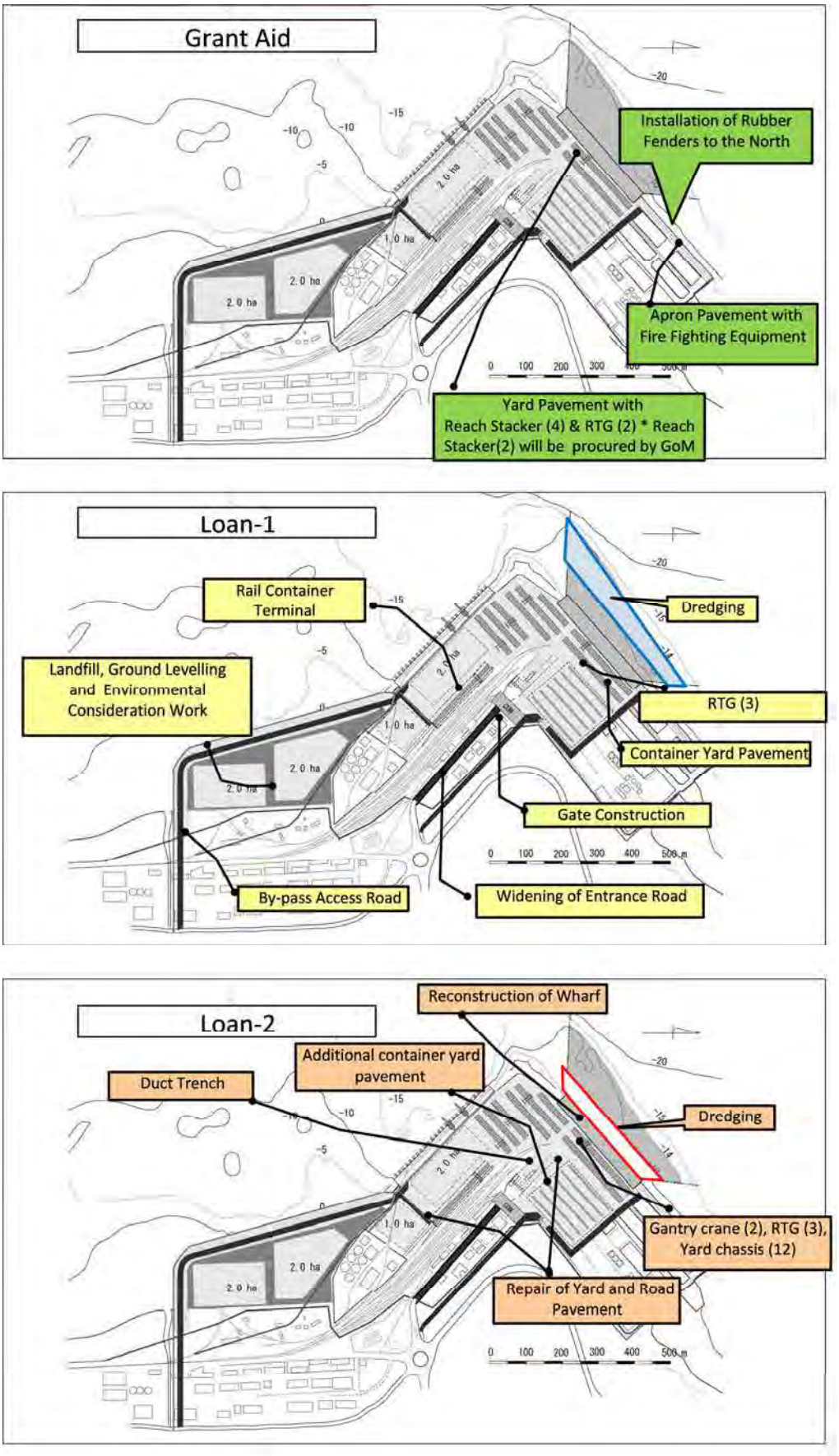


図 3.5-1 港湾開発段階計画

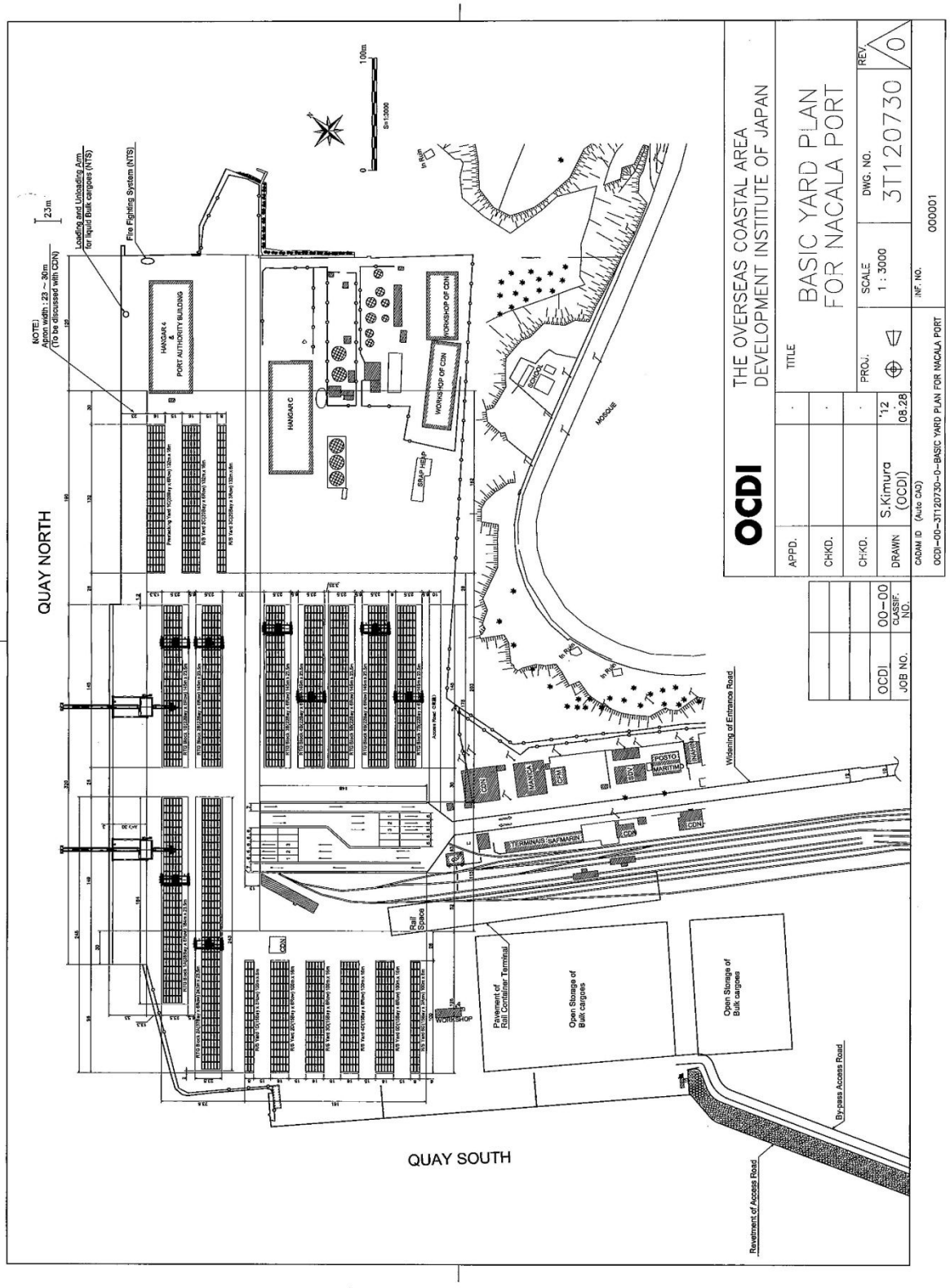


図 3.5-2 基本的ヤードプラン

(2)　　プログレスレポート 2（2013 年 4 月）

本報告書は、2012 年 10 月から 2013 年 3 月までのプロジェクトの進捗を取りまとめ、第 5 回派遣（2013 年 4 月）の際に提出したものである。2012 年 10 月、モザンビーク側は内部の協議に基づき技術移転のニーズを提案した（表 3.5-3)。 プロジェクトチームは、モザンビーク側のイニシアティブを高く評価し、この提案に沿った技術移転計画を作成した（表 3.5-2)。提案された技術移転のニーズは、計画、管理、運営、維持管理、港湾荷役等広範にわたった。

表 3.5-2 技術移転計画

Area	Subject	2012	2013			2014		2015
		Dec	Apr	Jun	Dec	Apr	Sep	Jan
Cargo Handling	Cargo Handling Equipment	●		●				
	Handling Productivity			●	●	●	●	●
	IT System for CT Operation	●	●	●	●	●	●	
	Yard Planning			●	●			●
	Capacity Building - Skill	●		●				
Maintenance (port facilities, cargo handling equipment)	Preventive Maintenance	●	●	●	●			
	Maintenance Manuals			●	●	●		
	Maintenance Management	●	●		●	●	●	●
	Spare Parts Inventory	●	●		●	●	●	
	Port Safety			●	●			●
Port Planning	Port Planning System	●	●					
	Demand Forecast		●					
	Grain Terminal Planning			●		●		
	World Shipping Trend	●						
	Environmental Considerations	●						
	Safety during Construction Works			●				
	Need of Revised Master Plan					●		
	Stacking Capacity					●		
Port Administration and Management	Laws and Regulations	●	●	●	●	●		
	Facilitation of Port Procedures	●			●	●	●	
	Privatization of CT		●					●
	Port Promotion		●					
	Port Security							
Process Management	PDCA Cycle	●						
	Mapping of Critical Process	●						
	Leadership and Alignment	●						

表 3.5-3　モザンビーク側提案の技術移転ニーズ

► Maintenance Plans + 06 Steps Plan – Achieve International Standards of Port Services Level

TARGETS:	**1. Ships Productivity:** **Net 10 Lifts / Ship-gear / hour**
	2. CY Turn-Time: **30 minutes from Gate-in to Gate-out**

■ Equipment Maintenance:	Optimization and Better Control of Equipment Maintenance Plan						
Objective	**Action Plan**	**Term**	**Person In Charge**	**Involved**	**Training**	**Cost**	**Improvements**
To improve Productivity assuring higher availability rate of Port equipment	1. Perform contract of PASICO – Company contracted to carry out maintenance (with parts supply) of all machines of the Port and carry out passing of knowledge to CDN professionals (3 months). 2. Define CDN Focal Points to receive specific training on Maintenance. 3. Hire 2 or 3 outsourcing personnel capable of carrying out and training CDN professionals in Maintenance – Estimative of a 1-year contract. Assist in the creation of an area of management and control of maintenance. 4. Acquisition of spare parts. Increase of 10% in 2013 budget for acquisition of spare parts. 5. Carry out Training in specific fields of maintenance (Electronics, Hydraulics, Mechanics) – Linked to Item 03	1.13/01/31 2. 12/10/16 3. 13/01/30 4. 13/03/01 5. 13/03/01	- Langa - Matos Fernandes	- TBA	- Maintenance (Hydraulics, Electronics and Mechanics) - Maintenance Management (Implementation, Quality Control Plans)	- TBD	1. Increase of Availability Rate of Equipment 2. Greater absorption of market demands.

■ Infrastructure Maintenance:	Optimization / Creation and Better Control of Infrastructure Maintenance Plan						
Objective	**Action Plan**	**Term**	**Person In Charge**	**Involved**	**Training**	**Cost**	**Improvements**
To improve Port infrastructure assuring more safety and agility for the operation.	1. Hiring of a Civil Engineer responsible for the Elaboration and Implementation of the Infrastructure Maintenance Plan. 2. Create an infrastructure inspection plan. 3. Allocate Budget for infrastructure maintenance.	1. 13/06/01 2. 13/08/01 3. 13/03/01	- Langa - Matos Fernandes	N/A	N/A	- TBD	1. Reduce number of breakdowns in infrastructure increasing its availability 2. Reduce number of accidents

■ Step 01:	Use Attachment With Flippers - Controlling it by Two Ropes						
Objective	**Action Plan**	**Term**	**Person In Charge**	**Involved**	**Training**	**Cost**	**Improvements**
To identify how loading / unloading operations from ships are carried out in order to optimize productivity.	1. Adjust Spreaders with Flippers and Ropes for guiding. 2. Carry out training of stevedores for the new operation.	1. 13/02/01 2. 13/04/01	- Lucas Cipriano	- Terminais do Norte	Required for the new operation model	0	1. Higher Productivity by smooth Ship Gear (SG) Ops 2. Less Damage to containers due to gentle contact of attachment

■ Step 02:	Modify the Container Yard (CY) & Re-naming / Striping						
Objective	**Action Plan**	**Term**	**Person In Charge**	**Involved**	**Training**	**Cost**	**Improvements**
To organize the Container Yard to simplify the operation and create more capacity.	1. To paint Letters and Numbers of the current Layout	1. 13/04/01	- Lucas Cipriano	N/A	N/A	- US $ 15,000	1. Able to increase in 25% the capacity of CY. 2. Easy management of the CY by allocating the space/blocks by status/kinds of containers. 3. Easy access to the assigned CY by truckers.

■ Step 03:	Prepare Enough Number of Cargo Handling Equipment (CHE) for Both CY-Gate & Ship Operations						
Objective	**Action Plan**	**Term**	**Person In Charge**	**Involved**	**Training**	**Cost**	**Improvements**
To guarantee a minimum quantity of equipment per operation to achieve the expected efficiency of the Port. - MINIMUM REQUIREMENTS: Ship Ops: 01 RS/2-SG at Apron (Dis. Only) 01 RS/SG at CY 02 Tractor-Chassis/SG CY - Gate Ops: 01 RS / 10~15 Gate Moves / Hour	0. Nacala Port has the necessary equipment for operation in the presented model for 01 Ship. 1. To discuss with JICA Team the hastening of the acquisition process of 02 Reach Stackers planned in the Grant Aid. 2. The acquisition of Tractor-Chassis will not be necessary, since it can be contracted in local market.	1. 12/10/20	- Ana Dimande - Langa	N/A	N/A	N/A	1. Higher productivity due to covering both Ship & CY-Gate Ops by enough CHE. 2. CY Turn time of external customers should become fewer than the present.

■ Step 04:	Manage the address of all the containers existing in the Container Yard						
Objective	**Action Plan**	**Term**	**Responsável**	**Involved**	**Training**	**Cost**	**Improvements**
To manage the exact “address” of all containers existing in the Container Yard all the time. NOTE: This is considered to be the first step to become a Terminal Container within international standards.	1. To map all cargo flows and modes of transport (physical and administrative) 2. To process the announcement of cargo; 3. To register entries (by land and ship); 4. To set the park by type of handling, ship owner and ship; 5. To localize the containers and their movements;	2013/6/30	- Matos Fernandes	PN / CDN notifying shipping agents and companies	To train internal agents in two phases 1 - Generalist on systems (3 days); 2 - Use of application (3 days) 3 - Sensitization seminar for external agents	20,000 USD for system upgrading + cost of training + 7,500 USD / month to keep the system active	1. Increase of efficiency in cargo handling and lifting since it is strictly localized 2. Reduction of errors and elimination of informality in management and lifting ops.

プロジェクトチームは、この技術移転計画に基づき 2012 年 12 月の第 4 回派遣から技術移転を開始した。プロジェクトチームはナカラにおいて計 9 回のワークショップを開催し、MTC、 CDN、CFM、PN から延べ 133 人が参加した。技術移転を行うに当たっては、カウンターパートが積極的に講義に参加し学んだ事項を計画、管理、運営、評価に反映させる「参加型アプローチ」を採用した。

港湾荷役に関しては、プロジェクトチームはナカラ港のコンテナターミナルが国際的に妥当なサービス水準を達成するために今後とるべき 6 段階の措置を提案した（図 3.5-4)。

図 3.5-3　技術移転の重点

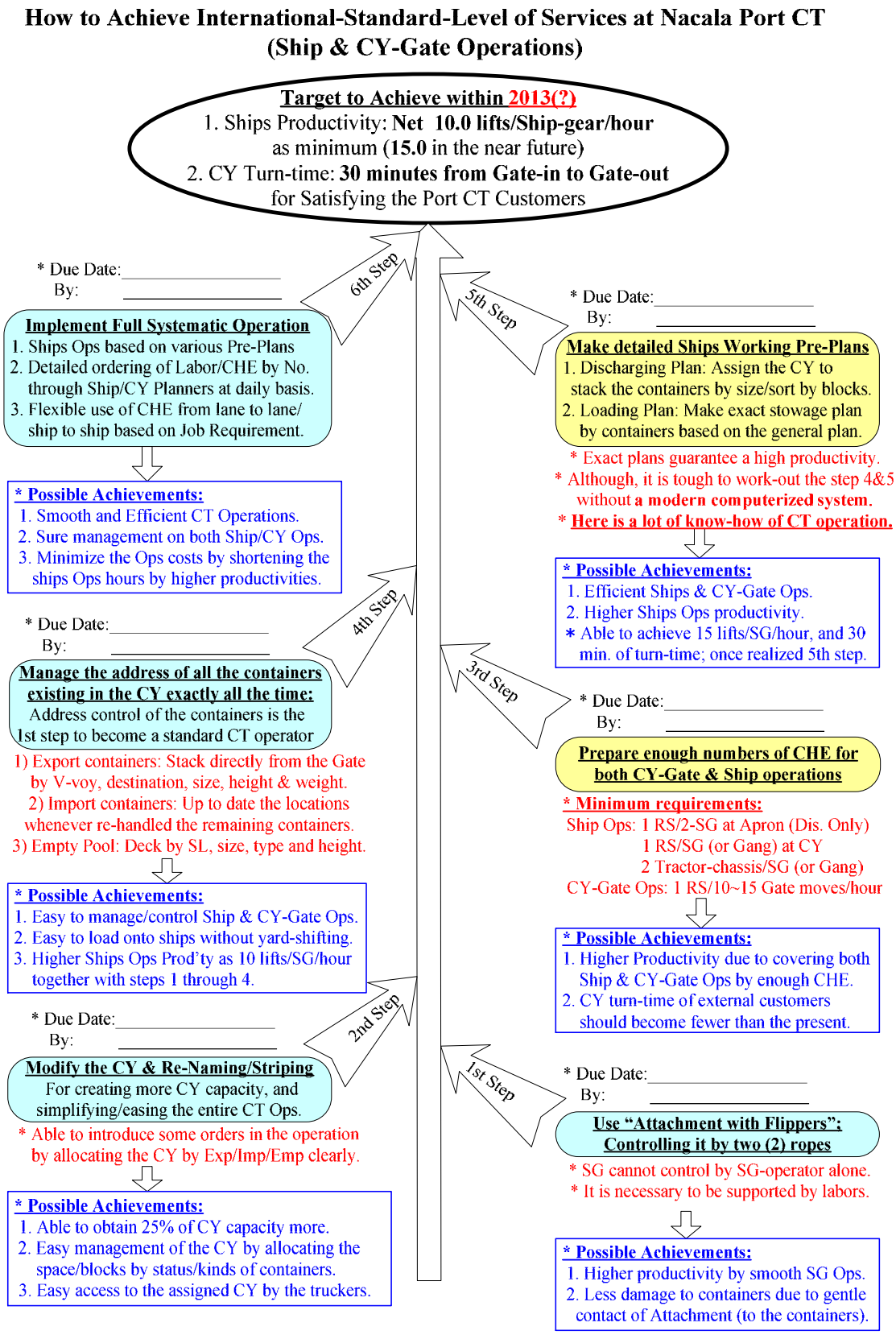


図 3.5-4　国際的なサービス水準達成に向けた 6 段階の措置

(3)　　プログレスレポート 3（2013 年 11 月）

本報告書は、2013 年 4 月から 10 月までのプロジェクトの進捗を取りまとめて第 7 回派遣（2013 年 12 月）の際に提出したものである。この期間中に JICA は第 5 回派遣（2013 年 4 月）と第 6 回派遣（2013 年 6 月）を行った。2 回のモザンビーク滞在期間中に、プロジェクトチームは 24 回の講義を行い延べ 272 人のカウンターパートが参加した。さらに、プロジェクトチームはナカラ港のインフラ、荷役機械の現状把握のため現地踏査を行った。また、JICA は本邦における幹部研修（MTC、CFM、PN の 4 名）を 7 月、一般職員研修（CFM、PN の 10 名）を 9 月にそれぞれ実施した。一般職員研修にはアンゴラからの研修生も参加して合同で研修を受講するとともに、それぞれの港の経験を共有した。

技術移転の進捗状況は以下の通り。

1)　　港湾計画

プロジェクトチームは、モザンビーク側が将来自ら港湾計画を立てられるよう、港湾計画の基礎的なツールを紹介した。一つはバース占有率 (BOR)と待ち時間/サービス時間比率(WSR)である。プロジェクトチームは、これらの指標の計算・評価手法をナカラ港の実際のバース使用実績を用いて解説した。これにより、ターミナルの混雑状況を評価し、生産性を改善する方法を発見できるようになることが期待される。もう一つのツールは貨物量予測におけるマクロ予測手法である。プロジェクトチームは準備調査の際に行われたマクロ需要予測を例として、GDP を用いたマクロ予測手法の基礎を解説した。

また、プロジェクトチームはプロサバンナ・プロジェクトに対応して将来効率的な穀物ターミナルを整備する際に有用な資料を提供し、解説した。

2)　　港湾管理・運営

プロジェクトチームは、2013 年 4 月にナカラ港規則案の点検を開始した。重要性、緊急性を考慮して、安全規則 （規則案の第 7 章に規定）及び港湾運営規則（規則案第 3 章に規定）の検討を行った。モザンビーク側と逐条の検討を行った結果、既存の規則案第 3 章はほぼ問題がないことを確認した。ただし、一般貨物とコンテナ貨物に関する船社の責任範囲が異なること及びコンテナ貨物に特有の書類に配慮した既定の追加が必要である旨の助言を行った。

モザンビーク側がナカラ港安全規則案を発表したのに対し、プロジェクトチームは「神戸港コンテナターミナル安全方針」の解説を行った。神戸港の安全方針は、ナカラ港が本格的なコンテナターミナルとして生まれ変わった際にナカラ港に導入されるべき安全規則の参考になると考えられる。

さらに、プロジェクトチームはナカラ港の運営上の改善を国際マーケットに周知することの重要性や収入管理の観点からみた港湾料金設定手法の基礎、 船社・荷主を対象とした港湾振興の基礎について指導した。

3)　　港湾荷役

プロジェクトチームは、ワークショップの場でコンテナターミナルのマネージメントシ

ステムについての講義を行い、モザンビーク側がナカラ港のターミナル効率の改善のためどのような IT システムを導入すべきか計画することができるようになることを目指した。これに対し、PN は既存のターミナルオペレーションシステムである Phaeros を改良し利用開始する計画を説明した（同システムは、不具合により長く休眠状態にあった）。その際、PN はモザンビークの IT 企業である STRING 社の専門家を雇用するとした。

近年ナカラ港のコンテナ貨物量は年間 7 万 TEU を超えている。このため、効果的なターミナルオペレーションシステムの助けなしにコンテナターミナルの管理運営を行うことは困難になっている。Phaeros はタンザニア港湾庁が管理するダルエスサラーム港やムトワラ港で利用されているので、ナカラ港においても利用可能と思われる。

ただし、Phaeros は道具に過ぎないことに留意する必要がある。システムが良くても、PN はシステムが効果的に動作するようスタッフの訓練を行う必要がある。特に、ヤードプラン、シッププランの担当者の能力増強を図ることが重要である。PN は現在初歩的なターミナルプランしか行っていないため、PN のスタッフが必要な知識を身に着けるのには時間を要する。このためプロジェクトチームは、PN が 5 年以上の実務経験を有する 3、4 人のシッププラン、ヤードプランの専門家を海外から招へいし、モザンビークのカウンターパートに１、２年の OJT を行って技術移転を図るよう助言した。

4)　土木施設の維持管理

プロジェクトチームは、モザンビーク側がナカラ港のインフラの定期点検計画を作成することができるよう、維持管理計画の基礎についての講義を行った。PN はインフラの維持管理計画の策定を外注する計画であったので、プロジェクトチームは PN の土木技術者が計画の作成、実行に関与すべきであると助言を行った。

プロジェクトチームは、現地踏査を通じて、構造物の劣化の進行に伴い南埠頭の岸壁法線から 30m 背後のコンテナヤードは沈下が進んでいることを確認した。このためプロジェクトチームは、南埠頭の桟橋部は過大な荷重や力の作用を避けるべきである旨の技術資料を作成し、モザンビーク側に助言を行った。具体的には、現在桟橋部の直背後のコンテナヤードに置かれている実入りコンテナは、舗装への荷重を減らしこれ以上の沈下を避けるため移動するよう提言した。また、構造物の定期点検を行うよう指導した。

プロジェクトチームは、南埠頭、北埠頭の構造物の健全度、インフラの維持管理の考え方、機器を用いた点検方法等についての講義を行った。プロジェクトチームが持参した測定機器は CFM に供与され、モザンビーク側が自ら点検、モニタリングを行うことを目指した。

5)　荷役機械の維持管理

プロジェクトチームは、定期交換部品、緊急交換部品のリストをエクセル表化してメンテナンス担当者に提供した。また、ペンバ港からの研修参加者に対して、リーチスタッカーのブームの不具合の修繕方法について指導するとともに、ペンバ港のメンテナンス部門がスペアパーツの調達権限を持ちナンプラやマプトの上部機関の承認なしに購入して迅速に対応することが望ましい旨の助言を行った。

(4)　　プログレスレポート 4（2014 年 4 月）

本報告書は、2013 年 12 月から 2014 年 3 月までのプロジェクトの進捗を取りまとめて第 8 回派遣（2014 年 4 月）の際に提出したものである。この期間中の 2013 年 12 月に、JICA は第 7 回派遣（2013 年 12 月）を行った。モザンビーク滞在期間中に、プロジェクトチームは 11 回のワーキングセッションを開催し延べ 80 人のカウンターパートが参加した。また、プロジェクトチームとモザンビーク側カウンターパートは合同で現地踏査及び点検を実施した。

両者は 2013 年 12 月 9 日にマプトで開催された合同調整委員会（JCC）においてプロジェクトが順調に進捗していることを確認するとともに、プロジェクト目標の達成に向けて今後とるべき方策について合意した(表 3.5-4)。

表 3.5-4 ナカラ港の効率を改善するために取るべき措置

	Steps	Timeline	
		January	before April 2014
Mozambican side	◦Start of infrastructure monitoring and maintenance based on the Geoibericos report and employment of a civil engineer (PN, CDN, CFM)	✓	
	◦Review of the JICA Team's comments on Phaeros upgrading and start of the Phaeros system (PN)		✓
	◦Review of the JICA Team's comments on the safety regulations (CDN)	✓	
	◦Monitoring of the container handling productivity based on 3 indicators (PN)	✓	
	◦Determination of the pavement design of the dry terminal (TN, PN)		✓
	◦Review of the rehabilitation measures for the South Wharf indicated in the Geoibericos report (CDN, CFM)		✓
	◦Procurement of spreaders with flippers (TN)		✓
JICA Team	◦Review of rehabilitation measures for the South Wharf indicated in the Geoibericos report	✓	
	◦Review of the infrastructure maintenance plan proposed in the Geoibericos report	✓	
	◦Preparation of lecture materials on "5S"		✓
	◦Preparation of lecture materials on environmental management		✓
	◦Start of the procurement process for survey equipment (preparation of an equipment list needed for quantitative monitoring)		✓

技術移転の進捗状況は以下の通り。

1) 港湾計画

2012 年 9 月までの間、プロジェクトチームはナカラ港開発計画のレビューと我が国 ODA 事業に適したプロジェクトパッケージの調整に注力した。モザンビーク側は、本件に関するプロジェクトチームのプレゼンテーションによりプロジェクトのパッケージングの理由について理解を深め、その内容に基本的に同意した。この過程は、港湾計画に関する技術移転の一環と位置付けられる。その後は、ODA プロジェクトの実施は政府間の協議事項となったので、プロジェクトチームはより一般的な計画手法の技術移転に重点を移した。ナカラ港の将来のニーズに対応するため、穀物ターミナルについての一般的計画手法の技術移転も行った。

既存のコンテナヤードの混雑が悪化しているため、プロジェクトチームは CDN が港外に所有するドライターミナル（オフドックヤード）の視察を行い、同ターミナルの機能向上

に向けた提言を行った。

2)　港湾管理運営

2013 年 4 月以降、プロジェクトチームはナカラ港規則（CDN の港長により起案されたが未施行のもの）のレビューを行ってきた。同規則がカバーする範囲は広いが、2013 年 4 月のワークショップにおいては安全規則、同年 6 月のワークショップにおいては港湾運営規則にそれぞれ重点を置いて議論した。2013 年 12 月、CDN はプロジェクトチームのコメントの一部を反映して安全規則案を改定した。これに対し、プロジェクトチームはコンテナ貨物荷役、一般貨物荷役に関連した追加の提言を行った。無償資金協力のプロジェクトの開始が迫っているため、モザンビーク側は安全規則の完成が緊急に必要であることを理解した。

港湾運営規則についてプロジェクトチームは、一般貨物とコンテナ貨物の間では書類手続きが異なることに配慮した既定の追加が必要である旨の助言を行った。

2013 年 4 月以降、プロジェクトチームはナカラ港のマーケティング機能の強化にも重点を置いてきた。CDN と PN のマーケティング機能は弱く強化が必要なためである。このため、ワークショップにおいては港湾振興にとどまらずサービスの質や価格設定を含めたマーケティング機能全般についての講義を行った。

3)　港湾荷役

2013 年 12 月、プロジェクトチームは Phaeros に下記の機能が導入されるべきである旨助言を行った。これらの機能は PN のコンテナターミナル担当事務スタッフの労力を削減するだけでなく、コンテナのヤード内位置の入力のミスをなくす効果がある。

- ゲートで輸出コンテナを受け取った際の自動ヤード内位置指定プログラム
- ヤード内でコンテナを移動した場合の自動ヤード内位置指定プログラム

コンテナターミナルの効率性を上げ Phaeros の機能を発揮させるためには、PN は関係する機能の再編強化を行うことが必要である。これには、書類チーム （船社、荷主、トラック業者、税関等のユーザーとの間でデータのやり取りを扱う)、コンテナヤードのオペレーション・コントロールチーム（シッププラン担当者と協働してヤード内のすべての作業のプラニング、コントロールを行う)、シッププランチーム（ヤードプラン担当者と協働して本船関係のすべての作業のプラニングを行う）が含まれる。

2013 年 12 月、プロジェクトチームは CDN のドライターミナルの改良計画を作成し、モザンビーク側に提供した。これによりヤード舗装の完了後実入りコンテナの取り扱いが可能となる（図 3.5-5)。この改良により、平均 4 段積みを前提とした場合、ドライターミナルの最大取り扱い能力は現在のほぼ 3 倍の 3,640 TEU に達し、実用上の取り扱い能力も 2,730 TEU に達する。この場合、A から F までのブロックは船社、サイズ、高さにより整理して空コンテナの保管に用いることが適当である。一方、G から L までのブロックは BL 番号と荷主により分類された実入り輸入コンテナの保管に適している。

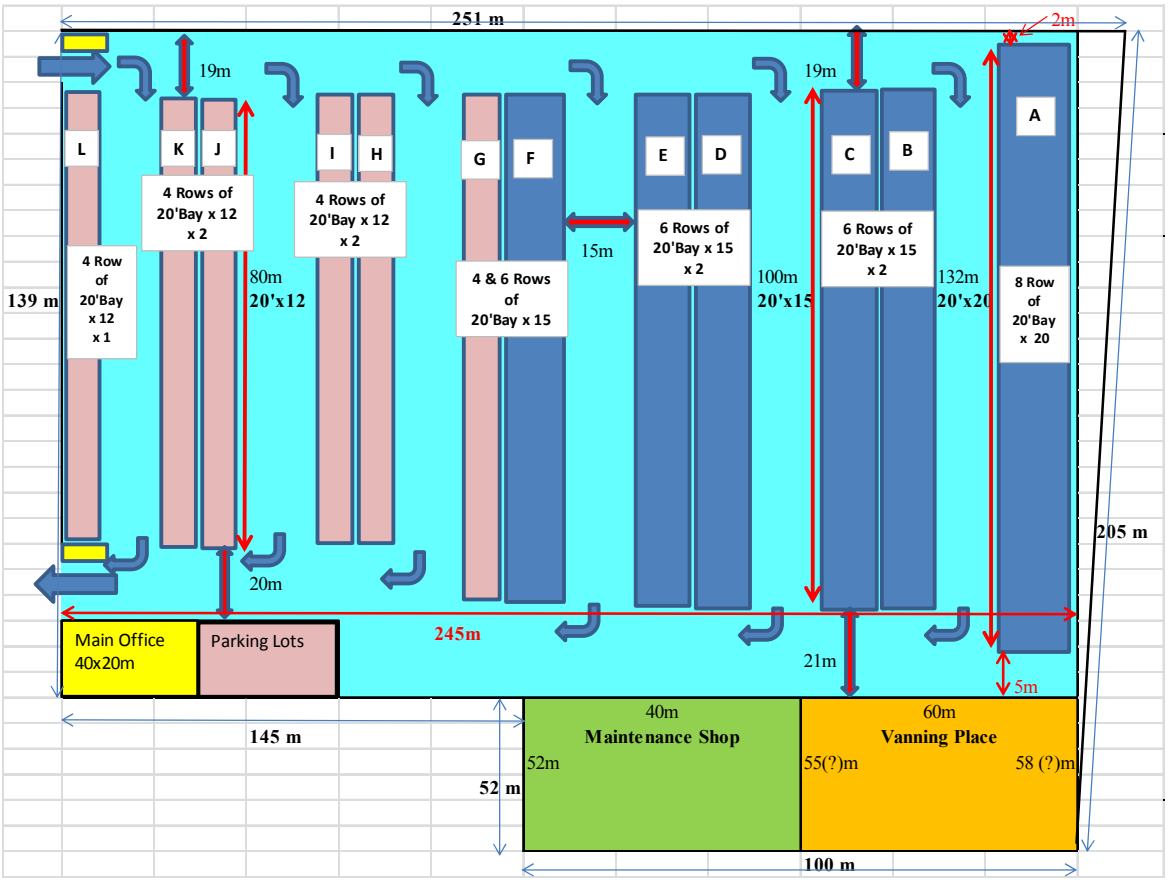


図 3.5-5 CDN のドライターミナル改良案

4) 土木施設の維持管理

2013 年 4 月までの間､カウンターパートとして土木技術者が指名されていなかったため､土木施設の維持管理に関する研修は机上の講義のみ行われてきた。その中で、日本の港湾で採用されている維持管理計画の作成方法について理論的な講義を行った。

2013 年 6 月、カウンターパートとして CFM の 3 人の土木技術者が指名された。これはモザンビーク側が土木施設の維持管理への関心を高めたものと評価される。このため 6 月の派遣においては、維持管理のより実務的な側面に重きを置くとともにカウンターパートと合同で施設点検を行うことにより、モザンビーク側参加者が土木施設の現状を自ら把握できるよう努めた。

これ以降モザンビーク側は積極的な活動を開始した。2013 年 12 月の第 7 回派遣において､モザンビーク側は構造物の点検･維持管理計画（PN）及び南埠頭の現地点検報告（CFM）の発表を行った。土木施設の維持管理に関し､持続性が向上しつつあるものと評価できる。

5) 荷役機械の維持管理

2013 年 6 月の第 6 回派遣までの間、プロジェクトチームはターミナルオペレーションシステムの基礎についての講義を行い、カウンターパートがナカラ港のターミナル効率改善計画を立案できるように努めた。12 月の第 7 回派遣の際にはシステムが本格稼働できるよ

うさらに助言を与えた。

プロジェクトチームは、留保予算を用意してスペアパーツや緊急交換部品が円滑に購入できるようにすることが重要であること、荷役機械の不稼働時間を削減するため部品の購入権限をメンテナンス部門に与えること、が重要であること旨助言してきた。第 7 回派遣の際、PN は留保予算システムを導入したと発言した。また PN は購入手続きの改善により荷役機械の稼働率が大きく改善したとの報告を行った。

(5) プログレスレポート 5（2014 年 9 月）

本報告書は、2014 年 4 月から 8 月までのプロジェクトの進捗を取りまとめて第 9 回派遣（2014 年 9 月）の際に提出したものである。この期間中に JICA は第 8 回派遣（2014 年 4 月）を行った。モザンビーク滞在期間中に、プロジェクトチームは 11 回のワーキングセッションを開催し延べ 99 人のカウンターパートが参加した。また、7 月 27 日から 8 月 9 日までの間、最終回となる本邦研修を行った。

また、プロジェクトチームとモザンビーク側カウンターパートは合同で現地踏査及び点検を実施した。プロジェクトチームはプロジェクト開始時に合意された PDM (Project Design Matrix) に沿った進捗状況評価を行い、両者は 2014 年 4 月 28 日にナカラで開催された取りまとめ会議においてプロジェクトが順調に進捗していることを確認するとともに、プロジェクト目標の達成に向けて今後とるべき方策について合意した。

進捗した事項

両者は以下の進捗があったことを確認した。

- ✓ 港湾計画分野については、我が国の ODA による「ナカラ港緊急改修計画」が開始され、期待される効果を収めた。
- ✓ 港湾管理運営分野については、安全規則案、港湾運営規則案の作成等大きな進歩がみられる。
- ✓ 港湾荷役分野については、Phaeros の改良、ドライターミナルの機能強化、スプレッダーの購入などの面で大きな進歩がみられる。
- ✓ 維持管理分野については、CFM と PN における土木技術者の配置、荷役機械の不稼働時間の減少等一定の進歩がみられる。

今後必要な措置

両者は、ナカラ港のポテンシャルを発揮させるため、以下の措置が取られるべきであることにつき合意した。

- ✓ 港湾計画分野については、本プロジェクトのスコープの外で、ナカラ港の周辺地域の状況変化に応じた新たなマスタープランの策定が必要である。

- ✓ 港湾管理運営分野については、安全規則案、港湾運営規則案を最終のものとし、速やかに施行することが必要である。関係機関の責任分担を明確にするため、コンセション契約の改定を完了することが必要である。

- ✓ 港湾荷役分野については、Phaeros の継続的な改良と実行をモニターすることが必要である。Phaeros は自動のヤード計画機能を有さないので、ヤードプラン担当者を相当の期間の海外研修または実地での OJT により養成することが必要である。国際的に一般的な 3 つの指標（バース効率、クレーンあたりグロス荷役効率、クレーンあたりネット荷役効率）によりコンテナ荷役効率をモニターすることが必要である。

- ✓ 維持管理分野については、土木施設の定期点検を直ちに開始する必要がある。プロジェクトチームは、第 9 回派遣の際に当該分野の実地研修を行う。南埠頭の補修に関し、プロジェクトチームの提言を参考にしつつ追加調査と方針決定を行うことが必要である。荷役機械の不稼働時間をさらに減らすため、スペアパーツの調達を迅速化する必要がある。

3.6 合同調整委員会（JCC）

合同調整委員会（JCC）は、関係機関の調整を行うために設置された。JCC はプロジェクト期間中に 4 回開催され、ワークプランの承認、プロジェクトの進行の確認、プロジェクトの評価を行った。

JCC は以下のメンバーにより構成された。

[日本側]
- ✧ JICA 専門家
- ✧ JICA モザンビーク事務所
- ✧ 日本大使館（オブザーバー）
- ✧ その他両者が同意した者

[モザンビーク側]
- ✧ 運輸通信省プロジェクト局長（MTC）
- ✧ モザンビーク港湾鉄道公社局長（CFM）
- ✧ 北部回廊開発会社局長（CDN）
- ✧ その他両者が同意した者

JCC の主な議題及び討議結果は以下の通り。

	開催日	主な議題と討議結果
第 1 回	2012 年 4 月 23 日	1) ワークプランの承認 プロジェクトチームの提案通り承認された。 2) モザンビーク側カウンターパートの指名 MTC、MOE、CFM、CDN から計 14 名が指名された。 3) コンテナヤード計画、バースアロケーション計画の承認 2018 年までの配置計画、バースアロケーション計画を承認した。 4) 第 1 回本邦研修計画の承認 第 1 回派遣、第 2 回派遣の際にプロジェクトチームが把握したニーズに基づき策定することとした。
第 2 回	2012 年 9 月 20 日	1) 開始後 6 か月間の進捗状況の確認 段階整備計画、10 項目の緊急改善提言、技術移転計画についてのプロジェクトチームの報告を了承した。 2) モニタリング指標の確認 ナカラ港の現状を踏まえて港湾計画、港湾管理運営、港湾荷役、施設維持管理、機械維持管理の各項目についてモニタリング指標を設定した。 3) ナカラ港整備に関する討議

	開催日	主な議題と討議結果
		ナカラ港の運営形態の変更の動向を緊密にフォローしていくこととなった。
第 3 回	2013 年 12 月 19 日	1) プロジェクトの進捗状況の確認 維持管理計画の作成、インフラの現地点検実施、荷役機械稼働率の改善、ターミナルオペレーションシステムの改良等が進捗していることを確認した。 2) ナカラ港の効率性を改善するため必要な措置の確認 コンテナ荷役効率の改善、ドライターミナルの有効活用、インフラの定期点検開始、南埠頭の改修計画の決定等の措置が必要であることを確認した。
第 4 回	2015 年 2 月 10 日	1) プロジェクトの成果の確認、評価 ナカラの現地で確認した最新のデータにより作成された PDM 及びモニタリング指標を用いてプロジェクトの成果の評価を行い、プロジェクトの目標が達成されたことを確認した。 2) 技術移転のフォローアップ モザンビーク側がナカラ港の一層の改善のため JICA の技術協力を求めたのに対し、JICA は短期専門家の派遣及び海外研修により支援したい旨応じた。

3.7 セミナー

本プロジェクトの成果をナカラ港の関係者に広く周知するとともに、港湾運営改善の取り組みに向けた関係者の参加を促すことを目的に開催した。セミナー参加者は 40 名を超え、日本側の発表に加えモザンビーク側から 5 件の発表があるなど、カウンターパートの積極的参加がみられた。

(1) 日時、場所

2 月 5 日、於ナカラ

(2) 主催者

MTC 及び JICA の共催

(3) 参加者

- モザンビーク側：MTC、CFM、CDN、PN、TN、税関、入管、ナカラ港利用者等計 35 名
- 日本側：JICA、プロジェクトチーム計 6 名

(4) 発表

- プロジェクトチーム（岡田光彦）：ナカラ港改善プロジェクト
- CFM（Mr. Arzilio Josué Mata）：ナカラ港改善プロジェクト
- CDN（Mr. Ibraimo Mussa）ナカラ回廊のゲートウェーとしてのナカラ港の機能強化
- PN（Mr. Neimo Induna）：ターミナル運営の改善
- 船社（Mr. Hinelder Ferreira（CMA CGM）及び Mr. Simon Kanjanga（MSC）：ナカラ港への期待

3.8 プロジェクトフロー

プロジェクトは、おおむね別添の業務フローチャート（図 **3.8-1**）に沿って実施された。

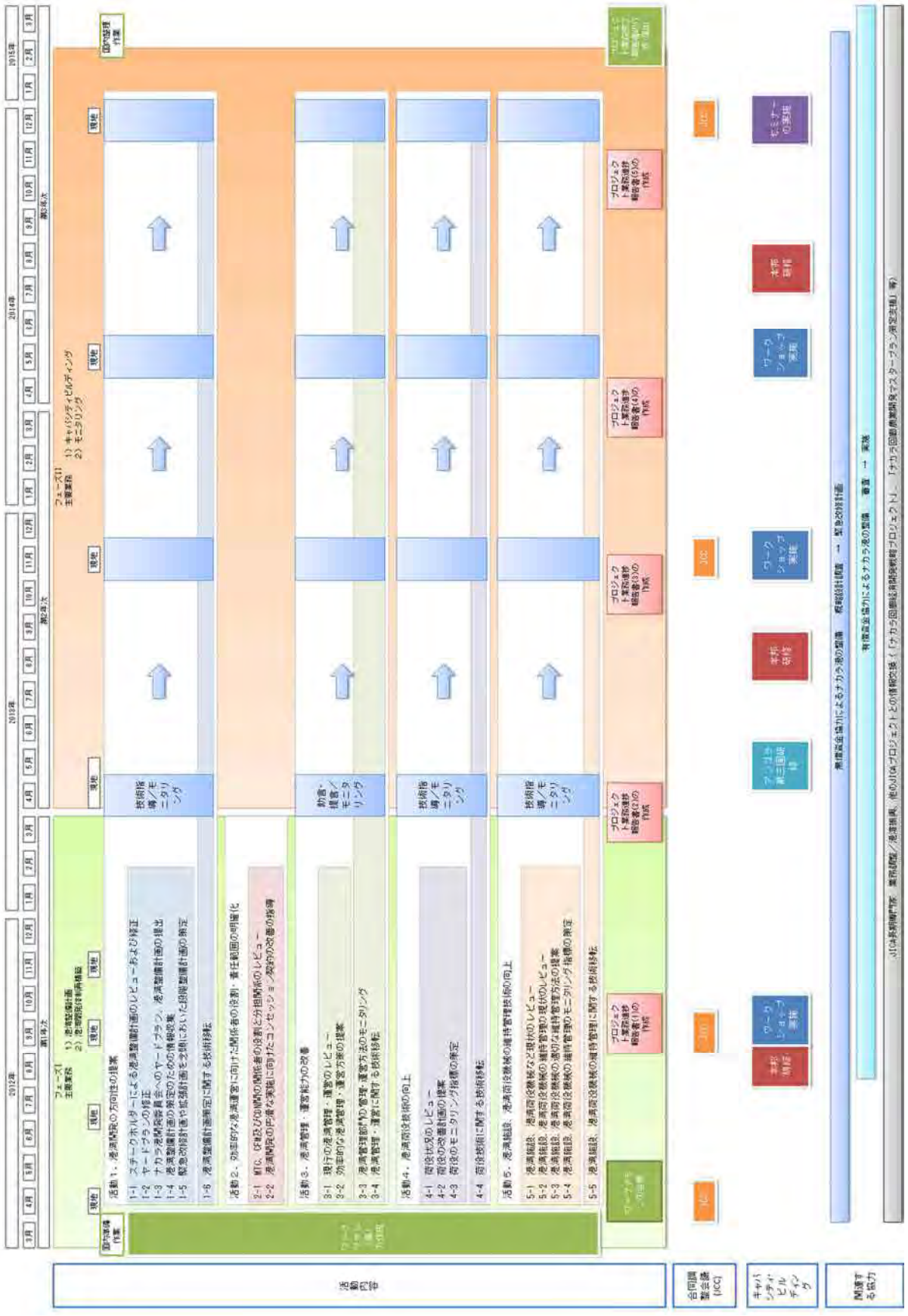


図 3.8-1 業務フローチャート

3.9 業務スケジュール

業務スケジュールは別紙（図 3.9-1）の通り。

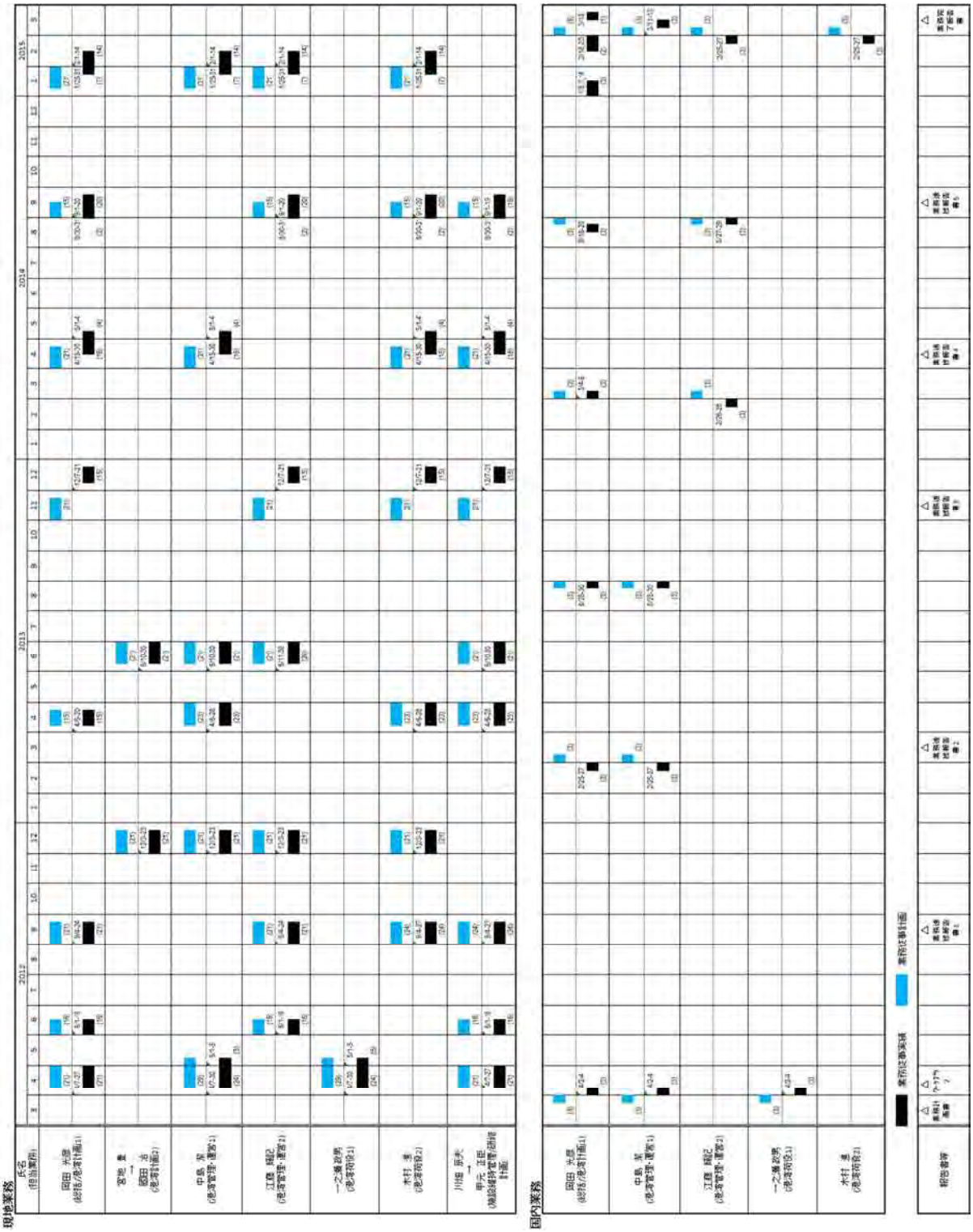


図 3.9-1　業務スケジュール

3.10 プロジェクト管理

プロジェクトを円滑に実施するため、活動は分解されて WBS の形に表現された（図 3.10-1～図 3.10-5）。プロジェクトの進捗は WBS に沿ってモニターされた。WBS のレベル 1 は PDM に規定された期待される効果、レベル 2 は活動の成果の概要、レベル 3 はプロジェクト管理単位、レベル 4 は活動のグループ、レベル 5 は個々の活動である。

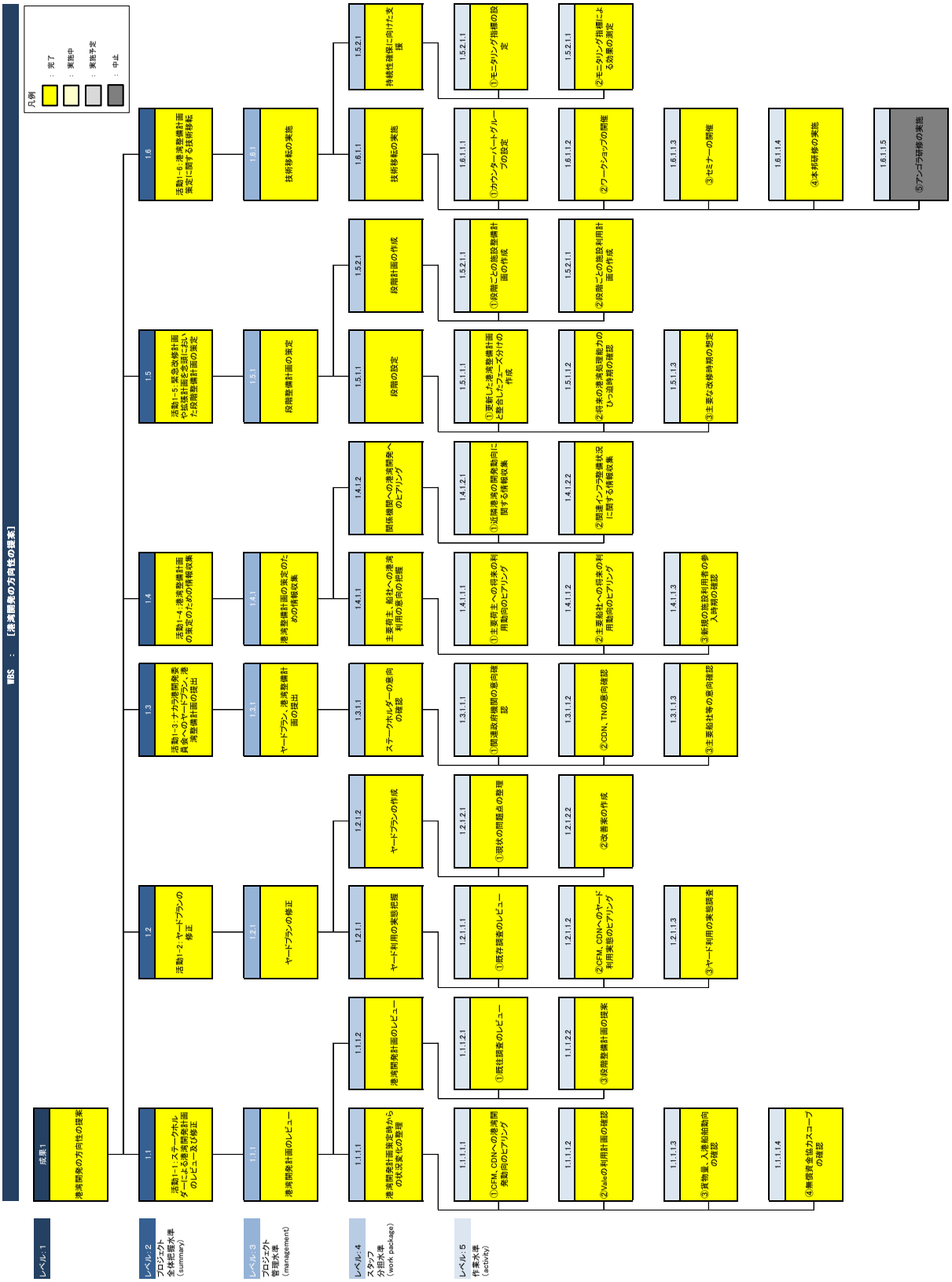


図 3.10-1　WBS（その１）

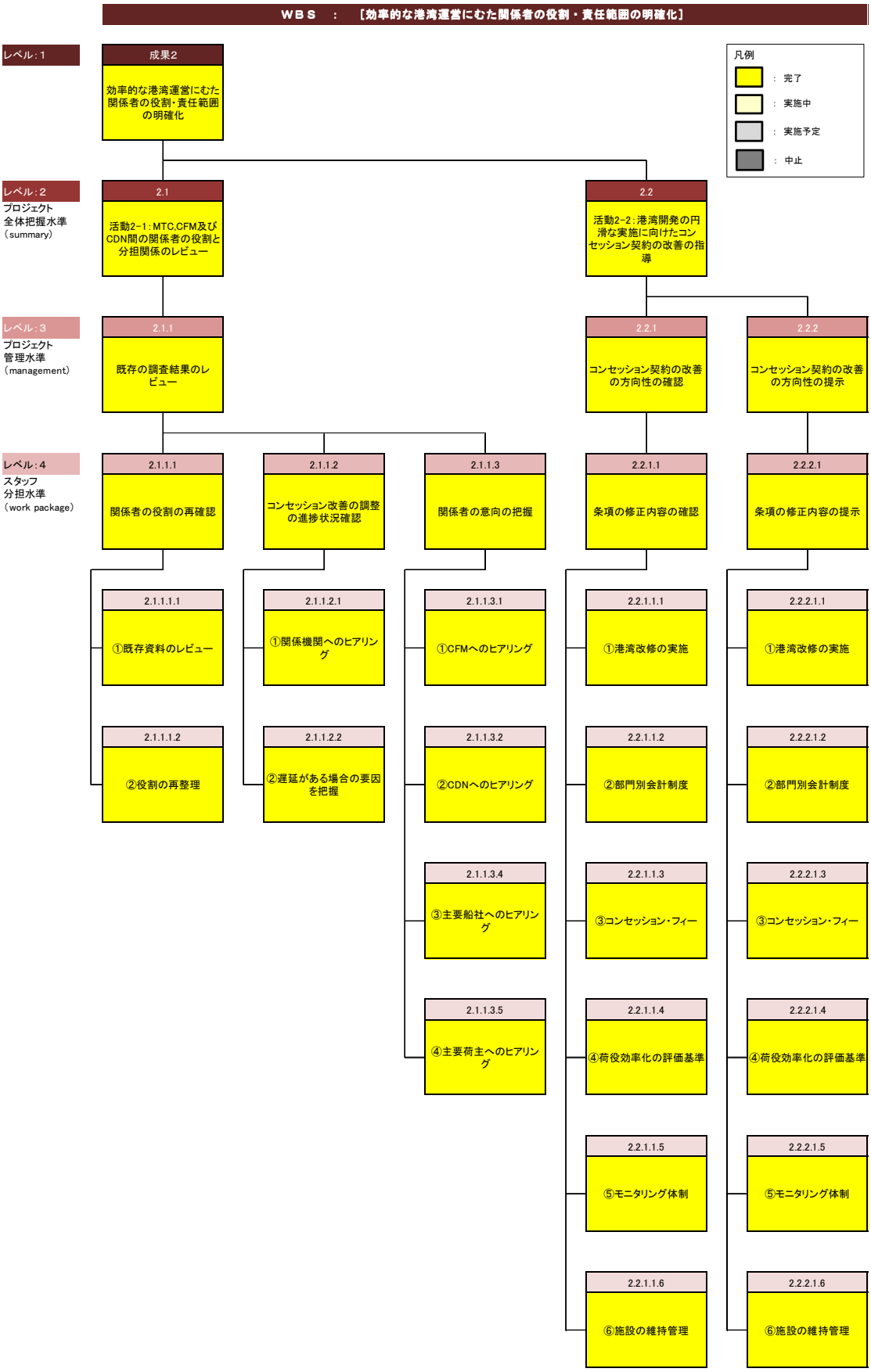


図 3.10-2　WBS（その２）

図 3.10-3　WBS（その３）

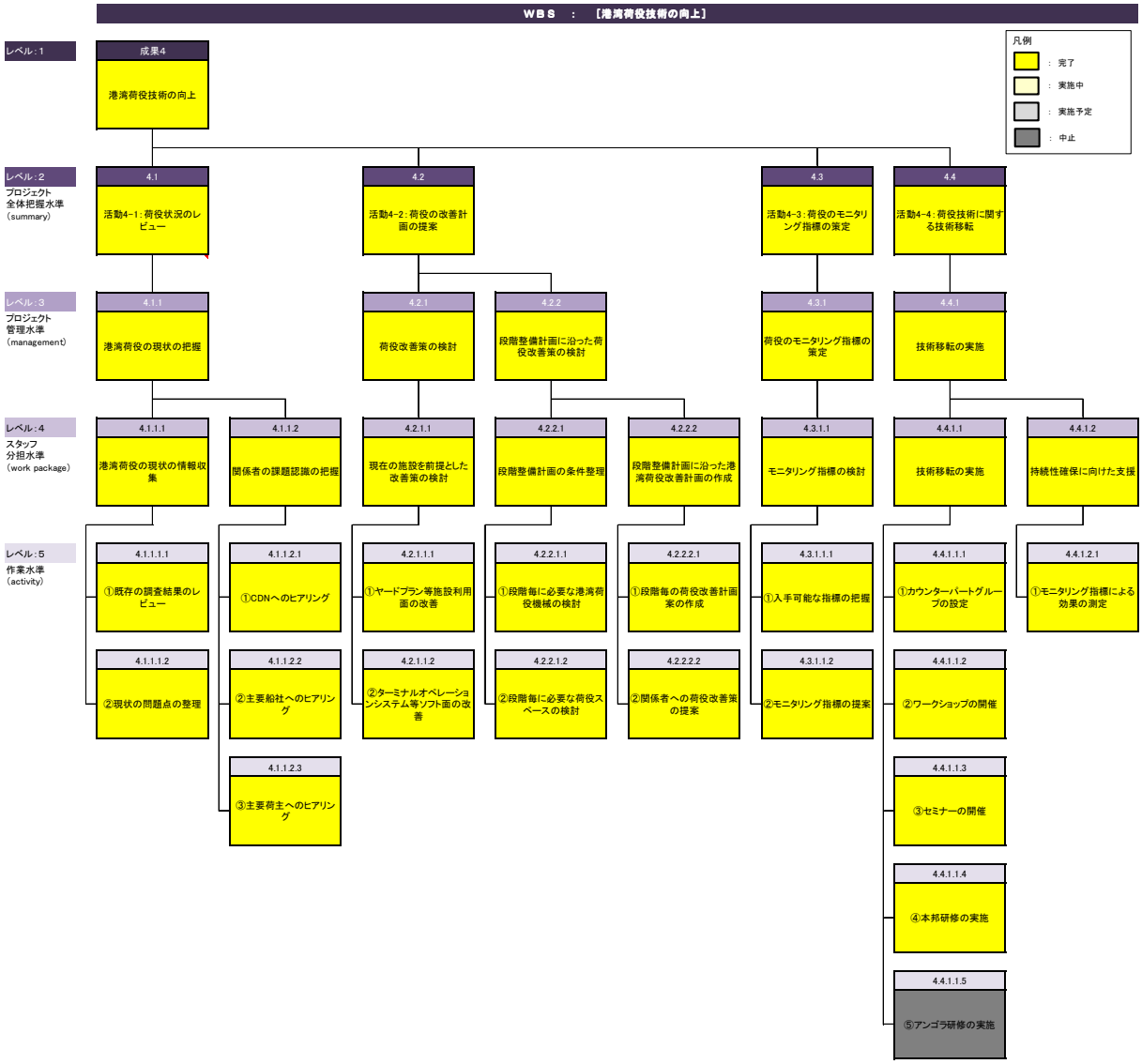


図 3.10-4　WBS（その４）

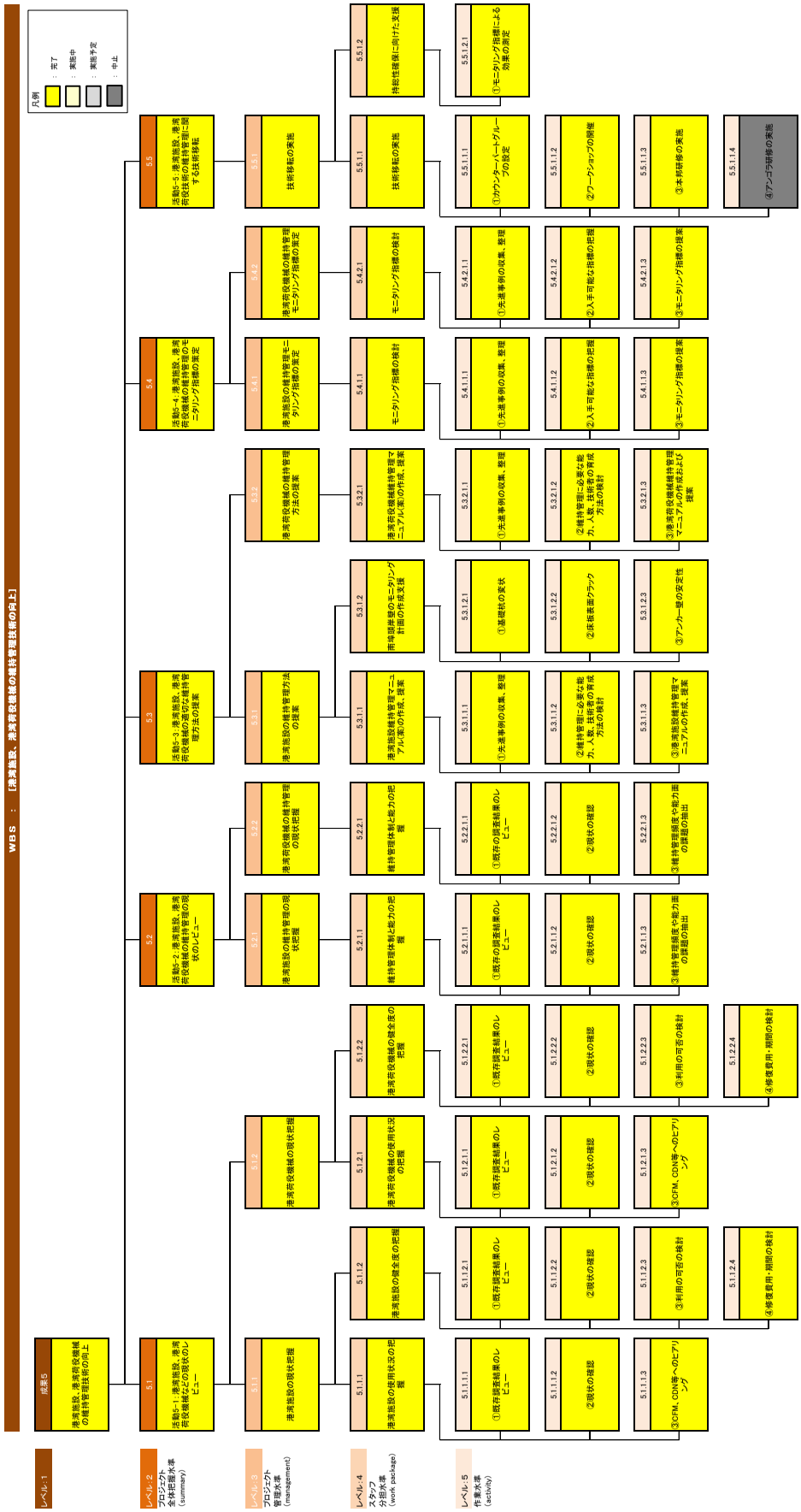


図 3.10-5 WBS（その５）

4. プロジェクトの成果

4.1 PDM に基づく評価

(1) 2014 年 9 月第 9 回派遣時点の評価

プロジェクトチームは、プロジェクト開始時に合意された PDM (Project Design Matrix)にそって、プロジェクトの進捗の評価を行った。2014 年 9 月 18 日のラップアップ会議において、プロジェクトチームとモザンビーク側カウンターパートは、プロジェクトの進捗と今後必要な措置について合意した。

進捗した事項

両者は以下の進捗があったことを確認した。

- ✓ 港湾計画分野については、我が国 ODA プロジェクトが開始され、期待される効果を収めた。
- ✓ 港湾管理運営分野については、安全規則の施行及び港湾運営規則案の作成等、大きな進歩がみられる。
- ✓ 港湾荷役分野については、Phaeros の改良、ドライターミナルの機能強化、スプレッダーの購入などの面で大きな進歩がみられる。
- ✓ 維持管理分野については、CFM と PN における土木技術者の配置、荷役機械の不稼働時間の減少等一定の進歩がみられる。

今後必要な措置

両者は、ナカラ港のポテンシャルを発揮させるため、以下の措置が取られるべきであることにつき合意した。

- ✓ 港湾計画分野については、本プロジェクトのスコープ外で、ナカラ港の周辺状況の変化に対応したナカラ湾全体を包含するナカラ港土地利用計画を作成することが必要である。ナカラ港のマスタープランはこの一部となる。
- ✓ 港湾管理運営分野については、港湾運営規則案を最終のものとし速やかに施行することが必要である。関係機関の責任分担を明確にするため、コンセション契約の改定を完了することが必要である。安全に関しては、ODA 事業の実施期間中さらに注意を払う必要がある。また、発生した事故から得られる教訓を全職員に周知することが望ましい。
- ✓ 港湾荷役分野については、荷役効率の改善を継続的にモニターすることが必要である。Phaeros は自動のヤード計画機能を有さないので、ヤードプラン担当者を相当の期間の海外研修または実地での OJT により養成することが必要である。国際的に

一般的な 3 つの指標（バース効率、クレーンあたりグロス荷役効率、クレーンあたりネット荷役効率）によりコンテナ荷役効率をモニターすることが必要である。（Phaeros に関し、プロジェクトチームは遅かれ早かれ改良するか国際的に普及しているターミナルオペレーションシステムに置き換える必要があると考える。また、3-4 人のシッププラン担当者、ヤードプラン担当者（論理的な思考ができる者）を指名して海外研修または現地の OJT により養成することが必要と考える。OJT の場合、2-3 人の豊富な経験を有する専門家を海外から招へいして、少なくとも半年間研修にあたらせることが有効である（TN が利用している Spence Atkin はそのような専門家の供給源になりうる）。研修は、RTG を有する新コンテナターミナルの稼働までに完了しておくべきである。）

✓ 土木施設の維持管理については、モザンビーク側の土木技術者を海外研修または現地での OJT により養成することが必要である。また、モザンビーク側は ODA 事業により供与される機材の維持管理の準備を行うため、責任者を明確にすることが必要である。南埠頭の補修に関し、プロジェクトチームの提言を参考にしつつ追加調査と方針決定を行うことが必要である。

2014 年 9 月以降に取られた措置

✓ モザンビーク側のカウンターパートは、ナカラ港の改善を図るために積極的な行動を起こした。モザンビーク側は、南埠頭の将来利用計画に関してプロジェクトチーム及び JICA との技術的な会議の開催を要請し、両者は 2014 年 11 月東京において本件に関する意見交換を行い、今後詰めるべき事項を明らかにした。また、モザンビーク側は 2014 年 12 月に安全規則を施行した。本規則はプロジェクトチームの助言に沿って CDN が起案、2014 年 11 月に開かれた関係者を集めたセミナーで内容が周知された。これらの行動は、モザンビーク側の自律性が次第に向上していることを示している。

(2) 2015 年 2 月第 10 回派遣時点の評価

第 10 回派遣の際に PDM のアップデートを行った。2015 年 2 月 6 日のラップアップ会議及び引き続き 2 月 11 日に行われた第 4 回 JCC において、日本側とモザンビーク側は共同で PDM に基づくプロジェクトの達成度評価を行い、プロジェクトの目標が達成されたことを確認した（表 4.1-1）。

表 4.1-1 PDM に基づくプロジェクトの評価

Description of PDM		Achievements and future actions		
Narrative summary of outputs	Objectively verifiable indicators	Outputs up to January 2015	Evaluation of the progress as of January 2015	Forthcoming actions and recommendable actions (Items in parenthesis are out of the scope of the current TA project)
Port development strategy is developed	Port development strategy is drafted	# Revised port development plan was prepared and agreed on among pertinent parties (September 2012)		# (Master plan beyond the short-term development) # (Rehabilitation plan of the South Wharf)
The implementation structure of the short-term development is revised and established	Short-term development plan is revised	# Grant aid project started (March 2014) # Loan-1 project started D/D	Targets accomplished	
The capacity of the port administration and management is developed	# Regulation on port administration and management is drafted # Port is administered and managed according to the regulation	# Operational regulation and safety regulation are drafted # Safety regulation was announced to stakeholders in a seminar (April and November 2014), approved by the CDN board (June 2014) and then implemented (December 2014)	Targets accomplished	Operational regulation will be finalized and implemented (targeted for May 2015)
Cargo handling skill is improved	# Cargo handling capacity per hour increases # Accident rate decreases # Number of seminar/training and participants who pass the training exam increases	# Cargo handling efficiency is gradually improving through the introduction of Phaeros and segregation of containers which has resulted in a decrease in vehicle turn-round time # Accidents are recorded and preventive measures are analyzed # 190 counterparts participated in 16 sessions of lecture/discussions on cargo handling # Phaeros (terminal operation system) is operational and all agents are participating in the system # Leveling of the dry terminal was completed (September 2014) but severe rain falls caused damages requiring the terminal to be paved # New spreaders arrived (September 2014) and are now in use	Targets accomplished	# Wireless data transmission will be installed before mid-March # Container handling productivity needs to be monitored by 3 universally applied indicators # 4 yard planners will be hired # Lessons learned from accidents should be circulated among all employees
Maintenance skills of the port facility and equipment is developed	# Number of maintenance technicians increases # Maintenance cost for existing facility	# Three civil engineers (two from CFM and one from PN) are assigned for infrastructure maintenance # Counterparts received infrastructure monitoring	Targets accomplished	# Further study and policy decision on the rehabilitation of the South Wharf considering the suggestions of JICA Team # Compilation of an spare

Description of PDM		Achievements and future actions		
	and equipment decreases # Number of seminar / training and participants who pass the training exam increases	training using survey equipment (September 2014) # Downtime ratio of equipment decreased (from 39 % in 2012 to 21 % in 2014) # In daily operation meetings, equipment conditions are reported and shared among all people concerned # 110 counterparts participated in 15 sessions of lecture/discussions on infrastructure maintenance # Counterparts understood the survey and analysis needed to determine the measures to rehabilitate the South Wharf # A Mozambican delegation had a technical meeting on the South Wharf with Japanese counterparts in Japan (November 2014) # 94 counterparts participated in 10 sessions of lecture/discussions on equipment maintenance # Periodical maintenance plan for equipment is developed and implemented		parts inventory list

4.2 モニタリング指標に基づく評価

2012 年 9 月本プロジェクトにおいて、ナカラ港の改善の進捗をモニターするための指標が設定された。2015 年 2 月 6 日のラップアップ会議及び引き続き 2 月 11 日に行われた第 4 回 JCC において、日本側とモザンビーク側は共同でモニタリング指標に基づくプロジェクトの達成度評価を行い、ほとんどの指標は技術移転により大きな改善を示していることを確認した（表 4.2-1）。

表 4.2-1 モニタリング指標に基づくプロジェクトの評価

Subject	Indicators	Milestones/goals	Baseline	Achievements
Port development planning	Progress of investment packages	Start of Grant aid Start of Loan-1 Start of Loan-2	Investment packages not started yet as of April 2012.	Grant aid project started (March 2014) # Loan-1 project started D/D (May 2014)
Port administration and management	Number of participants in seminars and workshops	Training in Japan in 2012, 2013 and 2014 Training in Angola in 2013 Training in Nacala and Maputo		Training in Japan in 2012, 2013, 2014 (In total, 31 counterparts received technical transfer in Japan) Key counterpart training in 2013 substituted for Training in Angola
Cargo handling	1. Gross vessel productivity of container handling 2. Net vessel productivity of container handling 3. Net gang productivity of container handling 4. Dwelling time of containers	10 boxes (=13.0 TEU) /SG/hour as Net Productivity	1. 6.7 box/hour/vessel (2011) 2. 7.6 box/hour /vessel (2011) 3. 5.0 box/hour/gang (2011) 4. 8.55 days for transit containers (2012)	1. 8.2 box/hour/vessel (2014) 2. 10.6 box/hour/vessel (estimated by the Project Team, 2014) 3.6.3 box/hour/gang (estimated by the Project Team, 2014) 4. Average dwelling time is not recorded
Maintenance of facilities	Frequency of port area patrol (regular inspection)	Regular inspection is started Budget for maintenance is allocated.	No regular inspection No budgetary allocation	Inspection of infrastructure started in August 2014 MT 15,380,000 is requested to the management for FY 2015 budget
Maintenance of equipment	Working time ratio of equipment Annual budgetary allocation for facility maintenance	60-70 % Sufficient amount of budget	51.77 % (2012) MT 27,770,000 (2011)	79 % (2014) MT 92,369,000 is allocated in FY 2015 budget

5. 今後の技術移転の必要性

4 章に述べたように、プロジェクトは開始時に想定した成果を上げた。しかし、ナカラ港が経済環境の変化に対応していくためには、さらにその効率性を向上させていくことが必要である。第 4 回 JCC において、JICA とモザンビーク側はプロジェクトの進捗及び今後の技術移転の必要性について意見交換を行い、JICA が短期専門家派遣及び研修員受け入れにより対応することで合意に達した（表 5-1）。

表 5-1 第 4 回 JCC で合意された JICA の技術移転プログラム

項目	内容	備考
Form of Technical Assistance	Dispatch of short-term Japanese experts and overseas training of counterparts	Not as the form of project type
Field of Experts	1) Port Administration 2) Terminal Operation 3) Infrastructure Maintenance 4) Equipment Maintenance	The first dispatch will be around June 2015 taking into considerations the lead time for procurement
Duration	2 Years (Start from around June 2015)	
Frequency of Dispatch	About 3 weeks at one time About 3 times a year (About 6 times in 2 years in total)	1) Timing of each dispatch will be decided in a timely manner 2) Seminar and/or workshop can be held as necessary
Counterpart Agency	1) MTC 2) CFM 3) CDN 4) PN	

6. 結論と提言

6.1 結論

4 章で述べたように、本プロジェクトは初期の目標を達成し成功裏に完了した。また、プロジェクト期間中にモザンビーク側において日本の技術移転に対する期待と信頼が高まったため、モザンビーク側は 5 章に記したように継続的な日本の技術移転を求めることとなった。ここに至る経過と背景を以下に整理する。

(1) 第 1 期－ODA プロジェクトのパッケージングと信頼関係の醸成

本プロジェクトは 3 年間にわたり、10 回の専門家派遣を行ったが、内容的に大きく二つの期間に分けられる。すなわち、第 1 回派遣（2012 年 4 月）から第 3 回派遣（2012 年 9 月）までの「第 1 期」と第 4 回派遣（2012 年 12 月）から第 10 回派遣（2015 年 1 月）までの「第 2 期」である。第 1 期は、「ナカラ港開発事業準備調査」が提案したナカラ港の施設改善計画について、我が国の資金協力スキーム、モザンビーク側の要望、改善の緊急性等の観点からそのコンポーネントを再整理し、無償資金協力、ローン 1、ローン 2 という 3 つのプロジェクトパッケージにまとめる作業である。コンポーネントの再整理及びプロジェクトのパッケージ化を行うに当たっては、日本側専門家とモザンビーク側カウンターパートが合同で現地踏査を行う（第 1 回派遣）とともに、専門家からの我が国の資金協力スキームや個々のコンポーネントの緊急性についての説明を踏まえ、両者が綿密な意見交換を行った。これにより、モザンビーク側は日本側提案のプロジェクトパッケージが合理的なものであることを理解し、両者が大筋で合意するに至った（第 3 回派遣）。

この過程は、1）両者が合意できる ODA プロジェクトパッケージを整理し、以後の事業実施を促進する。 2）合理的な施設改善計画の立案に関してカウンターパートへ技術移転する。 3）合意に至るまでのディスカッションにより両者の信頼関係を構築する。という三つの意義を有していた。三番目に挙げた信頼関係の醸成は先の二つに劣らぬ重要性を持っており、これにより「第 2 期」の技術移転が円滑に進めるうえでの基盤が形成された。

(2) 第 2 期－技術移転とモザンビーク側カウンターパートの自主性の醸成、サステナビリティの確保

「第 1 期」の最後にあたる第 3 回派遣（2012 年 9 月）の際にカウンターパートから、今後は技術移転、人材養成に重点を置いてほしいという発言があった。プロジェクトチームから 3 回の派遣を踏まえた 10 項目の緊急改善項目を提案したのに対して、モザンビーク側から内部の会議を開いて具体的な技術移転要望を取りまとめたいという反応があり、12 月に詳細な要望が日本側に提示された。この時点から、カウンターパートは技術移転に関する強い意欲と自主性を発揮し始めたと言える。この背景として、モザンビークの主要港は外国資本参加（マプトはドバイ、ベイラはオランダ）による運営が行われているところ、ナカラ港については外国資本の入らない PN が運営することにより、モザンビーク人によ

って港を運営していきたいという強い意欲がある。このためモザンビーク側は、専門家からの技術移転をナカラ港関係者だけではなく広い範囲に裨益させたいという考えを持ち、専門家派遣の際には、ナンプラ、ペンバなど周辺地域の職員も数多く参加した。

第 2 期の技術移転は、港湾整備運営に関する一般的な指導（2012 年 12 月）を行った後、ナカラ港が抱える課題や緊急に改善すべき事項に的を絞った内容として実施した。技術移転手法は、専門家からの一方向の講義は控えめにする一方、専門家からの提言に対するカウンターパートからの対応策の発表やディスカッション、合同の現場モニタリングの量を増やすことにより、カウンターパートの自律的発展を目指した。この成果は、第 10 回派遣の際に開催したセミナー（2015 年 2 月）の場でカウンターパート各機関がナカラ港の改善に関して自らの言葉で行ったプレゼンテーションとなって結実した。

プロジェクトチームは、各回の派遣の際に現場モニタリングやディスカッションを踏まえた要改善項目を提言した（例えば、第 3 回派遣の際の 10 項目、第 7 回派遣の際の項目）が、カウンターパートはこの提言に真摯に応えようという意志を示した(表 6.1-1)。安全規則の施行、ターミナルオペレーションシステム（Phaeros）の拡充、ドライターミナルの補修、スプレッダーの新調、インフラ維持管理計画の策定、荷役機械定期点検計画の策定などが実例として挙げられる。これは、プロジェクトチームの提言が評価されていること及び費用支出に対するトップマネジメントの意思決定が行われていることを示している。この過程において、カウンターパートチームのトップにあたる MTC のアナ・ディマンデ氏のリーダーシップは特筆に値する。

表 6.1-1　プロジェクトチームの提言とモザンビーク側の対応

第 3 回派遣時（2012 年 9 月）の提言	モザンビーク側の対応	第 7 回派遣時（2013 年 12 月）の提言	モザンビーク側の対応
モニタリング指標の設定	設定済み（第 3 回派遣時）		
MTC 及び CFM の港湾運営モニタリング機能の強化	従前は CDN 任せであったのに対し、MTC 及び CFM の関与が強化された		
CDN のマーケティング機能の強化	PN によるウェブサイトの開設（2013 年 8 月）、PN コウト社長の CMA CGM 本社訪問、マーケティング担当の配置		
ナカラ港運営規則の施行	運営規則案は作成され、2015 年 5 月頃施行見込		
フリッパー付きスプレッダーの使用による荷役効率改善	自作して試行したがコンテナの破損を招いた	フリッパー付きスプレッダーの調達	南アの専門業者に製造依頼した。現在さらに改修中
コンテナヤードの番地付け直し	取扱コンテナの増加により、荷役作業との調整がつかず断念	ターミナルオペレーションシステムの改良と運用開始	システム改良後、全船舶代理店の参加により稼動中
リーチスタッカーの追加	1 基追加（第 5 回派遣時に確認）		さらに 2 基追加
インフラ維持管理担当の土木技術者の雇用	PN によるアドバイザー（ポルトガル人）の雇用と PN 土木技術職員の維持管理業務への参加		
インフラの定期点検	定期点検計画作成を外注により作成した	外注により作成した計画に基づく定期点検開始とインフラ維持管理担当の土木技術者の雇用	プロジェクトチームの現場指導を受けて、点検を開始したが頻度は十分でない。CFM が 2 名、PN が 1 名の土木技術者を配置した。
荷役機械の維持管理計画作成	作成済み。メンテナンス技術者をスリランカから導入。		
		安全規則案の修正	MTC、JICA 共催によるセミナー開催後、2014 年 12 月に施行済み
		ドライターミナルの舗装計画策定	2014 年 9 月までに転圧を完了。大雨被害により改めて本格舗装工事が必要。
		外注した調査報告書に基づく南埠頭改修方法の検討	2014 年 11 月、モザンビーク側は技術ミッションを日本に派遣して日本側と意見交換
		3 つの指標による荷役効率の測定	プロジェクトチームが計算手法を指導済み

(3)　本邦研修－我が国技術の紹介と日本への理解の深化

本プロジェクト期間中に、4 回の本邦研修を行い、合計 6 機関 35 人のカウンターパートが日本を訪れ、我が国の港湾建設・港湾運営技術及び最新の世界の港湾・海運動向を学んだ。うち 1 回は、モザンビーク側の要望に沿って幹部職員 4 名を招いたものであるが、通常の研修プログラムのほか日本のビジネス関係者へのプレゼンテーションを行って両国経済関係の深化の一助となる等、有意義なものとなった。本邦研修参加者はいずれも、我が国の高い技術水準に感銘を受けるとともに、滞在を通じて日本の文化への理解や我が国への信頼を深めた。

(4)　我が国技術移転への期待と信頼

先述のとおり我が国技術移転への期待は第 3 回派遣（2012 年 9 月）の際に示されたが、ナカラ港のニーズに的確に対応しつつカウンターパートの自律的向上を目指すという日本の技術移転は、カウンターパートから高い評価を受けた。この結果、早くも第 7 回派遣（2014 年 12 月）の際に、カウンターパートから本プロジェクトの期間延長要望の意向が示された。このような我が国技術移転への期待と信頼の高まりを反映し、2014 年 11 月モザンビーク側代表団が自主的に来日して、課題となっている南埠頭の改修計画に関して日本側コンサルタントおよび JICA との意見交換を行った。

(5)　機動的な契約変更による現地ニーズへの対応

本プロジェクトは、「第 1 期」における ODA プロジェクトのパッケージ化に重点が置かれ、当初契約時点では全体 MM の約半分があてられていた。しかしながら、第 2 回派遣（2012 年 6 月）の際に MTC から、「各回の派遣の際にそれぞれ 4 分野（港湾計画、管理運営、港湾荷役、維持管理）の技術移転を行ってほしいとの要望が表明された。プロジェクトチームとしてもナカラ港のカウンターパートの能力及びハード・ソフトの実情に鑑みて、この 4 分野についての技術移転を行うことが重要であるとの認識を持った。特に、港湾荷役及び維持管理分野の技術移転ニーズが当初想定より大きいと判断した。この結果、プロジェクト期間を通じて技術移転の密度・頻度を上げ、かつバランスよく実施する事が本プロジェクト効果を発揮し定着させる上で肝要との観点から、契約変更による要員計画の拡充が実現した(表 6.1-2、表 6.1-3)。機動的な契約変更により、現地のニーズに沿いカウンターパートの期待にこたえる形での技術移転が可能となったと考える。

表 6.1-2　2012 年 11 月以降の専門家派遣計画（当初）

	2012 年度 （11 月以降）	2013 年度	2014 年度	合計
港湾計画	1	2	2	5
管理・運営	1	2	3	6
港湾荷役	0	1	1	2
維持管理	1	0	0	1

表 6.1-3　2012 年 11 月以降の専門家派遣計画（変更後）

	2012 年度 （11 月以降）	2013 年度	2014 年度	合計
港湾計画	1	3	3	7
管理・運営	1	3	3	7
港湾荷役	1	3	3	7
維持管理	1	3	3	7

(6) 調整員の配置

本プロジェクト期間のほとんど（2012 年 9 月から 2015 年 2 月まで）にわたり、ナカラの現地に調整員として栗林 JICA 専門家が配置された。本プロジェクトの技術移転プログラムのアレンジを円滑に進められたことは、ポルトガル語に堪能な同専門家が現地に駐在していたことに負うところが大きい。継続的な JICA 専門家のプレゼンスは、日本の技術協力に対する信頼関係を深めるうえでも大きな効果を上げたものと考える。

6.2 提言

(1) わが国技術協力の継続

3 年間の間に 10 回のプロジェクトチーム派遣、4 回のカウンターパート研修を実施し、ナカラ港の実情に合ったきめ細かい指導を行ったことにより、各カウンターパート機関担当者の間に、効率性や維持管理の向上に向けた意識の定着がみられ、技術者の配置、規則類の策定、施設の改良、調査実施など多方面の自主的な活動実施につながっている。カウンターパートの自律的・継続的能力向上を目指す日本の技術協力の方式は、高く評価されており、ODA による機材供与や施設整備が進み目に見える形となってきたこととあいまって、日本の協力への期待と信頼が深まっている。ナカラ港への技術協力を継続しこの成果を確実なものとすることは、意義深いと考える。幸い、第 10 回派遣（2015 年 1 月）の際、両者の間で技術協力の継続が合意されたが、今後ともカウンターパートの自律的・継続的能力向上を目指していくことが重要である。

6.1 で述べたように、本プロジェクト期間中は、ナカラの現地に調整員が配置され技術移転プログラムの円滑なアレンジに効果を上げた。今後の技術協力を進める間、調整員の配置がない場合は、カウンターパート機関（マプト及びナカラ）において同様の調整機能を発揮することが必要である。特に、モザンビーク側から強い要請のある港湾行政部門に関しては、政府が所管する業務であることから、首都のマプトにおいて実務的なカウンターパートが配置されることが不可欠となる。

(2) 上位目標の達成に向けて

「貿易・経済活動が促進され、ナカラ回廊地域が開発される。」という本プロジェクトの上位目標の達成のためには、ナカラ港が近代的な港湾として効率的なサービスを提供することが不可欠である。モザンビーク国北部においては、大規模な天然ガス田の開発が進められており、ガス・化学関係の産業振興も期待されるが、多くの雇用を創出し経済発展の効果を広く地域住民に均霑させるためには、ガス、石炭、農産品など背後の資源を活用した製造業の振興が必要となる。産業振興を支えるためには、ナカラ港が近隣諸港に伍して効率的なサービスを提供していくことが必要であり、我が国 ODA により整備されるインフラ・荷役機械がその効果を十分に発揮することが期待される。ナカラ港はガントリークレーンを有しないため、従来非効率な荷役を強いられていたが、我が国 ODA による北埠頭の整備、ガントリークレーン及び RTG を有する近代的なコンテナターミナルの整備により、

近代港湾の形を整えることとなる。カウンターパートはこれらの施設・機器の使用経験を持たないため、その効用を最大限に発揮させる上で、新ターミナルの立ち上がり時期における我が国の技術協力は効果が大きい。

(3) 港湾関連組織の強化

ナカラ港のインフラの定期モニタリングが進んでいないことの背景には、MTC、CFM、CDN、PN の 4 者の複雑な関係が十分整理され、それに沿った役割分担ができていないことがある。また、世銀の提言による港湾民営化、CFM のリストラの結果、モザンビーク国の港湾行政組織は弱体化している。無秩序な港湾開発を抑制する一方、モザンビーク国の国民経済の発展にとって有意義な港湾開発を進めていく核となる行政組織の拡充が望まれる。

7. 付属資料

Appendix-1: PDM（Project Design Matrix）
Appendix-2: 議事録
Appendix-3: タスクフォース議事録
Appendix-4: ナカラ港セミナー議事録（2015 年 2 月 5 日）
Appendix-5: 港湾統計資料

Appendix-1:　　PDM（Project Design Matrix）

ANNEX－1 : PDM(Tentative)
Title of the Project:PROJECT FOR IMPROVEMENT OF NACALA PORT
Target Area: Nacala Port　　Project Period: Feb 2012 – Feb 2015(Three years)　　Date: 19th December, 2011

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal To promote trade and economic activity and to develop the Nacala Corridor area.	GRDP in the Nacala corridor area, traffic volume in the Nacala corridow area (train, car)	Statistical data and analysis	
Project Purpose To improve efficiency of the Port	Carloadings amount, Loading time	Statistical data	
Outputs 1. Port development strategy is developed	1-1. Port Development Strategy is drafted	1-1 Exsitence of port development plan	
2. The implementation structure for short-term development is revised and established	2-1. Short-term Development Plan is revised	2-1 Exsitence of implementation structure	
3. The capacity of the port administration and management is developed	3-1. Regulation on port administration and management is drafted 3-2. Port is administered and managed according to the regulation	3-1 Exsitence of the concession contract	
4. Cargo handling skill is improved	4-1. Cargo handling capacity per hour increases	4-1. Statistical data	
	4-2. Accident rate decreases	4-2. Interview survey	
	4-3. Number of seminar/training and participants who pass the training exam increases	4-3. Statistical data	
5. Maintenance skill of the port facility and equipment is developed	5-1. Number of maintanance technician increases	5-1 Interview survey	
	5-2. Maintenance cost for exisiting facility and equipment decreases	5-2. Interview survey	
	5-3. Number of seminar/training and participants who pass the training exam increases	5-3. Statistical data	
Activities (1-1) To review and modify the existing port plan by stakeholder	**Input** **Japanese side**	**Mozambique side**	
(1-2) To modify existing yard plan	1. Experts	(a) Services of MTC' s counterpart personnel and administrative personnel	
(1-3) To submit modified plans to technical committee for Nacala port which has already been established in the Republic of Mozambique	JICA will provide the services of the Japanese experts	(b) Suitable office space with necessary equipment	
(1-4) To collect necessary information for future port development	(a-1) Dispatch of Expert (Long Term Expert)	(c) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the equipment provided by JICA	
(1-5) To formulate practical stage plan taking into consideration of rehabilitation and expansion plans	Coordination, Port Promotion	(d) Necessary information for the suitable furnished accommodation for the JICA experts and their families	
(1-6) To provide technical advice for port development	(a-2) Dispatch of Experts (Short Term Expert)	(e) Information as well as support in obtaining medical service	
(2-1) To review the roles and the responsibilities among MTC, CFM and CDN	Port Development Plan	(f) Credentials or identification cards	
(2-2) To develop instruction for revising the concession contract for smooth implementation of port development project	Port Administration and Management	(g) Available data (including maps and photographs) and information related to the Project	
(3-1) To review the present port administration and management	Facility and Equipment Maintenance	(h) Running expenses necessary for the implementation of the Project	
(3-2) To propose efficient port administration and management	Cargo Handling	(i) Expenses necessary for transportation within the Republic of Mozambique of the equipment as well as for the installation, operation and maintenance thereof	
(3-3) To monitor operation and management of administrative organization for administration	(c) Machinery and Equipment	(j) Necessary facilities to the JICA experts for the remittance as well as utilization of the funds introduced into the Republic of Mozambique from Japan in connection with the implementation of the Project	
(3-4) To provide technical advice for port administration and management	Necessary office machinery for office space		
(4-1) To review the situation of cargo handling	2. Counterpart Training in JAPAN and/or the third countries		
(4-2) To propose the improvement plan for cargo handling	Port Development Plan		
(4-3) To develop the indicators for monitoring of cargo handling	Port Administration and Management		
(4-4) To conduct technical transfer for cargo handling	Facility and Equipment Maintenance		
(5-1) To review the situation of the port facilities, cargo handling equipment, and so on	Cargo Handling		
(5-2) To review the maintenance situation of the port facilities, cargo handling equipment and so on.	Other necessary fields		
(5-3) To propose appropriate maintenance of the port facilities, cargo handling equipment and so on			
(5-4) To develop the indicator for monitoring the maintenance of the port facilities and cargo handling equipment			
(5-5) To conduct technical transfer for maintenance			

Appendix-2:　　議事録

1. 第 1 回 JCC (第 1 次派遣, 2012 年 4 月)

Conclusion
of
The First Joint Coordination Committee
for
The Project for Improvement of Nacala Port
in Republic of Mozambique

With regard to the Annex 1 of the "Record of Discussions on The Project for Improvement of Nacala Port in Republic of Mozambique Agreed upon between The Government of The Republic of Mozambique and Japan International Cooperation Agency" signed on December 22, 2011 (hereinafter referred to as "the R/D), the first meeting of the Joint Coordination Committee (hereinafter referred to as "JCC") for the Project for Improvement of Nacala Port in Republic of Mozambique (hereinafter referred to as "the Project") was held on April 23 following an on-site meeting in Nacala on April 16. The attendance list of the first JCC and the on-site meeting are attached hereinafter.

At the meeting of JCC, the Work Plan of the Project was presented by the JICA expert team for the Project (hereinafter referred to as "the Project Team"). Following the presentation and discussions, JCC approved the Work Plan.

Responding to the request of the Project Team, the Mozambican side assigned the following officials as counterparts:

(Planning/Administration)

Dr. Ana Dimande, Director of Nacala Port Development, MTC
Mr. Anibal Manave, Adviser of the Board, CFM
Mr. Christiano Oliveira, CFM
Mr. Agostinho F. Langa Jr., Executive Director of Port, CDN

(Capacity building)

Mr. Inacio Rodrigues Junior, CFM

(Operation/Cargo handling)

Mr. Danilo Laisse, MOE
Mr. Alfredo Artur Mafuca, CFM
Mr. Lucas Jose Cipriano, Operational Director, CDN
Mr. Freeman Dickie, Chief of Container Terminal, CDN

(Maintenance)

Mr. Orland Manhique, MTC
Mr. Francisco Rogerio Martins, Ship engineer, MTC
Mr. Antonio Frederico Candido, CDN

Mr. Afonso Vasco da Cunha Junior, CDN

(Statistics)

Mr. Ali Abdala, Statistics Staff, CDN

The Mozambican side requested that the training program should be further discussed between the Project Team and Mr. Inacio Rodrigues Junior, CFM. The Project Team responded that it would elaborate on the training program based on the needs of the Mozambican side it finds thorough the first and second visit to Mozambique and include the program in the Progress Report (1) to be presented in September 2012.

Based on discussions held in the on-site meeting on April 16, the Project Team proposed the future development strategy of Nacala Port up to 2018 including a layout plan and berth allocation plan. The Project Team explained that the urgent rehabilitation project would be a part of the future layout plan and act as the first step of the development strategy. The Project Team also stated that the rest of the port development components would need financing sources other than the Japanese grant aid. JCC basically accepted the proposal of the Project Team and requested that the Project Team further elaborate on the development strategy. The Project Team responded that the development strategy with reasoning would be included in the Project Progress Report (1).

JCC concurred on the importance and urgency of the development of Nacala Port. Recognizing the issues identified in R/D and Work Plan as Output 1 to 5, JCC agreed to work on those issues.

Maputo, April 23, 2012

Mitsuhiko Okada	Dr. Ana Matusse Dimande
JICA Team Leader	Coordinator,
The Project for Improvement of	Nacala Port Development Project
Nacala Port in Republic of Mozambique	Ministry of Transport & Communications

Participants of the 1st Joint Coordination Committee (Maputo, April 23, 2012)

Name	Organization	Position
Dr. Ana Matusse Dimande	MTC	Coordinator
Mr. Anibal Manave	CFM	Adviser of the Board
Mr. Inacio Rodrigues Junior	CFM	
Ms. Marilia ~~Beae~~ Bene	CFM	
Dr. Antonio Luis	MPD	Japan Desk
Ms. Jorgina Manhengane	Ministry of Energy	Advisor, Office of The Minister
Mr. Yuki Aratsu	JICA Headquarters	Deputy Director General, Economic Infrastructure Department
Mr. Yutaka Araki	JICA Headquarters	Economic Infrastructure Department
Mr. Kota Sakaguchi	JICA Headquarters	Assistant Director, Africa Department
Mr. Ryuichi Nasu	JICA Mozambique office	Resident Representative
Mr. Akihiro Miyazaki	JICA Mozambique office	Assistant Chief Representative
Ms. Harumi Maruyama	JICA Mozambique office	Assistant for Project Formation
Mr. Mitsuhiko Okada	JICA Expert	Team Leader / Port Planning (1)
Mr. Masao Ichinose	JICA Expert	Port Cargo Handling (1)
Mr. Kiyoshi Nakashima	JICA Expert	Port Management & Operation
Mr. Tatsuo Kawabata	JICA Expert	Facility & Equipment Maintenance / Training Coordination
Mr. Masafumi Ito	JICA Team (Urgent Rehabilitation)	Chief Consultant / Port Planning
Ms. Sanae Tanabe	JICA Team	Interpreter

Participants of the on-site meeting (Nacala, April 16, 2012)

Name	Organization	Position
Dr. Ana Matusse Dimande	MTC	Coordinator
Ms. Jorgina Manhengane	Ministry of Energy	Advisor, Office of The Minister
Ms. Natálie M.Teodor	Ministry of Energy	
Mr. Miguel Nhaca Gebuza	CFM	Executive Board Director
Mr. Anibal Manave	CFM	Advisor of the Board
Ms. Marilia ~~Beae~~ Bene	CFM	
Mr. Agostinho F. Langa Jr.	CDN	Executive Director of Port
Capt. Antonio F. Cândio	CDN	
Mr. Lucas Jose Cipriano	CDN	Operational Director
Mr. Mitsuhiko Okada	JICA Expert	Team Leader / Port Planning (1)
Mr. Masao Ichinose	JICA Expert	Port Cargo Handling (1)
Mr. Kiyoshi Nakashima	JICA Expert	Port Management & Operation
Mr. Tatsuo Kawabata	JICA Expert	Facility & Equipment Maintenance / Training Coordination
Mr. Masafumi Ito	JICA Team (Urgent Rehabilitation)	Chief Consultant / Port Planning
Mr. Isao Hino	JICA Team	Port Facility Design / Natural Condition Survey
Mr. Kazutoshi Tsuchiya	JICA Team	Cargo Handling Equipment Plan
Mr. Yuhei Yamamoto	JICA Team	Construction Planning / Cost Estimate
Mr. Yuji Hatakeyama	JICA Team	Environmental & Social Consideration
Ms. Sanae Tanabe	JICA Team	Interpreter

2. 第 2 回 JCC (第 3 次派遣, 2012 年 9 月)

Conclusion
of
The Second Joint Coordination Committee
for
The Project for Improvement of Nacala Port
in Republic of Mozambique

The second meeting of the Joint Coordination Committee (hereinafter referred to as "JCC") for the Project for Improvement of Nacala Port in Republic of Mozambique (hereinafter referred to as "the Project") was held on September 20 at the MTC office in Maputo. The attendance list of the second JCC is attached (Attachment A).

At the meeting of JCC, the JICA expert team for the Project (hereinafter referred to as "the Project Team") presented the progress of the Project for the first six months highlighting phased planning, areas in need of improvement, and technology transfer programs. The Project Team also presented what were discussed and suggested at the Work Shop held on September 11 at the CDN Nacala office. The meeting record with CDN Nacala is attached (Attachment B).

The Project Team requested that it would be kept informed of the change in the management and operation of Nacala Port so that it could properly respond to the needs of technology transfer on the Mozambican side.

JCC appreciated the progress of the Project and concurred on the importance and urgency of further technology transfer aimed to the improvement of Nacala Port. Toward this goal, the Project Team and the Mozambican side will jointly monitor the improvement of Nacala Port based on the monitoring indicators attached in Attachment B. The next visit of the Project Team is expected from December 4 to 22, 2012.

Maputo, September 20, 2012

Mitsuhiko Okada
JICA Team Leader
The Project for Improvement of
Nacala Port in Republic of Mozambique

Dr. Ana Matusse Dimande
Coordinator,
Nacala Port Development Project
Ministry of Transport & Communications

(Attachment A)

Participants of the 2nd Joint Coordination Committee (Maputo, September 20, 2012)

Name	Organization	Position
(Mozambican side)		
Dr. Ana Matusse Dimande	MTC	Coordinator
Eng. Anibal Manave	CFM	Adviser
Mr. Radames Bongece	CFM	Engineer
Ms. Carmen Paula Quembo	GAZEDA	Technical
Ms Jeorgina Manhengane	Ministry of Energy	Adviser
Mr. Joao P.M. Fernandes	Porto de Norte	Administrator Adviser
Mr. Fabio T. P. Duarte	CDN	Executive Adviser
(Japanese side)		
Mr. Akihiro Miyazaki	JICA Mozambique office	Assistant Chief Representative
Ms. Yukiko Ohno	JICA Mozambique office	Assistant for Project Formation
Mr. Mitsuhiko Okada	JICA Expert	Team Leader / Port Planning (1)
Mr. Tatsuo Kawabata	JICA Expert	Facility & Equipment Maintenance / Training Coordination
Mr. Teruki Eto	JICA Expert	Port administration and management (2)
Mr. Susumu Kimura	JICA Expert	Port cargo handling (2)
Mr. Nobuaki Kuribayashi	JICA Expert	Liaison officer
Ms. Rosa Machava	JICA team	Assistant

Meeting Records
of
The Project for Improvement of Nacala Port
in Republic of Mozambique

The JICA expert team for the Project (hereinafter referred to as "the Project Team") visited Nacala from September 8 to September 18, 2012. In addition to interviews, meetings, and site surveys, the Project Team held a workshop on September 11 at the CDN Nacala office as a measure of technology transfer to Mozambican counterparts (Attachment 1).

At the workshop, the Project Team made presentations on the first progress report, port planning, port operation and management, infrastructure maintenance, and equipment maintenance. The Project Team explained how project components were prioritized and bundled into three investment packages and made several suggestions aimed to improve Nacala Port. Following are main points of the suggestions in need of urgent attention.

1. Establishment of monitoring indicators (Attachment 2)
2. Strengthening of monitoring functions of MTC/CFM on the port's performance
3. Strengthening of marketing functions of CDN
4. Enforcement of the Regulation of Nacala Port
5. Achievement of higher container productivity using attachment with flippers and ropes
6. Renaming and striping of the container yard
7. Addition of reach stackers
8. Employment of civil engineers for infrastructure maintenance
9. Monthly maintenance of civil infrastructure
10. Establishment of a maintenance management plan for cargo handling equipment

The Mozambican side will take into account these suggestions in the future management and operation of Nacala Port. Both sides will jointly monitor the improvement of Nacala Port based on the monitoring indicators.

The Mozambican side will keep the Project Team informed as to how the transition of the management and operation of Nacala Port from CDN to Porto de Norte will be progressing. Accordingly, the Project Team will continue to tailor its technology transfer program to the needs

of the Mozambican side. The next visit of the Project Team to Nacala is expected from December 9 to December 20, 2012. Mr. Nobuaki Kuribayashi, a JICA expert, started his activity as the resident coordinator of the Project on September 5, 2012 and will act as a liaison officer for the Project.

Nacala, September 13, 2012

Mitsuhiko Okada
JICA Team Leader
The Project for Improvement of
Nacala Port

Mr. Agostinho E. Langa Jr.
Executive Director of Port
CDN

(Attachment 1)

Participants of the 1st Workshop in CDN Nacala

Name	Organization	Position
1. Braulio F Catutula	CFM - Norte	MGT& OPS officer
2. Eusebio A.R.logiveca	CDN – Port DNCL	Phaeros System Supervisor
3. Lucas Jose CePrian	CDN – Nacala Port	Port operations manager
4. Antonio Frederico Candido	CDN – Nacala Port	Maintenance Director
5. A. Langa	CDN	Port Director
6. Cristiono de Oliveira	CFM	Infrastructure Supervisor
7. Jose Jogfoim Lands	CFM - Norte	Delegado / NCL
8. Danilo A. Laice	Petromoc	Superintendence
9. W.G.D Nishantha	Terminas do Norte	Port Operation Manager
10. I.H.Sumbane	CDN - Nacala	CH maintenance service
11. Afonso Vasco da cunha junior	CDN - Port	Instalacoet Portuartis
12. Bonifacio A Muassabao	CDN - Porto	General cargo manager
13. Eusebio Armando	CDN - Porto	DOP-CCOP
14. Loni Shott	CDN	Logistics manager
15. Freeman Dickie	CDN	Container Terminal manager
16. Fernanda de Carvalho	Admar - Nacala	Accountant
17. A. Bafael Sigola	CFM	Mainatenance
1. Mitsuhiko Okada	OCDI	Team Leader
2. Teruki Eto	OCDI	Expert
3. Susumu Kimura	OCDI	Expert
4. Tatsuo Kawabata	OCDI	Expert
5. Nobuaki Kuribayashi	JICA	Expert

JICA The Project for Improvement of Nacala Port in Republic of Mozambique

(Attachment 2) Monitoring Indicators

Subject	Indicators	Milestones/goals	Baseline
Port development planning	Progress of investment packages	Start of Grant aid Start of Loan-1 Start of Loan-2	Investment packages not started yet as of September 2012.
Port administration and management	Number of participants in CP training in Japan Number of participants in seminars and workshops	Training in Japan in 2012, 2013 and 2014 Training in Angola in 2013 Training in Nacala and Maputo	10 counterparts received training in Japan in August /September 2012 Workshop was held in Nacala in September 2012 and attended by 17 Mozambican participants
Cargo handling	1. Gross vessel productivity of container handling 2. Net vessel productivity of container handling 3. Net gang /crane productivity of container handling 4. Dwelling time of containers	3. 10 boxes (=13.0 TEU) /ship gear/hour as net productivity 4. Dwelling time of 6.6 days	1. 6.7 box/hour/vessel (2011) 2. 7.6 box/hour /vessel (2011) 3. 5.0 box/hour/gang (2011) 4. 8.55 days (2012)
Maintenance of facilities	Frequency of port area patrol (regular inspection) Annual budgetary allocation for facility maintenance	Regular inspection is started Budget for maintenance is allocated.	Number of patrol is zero. Annual budget is zero.
Maintenance of equipment	Working time ratio of equipment Annual budgetary allocation for equipment maintenance	60 – 70 % Sufficient amount of budget is allocated	51.77% (as of 1 Jun 2012) MT27,770,000- (Year 2011)

3. 第 5 次派遣 (2013 年 4 月)

Progress
of
The Project for Improvement of Nacala Port
in Republic of Mozambique

The JICA expert team for the Project (hereinafter referred to as "the Project Team") visited Mozambique from April 7 to April 19, 2013. On April 10, The Project Team presented the progress and technical assistance plans of the Project to the Mozambican side in a meeting attended by representatives of MTC, CFM, CDN, and PN (The attendance list of the meeting is attached (Attachment A)).

1. At the meeting, the Mozambican side gave a presentation on the transfer of the port operation from CDN to PN.
2. PN expressed its commitment to achieve efficient and professional port operation following the suggestions of the Project Team emphasizing that PN's introduction of a new reach stacker in March was an example of the commitment.
3. The Mozambican side appreciated the progress of the Project and expressed its strong interest in receiving continued technical assistance from the Project Team. The Project Team expressed its intention to continue its technical assistance responding to the needs arising from recent developments surrounding Nacala Port. The Project Team also highly appreciated the Mozambican side's proactive actions in responding to the Team's suggestions aimed to improve Nacala Port.
4. The Mozambican side agreed to this year's counterpart training plan in Japan (One for three key counterparts planned in July and another for up to ten middle-level counterparts planned in September).
5. Both sides agreed that PN should appoint focal persons for the Project Management Unit for the following areas: port planning, port administration, cargo handling, and maintenance (The record of discussions of the meeting is attached (Attachment B)).

The Project Team gave several lectures at Nacala for Mozambican counterparts including participants from Pemba Port (The lecture program is attached (Attachment C)). The Team also carried out site inspections of infrastructure (South Wharf and North Wharf) and equipment as well as interviews and confirmed the latest monitoring indicators related to cargo handling and maintenance (February/March 2013) as follows:

1. Net crane/gang productivity: 7 Box/vessel/hour
2. Working time ratio of equipment: 67 %

The Project Team found that the South Wharf container yard area 30-m behind the quay line suffered significant settlement due to the continued deterioration the Wharf. The Team is therefore suggesting that the South Wharf deck structure should avoid excessive forces and/or loads (The Team's findings and suggestions are attached (Attachment D)). The use of heavy equipment on the South Wharf deck structure is not recommendable.

The Project Team suggested to the Mozambican side that a civil engineer of PN should be involved in the preparation and implementation of the maintenance action plan for infrastructure. The Project Team also requested the Mozambican side to regularly provide the record of latest monitoring indicators. The next visit of the Project Team is expected from June 4 to 22, 2013.

Maputo, April 18, 2013

Mitsuhiko Okada
JICA Team Leader
The Project for Improvement of
Nacala Port in Republic of Mozambique

Dr. Ana Matusse Dimande
Coordinator,
Nacala Port Development Project
Ministry of Transport & Communications

(Attachment A)

Technical Coordination Meeting of the Project for Development of Nacala Port

Date: 14:30 - 17:30, April 10, 2013

Venue: PN Conference Room

No.	Name	Title / Section	Org.
1	Ana Dimande	Project Coordinator	MTC
2	Jose Joaquim Daude	Representative	CFM
3	Paulo Tarmamade		CFM
4	Aderval Acioli	Port Operation	CDN
5	Fernando Couto	CEO	PN
6	Agostinho Langa	Operational Dierctor	PN
7	Matos Fernandes	Advisor	PN
8	Mitsuhiko Okada	JICA Expert/ Team Leader	JICA
9	Kiyoshi Nakashima	JICA Expert	JICA
10	Tatsuo Kawabata	JICA Expert	JICA
11	Susumu Kimura	JICA Expert	JICA
12	Nobuaki Kuribayashi	JICA Mozambique	JICA

April, 10th 2013

RECORD OF THE MEETING
ON NACALA PORT TECHICALL ASSISTANCE PROJECT

BETWEEN
JICA TECNHICAL ASSISTANCE TEAM
AND
MINISTRY OF TRANSPORT AND COMMUNICATIONS-PMU

The Port of Nacala is since 15th March 2013, under the management of a new Terminal Operating Company by subcontract between Corredor de Desenvolvimento Norte,SARL (the concessionaire with the Government of Mozambique for the Nacala Port and the Nacala railway system) and Portos de Norte (a Mozambican private company).

As follow up of the meetings held in Maputo on March, 22nd 2013 and April 2nd 2013 a technical coordinating meeting was held in Nacala on 10th April 2013 from 14.30hrs with JICA Technical Assistance Team (TAT) from OCDI (Overseas Coastal Development Institute of Japan) with the following objectives:

1. To Adjust and harmonize the Existing Plans and Programs of the Technical Assistance to the with the new management of the Port;
2. Present the Progress Report on the recommendations made by the TAT in September 2012
3. To Review the training Plan Out of Mozambique

The meeting was Chaired by the Project Coordinator and attend by representatives from CFM, CDN, Portos do Norte and the JICA TAT from OCDI (**the list attached I**).

Introductory Remarks
The chair person explained the objectives of the meeting and informed about the changes on the management of the Nacala Port.

Following the agenda Mr F Couto the chairperson for Portos do Norte did a brief statement of their commitment on the Nacala Port Development Project and presented the summary of challenges that count to encourage the project to continue be implemented, such as the need of the improvement of the capacity of the port . Informed that Portos do Norte purchase a new reach starker and the other one is to be placed before the end of 2013; Portos do Norte is in the process of introducing CCTV System for surveillance of the port area; there is ongoing activity to name the container yard and to introduce circulation ways for vehicles within the port.He also committed to assign a representative as counterpart to the project to work within the PMU.

CDN informed the conditions of the contract with Portos do Norte and the area of interventions and responsibilities of each company in the Ports and Portos do Norte were invited to present the Progress report (**attached II**) as the new entity directly involved on the TA, due to the workers of the port having been transferred from CDN to Portos do Norte.

Portos de Norte confirmed to the meeting their commitment to implement the with the existing Steps Plan for Nacala port Operations and Traing Programs, to follow the established KPIs and

informed that the harmonization was finished with CD, MTC and CFM (**attached III, doc 1,2,3**).

JICA TAT made a presentation of the Progress Report2 on the TA (**attached IV**) and after that where made the considerations and recommendations:

Considerations

The meeting noted with that :

1. The changes on the management of the Port from CDN to Portos do Norte did not affect the progress of the implementation of the Nacala Port Development Project.
2. That there is a strong commitment and support of Portos do Norte to the Project.
3. The Port is already congested before the new expected shipping line start to call Nacala
4. The need of standardization of the equipment to be acquired for the port within Portos do Norte and the Consultant could contribute for a better training plan on the maintenance. In the other hand it was noted that the 2 Reach Starker supported by Grant Aide should be available to the port before the end of the year 2013.

Recommendations

1. The Traing Programs need to be focus on the specific needs of the CFM Portos do Norte and CDN. Therefore the Consultant will receive from those institution the appropriate list of trainee in Mozambique and Japan.
2. Portos do Norte as part of the project will assign before end of April their counterpart to the TA project.
3. JICA TAT in the next step will help the Mozambican side to produce the draft Port Regulations and will help the PMU to prepare the Working Document binding the Contractor, Portos do Norte, CFM, CDN and the PMU during the construction phase.
4. Portos do Norte should avail their organization chart to the TAT

The meeting ended at 18hrs.20 with notes from the representatives of participants

Ministério dos Transportes e Comunicações
Dra. Ana Matusse Dimande_____
(Project Coordenator)

Empresa Corredor de Desenvolvimento do Norte
Eng. Adeval Acioli_____
(Port Operatios)

Empresa Portos e Caminhos-de-ferro
Dr Paulo Tarmamade_____
(Advisor to the Board)

Portos do Norte
Fernando Amado Couto
Chief Executive Oficer_____

JICA Technical Assistance Team
Mitsuhiko Okada
Team Leader 岡田光彦_____

(Attachment C)

Schedule for Technical Transfer in April, 2013

Area	Subject	April 12	April 13	April 15	Expert
Cargo Handling	IT system for CT Operation	9:30-11:00	10:00-11:00		Kimura
Maintenance for cargo handling equipment	Preventive Maintenance	Review of Dec'12 session	-		Kimura
	Maintenance Management	Review of Dec'12 session	-	-	Kimura
	Spare Parts Inventory	Review of Dec'12 session	-	10:00-16:00 (Field training with mechanical engineer and store keeper in charge)	Kimura
Maintenance for port facilities	Preventive Maintenance	11:00-12:00	9:00-10:00	11:00-12:30 (Field training with civil engineer in charge)	Kawabata
	Maintenance Management				Kawabata
Port planning	Port Planning system	14:00-15:00	11:00-12:00	-	Okada
	Demand Forecast	-	-	14:00-15:00	Okada
Port administration and management	Laws and Regulations	15:00-16:00	-	-	Nakashima
	Marketing of the port	-	-	15:00-16:00	Nakashima

Lecture

Field Study

(Attachment D)

Issues on the South Wharf of Nacala port

2013 April 17th
JICA TA team

1. F/S report's recommendation and conclusion on the South Wharf
(Page 4-22 ～ Page 4-25)

① (Recommendation of F/S report)
Measures for extending residual life for South Wharf
i) Installation of fenders (DONE)
ii) Minimization of surcharge loads (NOT done)
✓Clearance of loaded containers from the deck as stated above
iii) Measures for the alleviation of excessive forces by infrastructure management (NOT done)
✓Control of approaching velocity of ships to be less than 10cm/sec
✓Prohibition of mooring ships in a cyclone

iv)Monitoring of the structure (NOT done)
✓Regular monitoring of cracks on piles and front/rear walls once in three months
✓Regular monitoring of openings between the concrete deck and container yard
✓Regular measurement of compression strength of the structural members with a rebound hammer

② (Conclusion of F/S report)
Even when the renovation of rear wall and anchor wall is successfully completed, the vulnerability of the structure will remain unchanged because it is impossible to recover bending resistance of damaged piles head. Therefore, the realistic method of overall repair of the structure would be to demolish the entire structure and to construct a new structure.

2. Issues on South Wharf (as of 2013 April)

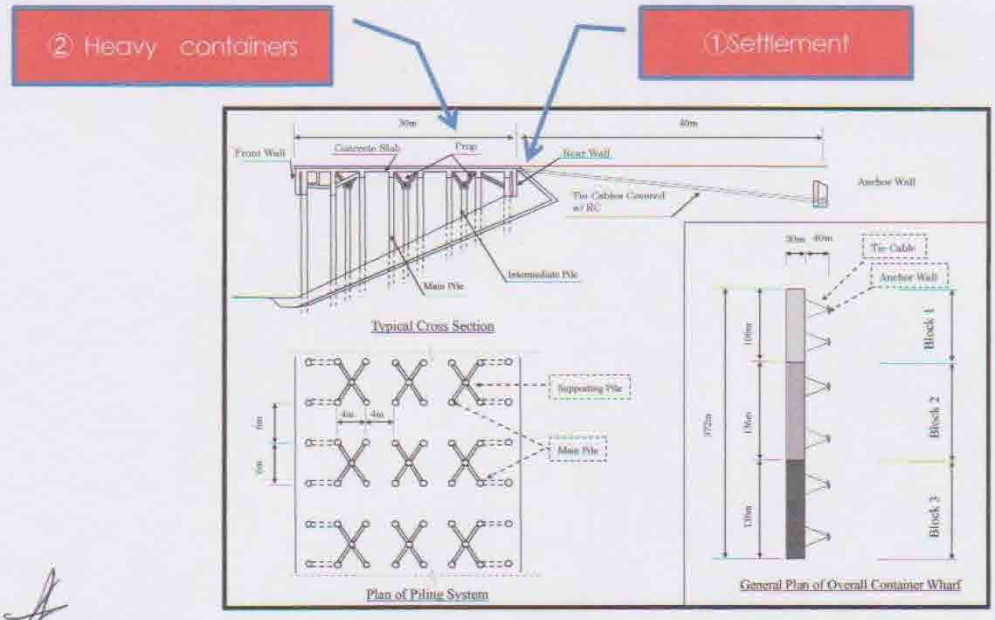
①The Pavement behind the rear wall has settled more than 9 cm from the original level. This settlement was not noticeable in 2010 during F/S stage.

②Laden Heavy containers are stacked on the deck of the South Wharf.

as observed in the photos below

Photo-① Settlement behind the rear wall (2013 April)

Photo-② Laden containers stacked on the deck of South Wharf (2013 April)



April 2013

3. Recommendations of JICA TA team

①As recommended in F/S report (page 4-24), monitoring of the deck structure and settlement shall be implemented on a regular basis according to the maintenance action plan.

②As recommended in F/S report (page 4-23), clear all the laden containers from the deck and minimize the active loads for handling containers by heavy equipment.

4. 第 6 次派遣 (2013 年 6 月)

Progress
of
The Project for Improvement of Nacala Port
in Republic of Mozambique

The JICA expert team for the Project (hereinafter referred to as "the Project Team")visited Mozambique fromJune11 to June29, 2013 as its 6th dispatch.

1. Training program for 6th dispatch

On June 14,The Project Team presented the program of technical assistancefor the Team's 6th dispatch to the Mozambican side in a meeting attended by representatives of MTC, CFM, CDN, and PN(the attendant list is as per Attachment B, and the program as per Attachment C). According to the program, the Project Team organized 13 sessions of discussions and lectures at Nacala for Mozambican counterparts including participants from CFM South and Central.The Project Team also carried out site inspections and interviews with counterparts.

2. Discussions in Nacala

Following issues have been discussed in Nacala between the Mozambican side and the Project Teamon June 14 and 18, 2013 (the attendant lists areas per Attachment B):

1) Facility maintenance:

Being the entity responsible for the regular inspection of the facilities as per the Concession Contract, CFM nominated 3 civil engineers who would hereafter become a part of the counterpart.

2) South Wharf issues:

The Project Team revised its previous report "Issues on the South Wharf of Nacala Port" based on the discussion above and findings through the site inspection on June 19 (the revised report is as per Attachment A).

The Project Team agreed to give a technical assistance for those measures taken by Mozambican side as a part of its scope of work for facility maintenance.

3) Safety regulation:

Following to the suggestion of the Project Team duringits last dispatch, the Mozambican side elaborated and presented its draft of the Safety Regulation of Nacala Port to the Project Team. The Project Team agreed to feed back its comments by the end of July, so that the Mozambican side can complete the draft for approval.

4) Phaeros system

PN explained that it would have discussions with IT technicians and Phaeros' agent from mid-July to September to identify the functions supported by the system and evaluate cost-effectiveness of the system, then it would make decision to use the system or not.

3. Assistance of the Project Team to PN's own training program

In addition to 1.and 2. above, the Project Team gave an assistance to the training program organized by PN's own on June 17, 2013.The Project Team highly appreciated this voluntary program organized by Mozambican side's initiative.

4. Training programs in July, September and November, 2013

1) Study program in Japan in July, 2013

The Mozambican side agreed to the detailed study program for 4 key counterparts in

Japan in July, 2013 including the receptions.

2) Training program in Japan in September, 2013

The Project Team explained that the tentative schedule for training program for 10mid-level counterparts is considered from August 30 to September 15, 2013.

3) The next dispatch of the Project Team

The Project Team explained that its next dispatch is considered tentatively from October 27 to November 15, 2013.

Maputo, June 27, 2013

Kiyoshi Nakashima
The Project Team
The Project for Improvement of
Nacala Port in Republic of Mozambique

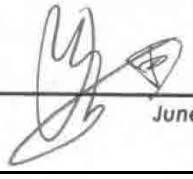
Dr. Ana MatusseDimande
Project Coordinator,
Nacala Port Development Project
Ministry of Transport & Communications

Meeting Records
of
The Project for Improvement of Nacala Port
in Republic of Mozambique

The JICA expert team for the Project (hereinafter referred to as "the Project Team") visited Nacala from June 13 to 27, 2013 as its 6th dispatch. The Project Team organized 14 sessions of discussions and lectures for the technical transfer including the assistance to PN's own training program on June 17, 2013 (the program as per the attachment). The Project Team also carried out site inspections and interviews with PN staffs.

In the wrap-up meeting on June 24, 2013, PN and the Project Team confirmed on the progress of technical transfer in line with the items of suggestion made by the Project Team on September 13, 2012 as follows:

1. Strengthening of marketing functions
   - PN will establish its own web site in August, 2013, which will contribute a lot to the strengthening of its marketing functions.
   - PN will soon assign the personnel in charge of marketing in its Commercial Dept.
   - The CEO of PN has made a sales call at CMA CGM's head quarter in France. PN is planning to visit other existing and potential users time to time.
2. Enforcement of the Regulation of Nacala Port
   - This issue shall be under the primal responsibility of CDN.
3. Achievement of higher container productivity using attachment with flippers and ropes.
   - PN will order TN to use ropes for the loading/discharge of containers, and request TN in writing to purchase the spreaders with flippers.
4. Renaming and striping of the container yard
   - This has not been realized yet due to PN's limited budget, while PN will soon carry out the marking of traffic signs in the container yard.
5. Addition of reach stackers
   - In addition to 3 units of the reach stackers (No. 5, 6, 7) that were available at the time of September, 2012, 1 unit (No. 8) newly joined in operation in May, 2013, and 1 unit (SMV 5) is now under repair. In August or September, 2 units of Sany are supposed to join in operation. Furthermore, 2 units will be given by the Grand Aid. Number of top lifters has remain unchanged as 3 units (No.1 & 2 for laden, No.4 for empty).
6. Employment of civil engineers for infrastructure maintenance
   - PN has contracted a Portuguese private company "Geoibéricos" to conduct a survey and make a plan of regular inspections and repairs under the supervision of CFM. The contract period will be 90 days commencing from the end of June, 2013.



June 2013

1

- CFM has assigned 3 civil engineers (Ms. Anabela Matsinha, Ms. Camona Mocobora and Mr. Crisiano Oliveira) who will supervise the above, and carry out periodical inspections of the port facilities.
- 2 staffs of PN (Mr. Neimo Induna, Container Yard Manager & Mr. Matos Fernandes, Adviser) will be involved in the facility maintenance time to time, as both have a background in civil engineering.

7. Monthly maintenance of civil infrastructure
   - The plan for periodical inspections and maintenance will be established in reference to the advice to be given by Geoibéricos as per the contract.
8. Establishment of a maintenance management plan for cargo handling equipment
   - PN has contracted Aitken Spence to establish maintenance management plan. The contract period is 2 years commencing from May, 2013, in which 4 technicians of Aitken Spence will be assigned.
9. The latest monitoring indicators related to cargo handling and maintenance (April/May 2013) were as follows:
   - Net crane/gang productivity: 7 boxes/vessel/hour
   - Working time ratio of equipment: 65 %

Training programs in July, September and November, 2013 are expected as follows:

- Japan study program for 4 key counterparts (fixed) from July 6 (leave Maputo) to July 22 (arrive at Nacala), 2013.
- Japan training program for mid-level counterparts (temporary) from August 31 (leave Maputo) to September 15 (arrive at Maputo), 2013.
- The next dispatch of the Project Team (temporary) from October 28 (arrive at Maputo) to November 15 (leave Maputo), 2013.

Nacala, June 26, 2013

Kiyoshi Nakashima
The Project Team
The Project for Improvement of
Nacala Port in Republic of Mozambique

Mr. Agostinho F. Langa Júnior
Comissão Executiva
Director de Operações
Portos do Norte, SA

(Attachment)

Technical Assistance Program in Nacala Port in June 2013

Day		Time	Session No.	Category	Lecturer	Title	Type
14-Jun	Fri	9:00-10:30	1	General	All TA Team	Kick-off meeting with CP	Discussion
		10:30-12:00	2	General	All TA Team	Discussion for PN's training on 17th	Discussion
17-Jun	Mon	7:00-18:00			All TA Team	Assistance to PN's training program	
18-Jun	Tue	9:00-10:30	3	Port Administration & Management	Capt. Etoh	Discussion on the terminal operation system (Phaeros)	Discussion
		10:30-12:00	4	Facility & Equipment Maintenance	Mr. Komoto	Discussion on structure integrity of South Wharf	Discussion
		15:00-16:30	5	Port Planning	Dr. Kunita	Grain terminal planning	Lecture
19-Jun	Wed	9:00-10:30	6	Port Administration & Management	Mr. Nakashima	Discussion on the Safety Regulation of Nacala Port	Discussion
		10:30-12:00	7	Port Planning	Dr. Kunita	Discussion on the safety during construction works	Lecture
		15:00-16:30		All		Site inspections & on-site suggestions	
20-Jun	Thu	9:00-10:30	8	Facility & Equipment Maintenance	Mr. Komoto	Discussion on the progress of the facility maintenance action plan	Discussion
		10:30-12:00	9	Port Administration & Management	Capt. Etoh	Lecture on container terminal operations	Lecture
		15:00-16:30	10	Port Administration & Management	Mr. Nakashima	Lecture on the regulation of port operations	Lecture
21-Jun	Fri	9:00-10:30	11	Port Administration & Management	Capt. Etoh	Discussion on the use of flippers	Discussion
		10:30-12:00	12	Port Administration & Management	Mr. Nakashima	Lecture on the regulation of port operations	Lecture
		15:00-16:30				Site inspections, on-site suggestions & interviews	
24-Jun	Mon	9:00-12:00	13	General	All TA Team	Wrap-up meeting, review of the progress of 10 suggestions	Discussion
		14:00-15:30	14	Facility & Equipment Maintenance	Mr. Komoto	Monitoring of civil infrastructures	Lecture
26-Jun	Wed	9:00-17:00				Site inspections, on-site suggestions & interviews	

(Attachment A)

Issues on the South Wharf of Nacala Port

2013 April 17th
Updated on 2013 June 14th and 18th
JICA TA team

1. F/S reports' recommended measures and conclusions on the South Wharf (Page 4-22 ～ Page 4-25)

① (Recommendation of F/S reports)
Measures for extending residual life for South Wharf

i) Installation of fenders (DONE)

ii) Minimization of surcharge loads (NOT done)

➔ PN explained that they have set limits to the stacking of containers at maximum of 2 rows x 3 layers of laden 40' on the land side edge of concrete deck at Block 3, and maximum of 1 row x 3 layers of laden 40' on the land side edge of concrete deck at Block 2. The Project Team appreciated their actions but explained that it would be difficult to identify the exact loads allowed on the deck since there is no design data or drawing available.

iii) Measures for the alleviation of excessive forces by infrastructure management (NOT done)

✓Control of approaching velocity of ships to be less than 10cm/sec

➔ It will be included in the "Safety Regulation of Nacala Port".

✓Clearance of loaded containers from the deck as stated above

➔ As above

✓Prohibition of mooring ships in a cyclone

➔ It will be included in the port regulation but it must be a common sense known by everybody working in the port.

iv) Monitoring of the structure (NOT done)

✓Regular monitoring of cracks on piles and front/rear walls once in three months

➔ It will be discussed in an additional session scheduled on June 24 PM.

✓Regular monitoring of openings between the concrete deck and container yard

➔ As above

✓Regular measurement of compression strength of the structural members with a rebound hammer

➔ As above

② (Conclusion of F/S reports)
Even when the renovation of rear wall and anchor wall is successfully completed, the vulnerability of the structure will remain unchanged because it is impossible to recover bending resistance of damaged piles head. Therefore, the realistic method of overall repair of the structure would be to demolish the entire structure and to construct a new structure.

➔ C/P has an intention to somehow find a way to prolong its life not by demolition but through partial repairs.

2. Issues on South Wharf (as of 2013 April)

①The Pavement behind the rear wall has settled more than 9 cm from the original level. This settlement was not noticeable in 2010 during F/S stage.

➔ PN has contracted with a private company to conduct a survey and make a plan of regular inspections and repairs under the supervision of CFM. The

Project Team suggested that an investigation needs to be done by this company to identify the reason of the settlement and establish further countermeasures.

➔ The Project Team suggested that the laden containers placed just behind the deck slab shall also be relocated to reduce unnecessary load on the concrete/interlocking block pavement where further settlement or collapsing may take place due to underground voids.

②Laden Heavy containers are stacked on the deck of the South Wharf.

➔ See 1 ① ii)

as observed in the photos below

Photo-① Settlement behind the rear wall (2013 April)

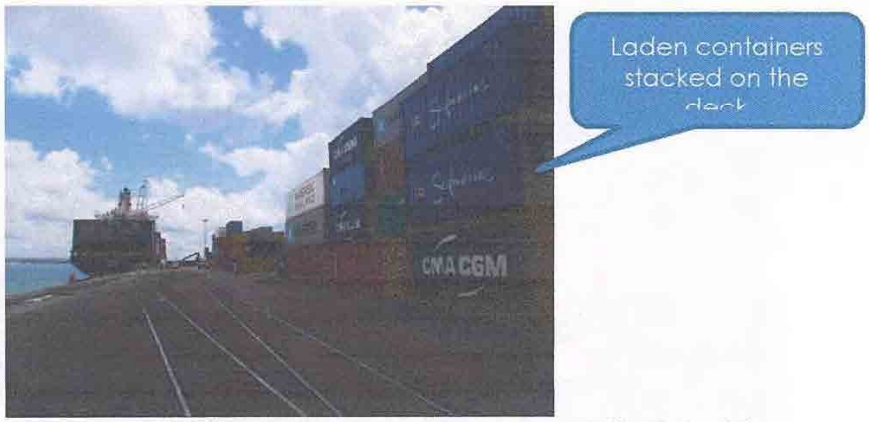
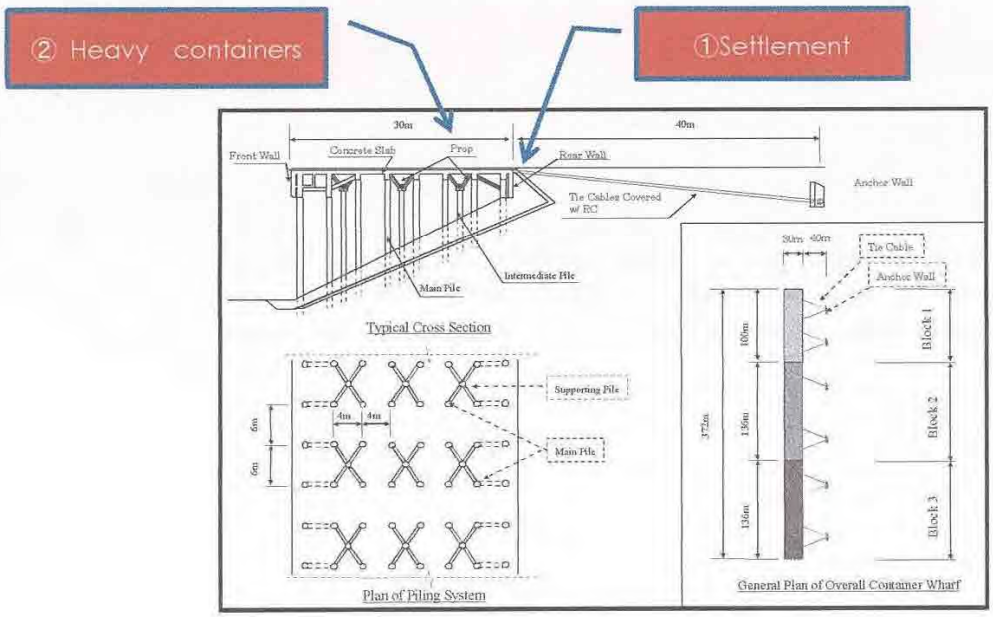


Photo-② Laden containers stacked on the deck of South Wharf (2013 April)



3. Recommendations of JICA TA team

① As recommended in F/S report (page 4-24), monitoring of settlement shall be implemented.

➔ It will be discussed in an additional session scheduled on June 24.

②As recommended in F/S report (page 4-23), clear all the laden containers from the deck and to minimize the active loads for handling containers by heavy equipment.

➔ See 1 ① ii)
➔ C/P has limited their container operation on the deck to 1 laden container at a time.

Photos taken on June 17

Number of containers on the deck has been limited to 2 rows x 3 layers at Block 3

Number of laden containers on the deck has been limited to 1 row x 3 layers at Block 2
Laden containers just behind the deck are recommended to be relocated to reduce unnecessary load onto the pavement.

(Attachment B)

Attendance List for the Training Sessions provided by the JICA expert team (June 2013)

Theme	Kick-off meeting with O/Ps	Session No.	01
Date & Time	9:00-10:30, June 14, 2013		
Participants	All JICA team with O/Ps		
Venue	PN Conference Room		

No	Name	Title / Section	Org.	Signature
1	Ana Matusse Domingos	Project Coordinator	MTC	
2	Anastácio [illegible]anga Jr	Chief Operational Officer	PN	
3	Kyuzo NAKASHIMA	JICA Expert	JICA	
4	Osamu KUNITA	JICA Expert		
5	Tomoki [illegible]	JICA Expert		
6	Masaomi KOMOTO	JICA Expert		
7	Nobuaki KURIBAYASHI	JICA Mozambique		
8	[illegible]	[illegible]	[illegible]	
9	[illegible]	[illegible]	[illegible]	
10	[illegible]	[illegible]	[illegible]	
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

The Project for the Improvement of the Nacala Port

Attendance List for the Training Sessions provided by the JICA expert team (June 2013)

Category/Area of Training	Facility & Equipment Maintenance	Session No.	01
Title	Discussion on structure integrity of South Wharf		
Date & Time	10:30 12:00, June 18 2013		
Lecturer	Mr Komoto, JICA Expert		
Venue	PN Conference Room		

No.	Name	Title / Section	Org.	Signature
1	Ana Matusse Dimande	Project Coordinator	VTC	
2	Anabela Matsinha	Civil Engineer	CFM	
3	Aquilo Agy Ibrahimo	Mechanical Engineer		
4	Arsenio Zimba	Hydraulic Engineer		
5	Atanasio Neves	Mechanical Engineer		
6	Cristino de Oliveira	Civil Engineer		
7	Miguel Jamisse	Mechanical Engineer		
8	Agostinho F. Langa Jr	Operation Director/Executive Committee	PN	
9	Afonso Vasco da Cunha J	Chief of the Maintenance Division		
10	Nelma Inroma	Container Yard Manager		
11	Sérgio Simão	Nacala Port Manager	CFM	
12	[illegible]	CFM - Representative - [illegible]	[illegible]	
13	[illegible]	[illegible]	[illegible]	
14	[illegible]	[illegible]	[illegible]	
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				

The Project for the Improvement of the Nacala Port

June 2013

9

(Attachment C)

Day		Time	Session No.	Category	Lecturer	Title
14-Jun	Fri	9:00-10:30	1	General	All TA Team	Kick-off meeting with CP
		10:30-12:00	2	General	All TA Team	Discussion for CP's training on 17th
17-Jun	Mon	9:00-17:00			All TA Team	Reserved for CP's training
18-Jun	Tue	9:00-10:30	3	Port Administration & Management	Capt. Etoh	Discussion on the terminal operation system (Phaeros)
		10:30-12:00	4	Facility & Equipment Maintenance	Mr. Komoto	Discussion on structure integrity of South Wharf
		15:00-16:30	5	Port Planning	Dr. Kunita	Bulk terminal planning
19-Jun	Wed	9:00-10:30	6	Port Administration & Management	Mr. Nakashima	Discussion on the safety policy of Nacala Port
		10:30-12:00	7	Port Planning	Dr. Kunita	Discussion on the safety during construction works
		15:00-16:30		All		Site inspections & on-site suggestions
20-Jun	Thu	9:00-10:30	8	Facility & Equipment Maintenance	Mr. Komoto	Discussion on the progress of the facility maintenance action plan
		10:30-12:00	9	Port Administration & Management	Capt. Etoh	Lecture on container terminal operations
		15:00-16:30	10	Port Administration & Management	Mr. Nakashima	Lecture on the regulation of port operations
21-Jun	Fri	9:00-10:30	11	Port Administration & Management	Capt. Etoh	Discussion on the use of flippers
		10:30-12:00	12	Port Administration & Management	Mr. Nakashima	Lecture on the regulation of port operations
		15:00-16:30				Site inspections & on-site suggestions
24-Jun	Mon	9:00-12:00	13	General	All TA Team	Wrap-up meeting, review of the progress of 10 suggestions
		13:00-16:30				Spare (depending on the progress of discussions/lectures)
26-Jun	Wed	9:00-17:00				Spare (depending on the progress of discussions/lectures)

5. 第 3 回 JCC (第 7 次派遣, 2013 年 12 月)

Conclusion
of
The Third Joint Coordination Committee
for
The Project for Improvement of Nacala Port
in Republic of Mozambique

The third meeting of the Joint Coordination Committee (hereinafter referred to as "JCC") for the Project for Improvement of Nacala Port in Republic of Mozambique (hereinafter referred to as "the Project") was held on December 19, 2013 at the MTC office in Maputo. The attendants are listed in Attachment A.

At the meeting of JCC, the JICA expert team for the Project (hereinafter referred to as "the Project Team") presented the progress of the Project since April, 2013 (Attachment B) and steps to be taken to make Nacala Port more efficient identified during its 7th dispatch (Attachment C).

The Project Team commended significant progress achieved in such areas as the preparation of maintenance plan, implementation of on-site infrastructure monitoring, improvement in equipment availability ratio, and upgrading of the Phaeros system. The Project Team emphasized that further efforts would be needed to improve Nacala Port in such areas as: increase in container handling efficiency, effective use of the dry terminal, start of the periodical infrastructure maintenance, and determination of reinforcement of the structures of the South Wharf.

JCC appreciated the progress of the Project and concurred on the need of further efforts aimed to the improvement of Nacala Port. Toward this goal, the Mozambican side and the Project Team will jointly monitor the improvement of Nacala Port and pursue technology transfer. The next visit of the Project Team is expected in April 2014.

Maputo, December 19, 2013

Mitsuhiko Okada	Dr. Ana Matusse Dimande
JICA Team Leader	Coordinator,
The Project for Improvement of	Nacala Port Development Project
Nacala Port in Republic of Mozambique	Ministry of Transport & Communications

(Attachment A)

Participants of the 3rd Joint Coordination Committee (Maputo, December 19, 2013)

Name	Organization	Position
(Mozambican side)		
Dr. Ana Matusse Dimande	MTC	Coordinator
Mr. Paulo Tarmamade	CFM	Advisor to the Board of Directors
Mr. Amado Mabasso	CDN	CEO
Mr. Pedro Barreto	CDN	CFO
Ms. Leonilde Loide Bazar	PN	Director of Administration & Human Resources
(Japanese side)		
Mr. Katsuyoshi Sudo	JICA Mozambique office	Resident Representative
Ms. Chiharu Morita	JICA Mozambique office	Assistant Resident Representative
Mr. Mitsuhiko Okada	JICA Expert	Team Leader / Port Planning (1)
Mr. Masaomi Komoto	JICA Expert	Facility & Equipment Maintenance / Training Coordination
Mr. Teruki Eto	JICA Expert	Port administration and management (2)
Mr. Susumu Kimura	JICA Expert	Port cargo handling (2)
Mr. Nobuaki Kuribayashi	JICA Expert	Liaison officer

Attachment B

Third Progress Report

The Project for Improvement of Nacala Port

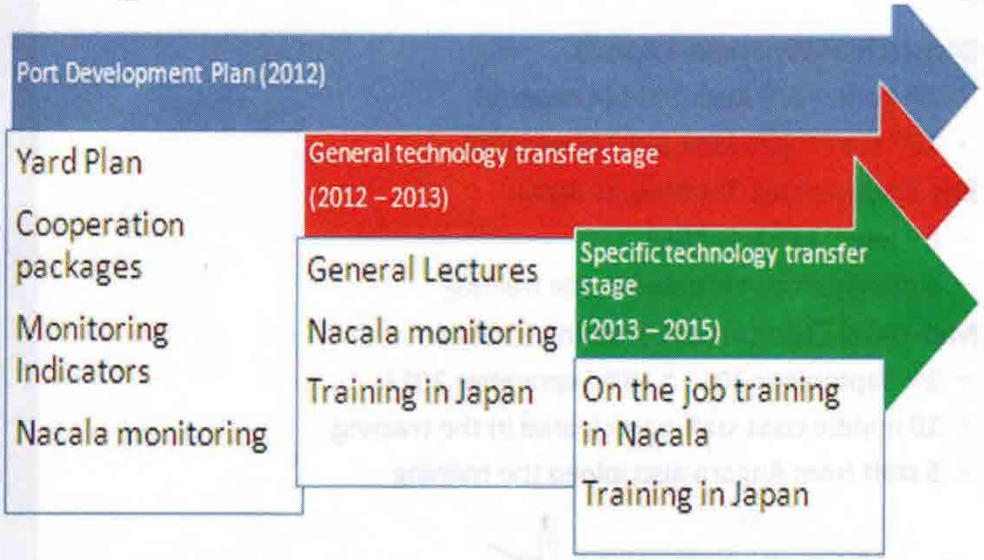
November 2013

Japan International Cooperation Agency (JICA)

The Overseas Coastal Area Development Institute of Japan (OCDI)

1

Concept of Technology Transfer Program



Concept of Technology Transfer

2

Attachment (C)

Steps to be taken to make Nacala Port more efficient

2013-12-19

	Steps	Timeline	
		January	before April 2014
Mozambican side	◦Start of infrastructure monitoring and maintenance based on the Geoibericos report and employment of a civil engineer (PN, CDN, CFM)	✓	
	◦Review of the JICA Team's comments on Phaeros upgrading and start of the Phaeros system (PN)		✓
	◦Review of the JICA Team's comments on the safety regulations (CDN)	✓	
	◦Monitoring of the container handling productivity based on 3 indicators (PN)	✓	
	◦Determination of the pavement design of the dry terminal (TN, PN)		✓
	◦Review of the rehabilitation measures for the South Wharf indicated in the Geoibericos report (CDN, CFM)		✓
	◦Procurement of spreaders with flippers (TN)		✓
JICA Team	◦Review of rehabilitation measures for the South Wharf indicated in the Geoibericos report	✓	
	◦Review of the infrastructure maintenance plan proposed in the Geoibericos report	✓	
	◦Preparation of lecture materials on "5S"		✓
	◦Preparation of lecture materials on environmental management		✓
	◦Start of the procurement process for survey equipment (preparation of an equipment list needed for quantitative monitoring)		✓

6. 第 8 次派遣 (2014 年 4 月)

Progress
of
The Project for Improvement of Nacala Port
in the Republic of Mozambique

The JICA expert team for the Project (hereinafter referred to as "the Project Team") visited Mozambique from April 16 to May 3, 2014. After a series of discussions, presentations, and site monitoring, the Project Team and Mozambican counterparts had a wrap-up meeting on April 28 (the attendance list of the meeting is as attached (Attachment A)). In the meeting, the Project Team summarized the outcome of the 8th dispatch (Attachment B). Both sides then examined and acknowledged the progress of the Project in reference to the Project Design Matrix (Attachment C) and agreed on the following main points:

1. With respect to port planning, the Project accomplished the target resulting in the start of ODA projects. In response to the changing needs of port and hinterland, a new port master plan needs to be formulated outside the scope of the Project.
2. With respect to port administration/management, significant progress has been made resulting in drafting of safety and operation regulations. These regulations need to be finalized and implemented as soon as possible. In order to clearly define the responsibility of the pertinent organizations, the revision of the concession agreement needs to be finalized.
3. With respect to cargo handling, significant progress has been made in such areas as upgrades of the Phaeros (container terminal operation system), strengthening of the dry terminal functions, and procurement of new spreaders. Their steady progress and implementation need to be monitored. Since the Phaeros does not include automatic yard planning functions, yard planners need to be trained either by overseas training or onsite OJT for a considerable amount of time. Monitoring of container handling productivity by three universally applied indicators (berth productivity, gross productivity per crane, and net productivity per crane) is also recommended.
4. With respect to maintenance, some progress has been made in such areas as the assignment of civil engineers of CFM and PN for infrastructure maintenance and decrease in the equipment downtime. On the other hand, periodical inspection/monitoring of infrastructure are not yet started. The Project Team will provide technical assistance for this area by means of onsite training during the next dispatch. Further study and policy decision on the rehabilitation of the South Wharf are needed in consideration of the Project Team's suggestions. Delivery of spare parts needs to be expedited to further reduce the equipment downtime.

The Project Team and Mozambican counterparts confirmed the latest monitoring indicators related to cargo handling and maintenance as follows:

1. Gross productivity: 8 Box/gang/hour (December 2013)
2. Working time ratio of equipment: 85 % (March 2014)

The next visit of the Project Team is expected in September 2014.

Nacala, April 28, 2014

April 2014

Mitsuhiko Okada
JICA Team Leader
The Project for Improvement of
Nacala Port in Republic of Mozambique

Agostinho F. Langa Junior
Operation Director
Portos do Norte, SA

Attendance List for the Training Sessions provided by the JICA Expert Team (April 2014)

Category/Area of Training	General	Session No.	11
Title	# Wrap-up Meeting		
Date & Time	09:30-11:30, April 28, 2014		
Lecturer	Mr. Okada(JICA)		
Venue	PN Conference Room		

No.	Name	Title / Section	Org.	Signature
1	Ana Matusse Dimande	Project Coordinator	MTC	
2	Anabela Matsinha	Civil Engineer	CFM	
3	Alfredo Lipeque	Branch Manager	CFM (North)	
4	Alfredo Sigola	Maintenance Manager		
5	Abubacar Mecuta	Inspection Manager		
6	Alfredo Mafuca	Operations Manager		
7	Braulio Catutula	I.T. Manager		
8	Agostinho F. Langa Junior	Chief Operating Officer	PN	
9	Loni Shott	Chief of the Commercial Division		28.4.14
10	Luis Machado	Chief of the Port Operation Division		
11	Lucas José Cipriano	Project Management Unit		
12	Vasco da Cunha	Maintenance Division		
13	Luis Alvito Diogo	Maintenance Division		
14	Abudo Sele	Project Management Unit		
15	Mitsuhiko Okada	JICA Expert	JICA	
16	Kiyoshi Nakashima			
17	Susumu Kimura			
18	Masaomi Komoto			
19	Nobuaki Kuribayashi	JICA Mozambique		
20	Ibraimo Musa	CDN – Port Authority	CDN	
21	ANTONIO F. CÂNDIDO	CDN	CDN	
22				
23				
24				
25				

April 2014

3

Outcome of the 8th dispatch
– Steps to be taken to make Nacala Port more efficient

JICA Technical Assistance Team
April 2014

1

Session 1 (Morning, Apr. 21)
Technical assistance plan of 8th dispatch

- Both sides agreed on the time table of the 8th dispatch presented by JICA Team
- JICA Team presented a tentative plan of the this year's counterpart training in Japan and asked for the designation of participants

2

Progress of the Project based on the PDM (Project Design Matrix)

April 28. 2014

Description of PDM		Progress and further actions		
Narrative summary of outputs	Objectively verifiable indicators	Outputs up to April 2014	Evaluation of the progress as of April 2014	Recommendable actions (Items in parenthesis are out of the scope of the current TA project)
Port development strategy is developed	Port development strategy is drafted	# Revised port development plan was prepared and agreed on among pertinent parties (September 2012)	Targets accomplished	# (Master plan beyond the short-term development) # (Rehabilitation plan of the South Wharf)
The implementation structure of the short-term development is revised and established	Short-term development plan is revised	# Grant aid project started (March 2014) # Loan-1 project is starting D/D		
The capacity of the port administration and management is developed	# Regulation on port administration and management is drafted # Port is administered and managed according to the regulation	# Operational regulation and safety regulation are drafted # Safety regulation was announced to stakeholders in a seminar (April 2014)	In progress	Operational regulation and safety regulation need to be finalized and implemented (soon)

Description of PDM		Progress and further actions		
Cargo handling skill is improved	# Cargo handling capacity per hour increases # Accident rate decreases # Number of seminar/training and participants who pass the training exam increases	# Cargo handling efficiency is gradually improving # Accidents are recorded and preventive measures are analyzed # 98 counterparts participated in 7 sessions of lecture/discussions on cargo handling # Phaeros (terminal operation system) is in a trial (April 2014) # Upgrades of the dry terminal was started (January 2014) # Purchase order for new spreaders was placed	In progress	# Container handling productivity needs to be monitored by 3 universally applied indicators (constantly) # (Yard planners need to be trained either by training overseas or onsite OJT (for a considerable amount of time))

Description of PDM		Progress and further actions		
Maintenance skills of the port facility and equipment is developed	# Number of maintenance technicians increases # Maintenance cost for existing facility and equipment decreases # Number of seminar/training and participants who pass the training exam increases	# Two civil engineers of CFM is assigned for infrastructure maintenance # A civil engineer of PN is assigned for infrastructure maintenance # Downtime ratio of equipment decreased (from 20 % to 15 %) # 86 counterparts participated in 11 sessions of lecture/discussions on infrastructure maintenance # Counterparts understood the survey and analysis needed to determine the measures to rehabilitate the South Wharf # 74 counterparts participated in 8 sessions of lecture/discussions on equipment maintenance # Periodical maintenance plan for equipment is developed and implemented	In progress	# Start of the periodical inspection/monitoring of infrastructure (immediately) # Preparation for the on-site infrastructure monitoring (before September 2014) # On-site infrastructure monitoring training using survey equipment (September 2014) # Further study and policy decision on the rehabilitation of the South Wharf considering the suggestions of JICA Team

7. 第 9 次派遣 (2014 年 9 月)

Progress
of
The Project for Improvement of Nacala Port
in the Republic of Mozambique

The JICA expert team for the Project (hereinafter referred to as "the Project Team") visited Mozambique from August 31 to September 19, 2014. After a series of discussions, presentations, and site monitoring, the Project Team and Mozambican counterparts had a wrap-up meeting on September 15 (the attendance list of the meeting is as attached (Attachment A)). In the meeting, the Project Team summarized the outcome of the 9th dispatch (Attachment B). Both sides then examined and acknowledged the progress of the Project in reference to the Project Design Matrix (Attachment C) and signed a record of discussions (Attachment D).

The Project Team and Mozambican side had a wrap-up meeting in Maputo on September 18 (the attendance list of the meeting is as attached (Attachment E)). In this meeting, both sides had additional discussions and revised the common understanding as follows:

1. With respect to port planning, the Project accomplished the target resulting in the start of ODA projects. In response to the changing needs of port and hinterland, a Nacala Port land use plan covering the Nacala Bay needs to be formulated outside the scope of the Project. A new port master plan (a draft TOR is attached as Attachment F) would be a part of the land use plan. The Mozambican side will submit its request for the land use plan study to JICA.

2. With respect to port administration/management, significant progress has been made resulting in the implementation of the safety regulation and drafting of the operational regulation. The latter needs to be finalized and implemented as soon as possible. In order to clearly define the responsibility of the pertinent organizations, the revision of the concession agreement needs to be finalized.

3. With respect to cargo handling, significant progress has been made in such areas as upgrades of the Phaeros (container terminal operation system), strengthening of the dry terminal functions, and procurement of new spreaders. Their steady progress and implementation need to be monitored. Since the Phaeros does not include automatic yard planning functions, yard planners need to be trained by overseas training and onsite OJT for a considerable amount of time. Monitoring of container handling productivity by three universally applied indicators (berth productivity, gross productivity per crane, and net productivity per crane) is also recommended.

4. With respect to maintenance, significant progress has been made in such areas as the assignment of civil engineers of CFM and PN for infrastructure maintenance, start of periodical inspection/monitoring of infrastructure and decrease in the equipment downtime. Mozambican civil engineers need to be trained by overseas training and onsite OJT. The Mozambican side needs to clarify the responsible party and the preparation for the maintenance of equipment introduced in ODA projects. On the other hand, a policy decision on the rehabilitation of the South Wharf is needed in consideration of the Project Team's suggestions. A seminar on the South Wharf (which could be developed as Phase 3) and the North Wharf can be held in Japan in November 2014 (The Mozambican side will soon propose the date).

September 2014

5. With respect to safety, additional attention should be paid during the rehabilitation projects. Lessons learned from accidents need to be circulated to all employees.

6. With respect to the arrangement of the last dispatch, the Mozambican side requested a two-week delay from the proposed schedule due to the difficulty in allocating the new fiscal year budget. In this case, the last dispatch will start around January 23.

7. With respect to the need of the future technical assistance, a preliminary TOR (Attachment G) was prepared based on the requests from the Mozambican side.

Maputo, September 18, 2014

Mitsuhiko Okada	Ana MM Dimande
JICA Team Leader	Project Coordinator,
The Project for Improvement of	Nacala Port Development Project,
Nacala Port in Republic of Mozambique	Ministry of Transport and Communications

Attachment A

Attendance List for the Training Sessions provided by the JICA Expert Team (September 2014)

Category/Area of Training	General	Session No.	13
Title	# Progress of the Project Based on PDM and Review of PN Statistics (CFM, CDN, PN, TN, JICA) # Wrap-up Meeting		
Date & Time	09:30 - 11:30, September 15, 2014		
Lecturer	-		
Venue	PN Meeting Room		

No.	Name	Title / Section	Org.	Signature
1	Martinho F. Mafumo	Maritime Administrator	MTC	[signature]
2	Edgar Jorge	Superviser Chief Engineer	CFM	
3	Anabela Matsinha	Supervisor Civil Engineer		[signature]
4	Alfredo Artur Mafuca	Oil Terminal Manager		
5	Alfredo Rafael Sigola	CFM Nacala Infrastructure Chief		
6	Braulio Franco Catutula	Port Operation		
7	Arzilio Mata	Supervisor Civil Engineer		[signature]
8	Milione Changala	Supervisor Electrical Engineer		[signature]
9	Abubacar Mecuta	Port security		
10	Tomas Ngoca	Supervisor Mechanical Engineer		
11	Goncalves Chizuzu	Port Operation		Chizuzu
12	Ibraimo Mussa	Port Operations Analyst	CDN	[signature]
13	Fabio Frasao	Port Director		
14	Antonio Frederico	Chief of Infrastructure Mainantance department		
15	Zacaria Andarusse	Safety Assistant Oficcer		
16	Francisco David	Safety Consultant Officer		
17	Loni Shott	Chief of the Commercial Division	PN	
18	Luis Machado	Chief of the Port Operations Division		[signature]
19	Lucas Cipriano	Project Management Unit (PMU)		[signature]
20	Denilson Hamide	Branch Manager	TN	
21	Sunil Ratnasiri	TN Officer		[signature]
22	Hélvio Salomão	TN Officer		
23	Mitsuhiko OKADA	JICA Expert/ Team Leader	JICA	[signature]
24	Teruki ETO	JICA Expert		Eto
25	Susumu KIMURA	JICA Expert		S. Kimura
26	Masaomi KOMOTO	JICA Expert		[signature]
27	Nobuaki KURIBAYASHI	JICA Mozambique		[signature]
28	Abudo Sele	Project Management Unit	PN	[signature]
29	Fleclerck	CFM	CFM	[signature]
30	Chaue	CFM	CFM	[signature]

The Project for the Improvement of the Nacala Port

Attachment B

OUTCOME OF THE 9TH DISPATCH
- STEPS TO BE TAKEN TO MAKE NACALA PORT MORE EFFICIENT

JICA Technical Assistance Team
September 2014

Session 1 (Morning, Sep. 4)
Technical assistance plan of the 9th dispatch

- Both sides agreed on the program of the 9th dispatch presented by JICA Team
- Mozambican counterparts were requested to participate and present the progress since the 8th dispatch in relevant sessions

Attachment C

Progress of the Project based on the PDM (Project Design Matrix)

September 15 2014

Description of PDM		Progress and further actions		
Narrative summary of outputs	Objectively verifiable indicators	Outputs up to September 2014	Evaluation of the progress as of September 2014	Recommendable actions (Items in parenthesis are out of the scope of the current TA project)
Port development strategy is developed	Port development strategy is drafted	# Revised port development plan was prepared and agreed on among pertinent parties (September 2012)	Targets accomplished	# (Master plan beyond the short-term development) # (Rehabilitation plan of the South Wharf)
The implementation structure of the short-term development is revised and established	Short-term development plan is revised	# Grant aid project started (March 2014) # Loan-1 project started D/D		
The capacity of the port administration and management is developed	# Regulation on port administration and management is drafted # Port is administered and managed according to the regulation	# Operational regulation and safety regulation are drafted # Safety regulation was announced to stakeholders in a seminar (April 2014) and approved by the CDN board (June 2014)	In progress	Operational regulation needs to be finalized and implemented (soon)

Description of PDM		Progress and further actions		
Cargo handling skill is improved	# Cargo handling capacity per hour increases # Accident rate decreases # Number of seminar/training and participants who pass the training exam increases	# Cargo handling efficiency is gradually improving # Accidents are recorded and preventive measures are analyzed # 114 counterparts participated in 9 sessions of lecture/discussions on cargo handling # Phaeros (terminal operation system) is in a trial participated by 2 shipping agents (September 2014) # Leveling of the dry terminal was completed (September 2014) # New spreaders arrived (September 2014)	In progress	# Use of Phaeros by all shipping agents (soon) # Review of the Phaeros system to decide whether it is useful for the entire container terminal operation # Use of new spreaders (soon) # Container handling productivity needs to be monitored by 3 universally applied indicators (constantly) # (Yard plannersand vessel planners need to be nominated and then trained either by training overseas or onsite OJT (for a considerable amount of time)) # Lessons learned from accidents should be circulated among all employees (immediately)

Description of PDM		Progress and further actions		
Maintenance skills of the port facility and equipment is developed	# Number of maintenance technicians increases # Maintenance cost for existing facility and equipment decreases # Number of seminar/training and participants who pass the training exam increases	# Three civil engineers (two from CFM and one from PN) is assigned for infrastructure maintenance # Counterparts received infrastructure monitoring training using survey equipment (September 2014) # Downtime ratio of equipment decreased (from 39 % in 2012 to 21 % in 2014) # 102 counterparts participated in 14 sessions of lecture/discussions on infrastructure maintenance # Counterparts understood the survey and analysis needed to determine the measures to rehabilitate the South Wharf # 94 counterparts participated in 10 sessions of lecture/discussions on equipment maintenance # Periodical maintenance plan for equipment is developed and implemented	In progress	# Periodical inspection/monitoring of infrastructure (constantly) # Further study and policy decision on the rehabilitation of the South Wharf considering the suggestions of JICA Team # Compilation of an spare parts inventory list (immediately) # Clarification of the responsible party and start of preparation for the maintenance of equipment introduced in ODA projects (soon) # Sharing the information on the conditions of each equipment (immediately)

Attachment E

REPÚBLICA DE MOÇAMBIQUE
MINISTÉRIO DOS TRANSPORTES E COMUNICAÇÕES
PROJECTO DE DESENVOLVIMENTO DO PORTO DE NACALA

TECHNICAL ASSISTANCE MISSION - PHASE II PDPN **18-09-2014**

Ord. Nr.	Name	Position	Institution	Contacts		Signature
				Email	Cell	
1	Ana dimande	Project Manager	INATTER/PDPN	anadimande@yahoo.com.br	825308568	
	Martinho Mafumo	ADMAR NACALA	INAMAR - Nampula	timpswalo@yahoo.com.br	849794983	
2	Anibal Manave	ASSESSOR	CFM	anibal.manave@cfm.co.mz	824346430	
3	Amado Mabasso		CDN	amado.mabasso@cdncear.com	823013863	
4	Agostinho Langa		Portos do Norte	paulobauque@ane.gov.mz	823229519	
5	Antonio Bulande	Jurista	INATTER	antoniobulande@yahoo.com.br	824691060	
6	Nitsuhiko Okada		JICA	m-okada@ocdi.or.jp	827076125	
7	Susumu Kimura		JICA	kimura@ocdi.or.jp	823707173	
8	Masaomi Komoto		JICA	komoto@ocdi.or.jp	820007877	
9	TERUKI ETO		JICA	eto@ocdi.or.jp	826449154	
10	FABIO TERRA DUARTE	EXECUTIVE COMMITTEE ADVISOR	CDN	FABIO.DUARTE@CDNCEARA.COM	823080967	
11	Rosa Machava	Assistant	MTC/PDPN	rosamachava@gmail.com	829168190	

Attachment F

(DRAFT)

Terms of Reference
for Master Plan Study of Nacala Port
in
the Republic of Mozambique

May 2014

1. Project Title

Master Plan Study of Nacala Port in the Republic of Mozambique

2. Executing Agency

Ministry of Transport and Communications

3. Proposed Source of Assistance

Japanese Government through the Japan International Cooperation Agency (JICA)

4. Background

JICA and the Ministry of Transport and Communications of Mozambique are implementing a grant aid project for the rehabilitation of Nacala Port, and preparing for a Yen Loan project for further development of the port. These projects will greatly contribute to the economic development of the country as Nacala Port is the cornerstone of northern Mozambique and will serve as a regional hub of maritime and land transportation.

Recently a huge gas field was found off the northern coast of Mozambique. This will have great impacts on port activities and industrial activities in northern Mozambique including Nacala. At the same time, ProSAVANA-JBM, a large-scale tripartite agricultural development project, is underway along the Nacala Corridor and poised to produce export products. Inland road and railway networks are being rapidly improved by both public and private sector. A large-scale coal export facility is about to start operation in Nacala-a-Velha. In 2013, CDN, the concessionaire of Nacala Port, subcontracted the port operation to a newly created entity, PN. These developments, though having significant impacts on port development and port administration, were not envisaged when the existing master plan was formulated with the assistance of JICA. Therefore, there is a strong justification for the formulation of a new comprehensive port master plan responding to the changing needs in and around Nacala Port.

5. Study Area

The Study shall cover Nacala Port and its hinterland including the Nacala Corridor.

6. Objectives of the Study

The objectives of the Study are:

1) To identify the potential of port development around Nacala in providing an efficient maritime transport system as well as sustaining industrial activities behind the port, taking into account future economic, industrial and trade policies of Mozambique.
2) To prepare a strategic concept for port development.
3) To prepare a comprehensive master plan for Nacala Port in the port's vicinity (Target year 2030).
4) To prepare an urgent development plan for prioritized projects including facility requirements and

implementation schemes (Target year 2020).

5) To give technical advice on the development and maintenance of the port.
6) To examine measures to minimize negative environmental impacts.
7) To make recommendations on the project implementation scheme including PPP
8) To make recommendations on efficient port administration including proper distribution of functions among pertinent agencies
9) To carry out technology transfer through the conduct of the Study.

7. Scope of the Study

To achieve the objectives mentioned above, the Study shall cover the following items:

7-1 Preparation of a strategic concept of port development

1) To set up a future socio-economic framework in the port's hinterland.
2) To assess the future demand for maritime transport and industrial activities in northern Mozambique paying due consideration to the evolving maritime network in East Africa. Implications of grain export originating inland, impacts of gas exploitation in northern Mozambique, and the growing potential of Nacala Port as a fuel import/distribution hub for the hinterland shall be duly considered as well.
3) To examine appropriate port and industrial functions to be provided by Nacala Port.
4) To prepare a strategic concept of port development in Nacala.

7-2 Preparation of a port development master plan (target year 2030)

1) To forecast the future maritime transportation demand.
2) To acquire data on natural conditions and environmental conditions around the development area.
3) To prepare a development master plan including physical port development/layout plans and industrial land-use plans.
4) To recommend technical measures to efficiently develop the port.
5) To recommend appropriate managerial/institutional settings for port administration and project implementation.
6) To make a rough cost estimate of the plans.

7-3 Preparation of an urgent development plan (target year 2020)

1) To prioritize the development projects proposed in the master plan.
2) To prepare an urgent development plan including development requirements of the selected projects, physical facility planning, and cost estimate.
3) To examine funding schemes for the priority projects including PPP.
4) To evaluate the urgent development plan from the economic, financial, institutional and environmental viewpoints.

7-4 Utilization of Japanese Cooperation Schemes

Applicability of Japanese ODA scheme options would be examined for the effective implementation of the urgent development plan.

7-5 Technology Transfer

During the study period, technology transfer to the counterparts shall be pursued. A series of seminars on various planning issues shall be held with the attendance of counterparts. Some of the counterpart personnel shall be invited to Japan to participate in relevant port training courses.

8. Tentative Schedule

The Study will be completed in approximately twelve (12) months after commencement and be carried out according to the study schedule attached below. The following reports in English /Portuguese shall be submitted to the relevant authorities.

#1 Inception Report
Detailed contents and schedule of the study work

#2 Progress Report
Strategic concept for port and industrial development

#3 Interim Report
Development master plan

#4 Draft Final Report
Provisional results of the Study

#5 Final Report
Final results of the Study prepared in consideration of the feedback from the Mozambique side to the Draft Final Report

Study Schedule (tentative)

	1	2	3	4	5	6	7	8	9	10	11	12
Work in Mozambique	←	→		←	→		←	→		←	→	
Work in Japan			←	→		←	→		←	→		
Reports	#1			#2			#3			#4		#5

Attachment 6

Phase 2 of the technical assistance for the improvement of Nacala Port (draft)

1. Duration
   Start from April 2015 and last until a few months after the completion of the rehabilitation projects

2. Counterpart agency
   MTC, INATTER, CFM, CDN, PN

3. Scope
   Port administration, cargo handling, terminal operation, infrastructure maintenance, equipment maintenance

4. Objectives
   1) To strengthen the counterpart agencies aiming to develop sustainable port administrative capacity in Mozambique
   2) To help optimize the use of the facility and equipment provided by Japanese ODA aiming to increase the cargo handling productivity
   3) To help maintain the facility and equipment in good condition aiming to prolong their serviceable life
   4) To reform legal frameworks regarding Mozambican ports.

5. Backgrounds
   Since 2012, JICA has been extending technical assistance to the Mozambican side for the improvement of Nacala Port and achieved considerable capacity development for counterparts. Continuing the technical assistance will strengthen the institutional capacity of the Mozambican side and thus maximize the benefit of the port rehabilitation projects currently carried out by JICA and MTC. INATTER, a newly created governmental entity, will serve as a regulator for the port sector as well and is in need of capacity building.

6. Programs of technical assistance
   The technical assistance team and Mozambican counterparts will jointly carry out the following programs through discussions, lectures in Mozambique and Japan, and site monitoring. With respect to port administration, Nacala Port will be taken

up as a showcase of conceded ports in Mozambique.

1) Port administration (Counterparts: MTC (INATTER), CFM, CDN)
   A) Review of the legal frameworks regarding Mozambican ports in comparison with those in other countries
   B) Prepare guidelines to build a proper legal framework for Mozambican ports
   C) Suggestions on the desirable legal framework for Mozambican ports responding to the draft legislation prepared by the Mozambican side
2) Terminal operation (Counterparts: CDN, PN)
   A) OJT for Vessel operation planning
   B) OJT for Yard operation planning
   C) Documentation works
   D) Terminal operation management
3) Infrastructure maintenance (Counterparts: MTC, CFM, CDN, PN)
   A) Suggestions on the rehabilitation of the South Wharf
   B) Suggestions on time-series analyses of the periodically monitored data
   C) On-site study of civil works
4) Equipment maintenance (Counterparts: CFM, CDN, PN)
   A) OJT for RTG maintenance
   B) OJT for RTG operation

8. 第 4 回 JCC (第 10 次派遣, 2015 年 1 月)

Conclusion
of
The Fourth Joint Coordination Committee
for
The Project for Improvement of Nacala Port
in Republic of Mozambique

The fourth meeting of the Joint Coordination Committee (hereinafter referred to as "JCC") for the Project for Improvement of Nacala Port in Republic of Mozambique (hereinafter referred to as "the Project") was held on February 10, 2015 at the MTC office in Maputo. The attendants are listed in Attachment 1.

At the meeting of JCC, the JICA expert team for the Project (hereinafter referred to as "the Project Team") presented the project completion report outlining the project achievements (Attachment 2). In the presentation, the Project Team appreciated proactive actions taken by the Mozambican side in such areas as the clarification of technology transfer needs, preparation of infrastructure inspection report and maintenance plan, compilation of safety regulations, implementation of on-site infrastructure monitoring, improvement in equipment availability ratio, and upgrading of the Phaeros system. The Project Team applied PDM (project design matrix) and monitoring indicators to show that the Project had achieved the expected outcomes. PDM and monitoring indicators were completed and confirmed in the wrap-up meeting in Nacala (Attachment 3). The Project Team also identified areas in need of further improvement such as port administration, terminal operation, infrastructure maintenance, and equipment maintenance.

JCC agreed that the Project was successfully completed and commended the active participation of all parties concerned. JCC also concurred on the importance of further improvement of Nacala Port. The Mozambican side requested technical support from JICA in pursuing efforts to further improve Nacala Port. JICA responded that it would support those efforts through dispatch of short term experts and overseas training, and the Mozambican side agreed to the basic concept of the idea proposed by JICA.

Maputo, February 10, 2015

Masahiro Yoshimi
Executive Technical Advisor to
Director General
Infrastructure and Peacebuilding
Department, JICA

Dr. Ana Matusse Dimande
Coordinator,
Nacala Port Development Project
Ministry of Transport & Communications

Mitsuhiko Okada
JICA Team Leader
The Project for Improvement of
Nacala Port in Republic of Mozambique

(Attachment 1)

REPÚBLICA DE MOÇAMBIQUE

MINISTÉRIO DOS TRANSPORTES E COMUNICAÇÕES

PROJECTO DE DESENVOLVIMENTO DO PORTO DE NACALA

TECHNICAL ASSISTANCE FOR NACALA PORT REHABILITATION

4th JCC

10-02-2015

Ord. Nr.	Name	Institution	Contacts		Signature
			Email	Cell	
1	Ana dimande	INATTER/PDPN	anadimande@yahoo.com.br	825308568	[signature]
2	Mitsuhiko Okada	OCDI	m-okada@ocdi.or.jp	822712128	岡田光彦
2	Kihoshi Nakashima	OCDI	nakashima@ocdi.or.jp	820627578	中島 潔
3	Teruki Eto	OCDI	eto@ocdi.or.jp	822712127	江藤輝紀
4	Susumu Kimura	OCDI	kimura@ocdi.or.jp	823542823	木村 進
5	Antonio Bulande	INATTER/PDPN	antoniobulande@yahoo.com.br	824657105	Antonio Bulande
6	Filipe Mapangane	INATTER/PDPN	filipe.mapangane@gmail.com		
7	Antonio Quimisse	MTC/PDPN	aquimise@yahoo.com.br		
8	Rosa Machava	MTC/PDPN	rosamachava@gmail.com	829168190	Rmachava
9	Fernando Ouana	MTC/DEI	[illegible]@gmail.com	820265829	[signature]
10	Anibal Manave	CFM	anibal.manave@cfm.co.mz	824346643	[signature]
11					

REPÚBLICA DE MOÇAMBIQUE

MINISTÉRIO DOS TRANSPORTES E COMUNICAÇÕES

PROJECTO DE DESENVOLVIMENTO DO PORTO DE NACALA

TECHNICAL ASSISTANCE FOR NACALA PORT REHABILITATION

4th JCC

10-02-2015

Ord. Nr.	Name	Institution	Contacts		Signature
			Email	Cell	
12	KATSUYOSHI SUDO	JICA	Sudo.Katsuyoshi@jica.go.jp	823170300	須藤勝義
13	Chiharu Morita	JICA	Morita.Chiharu@jica.go.jp	823209500	森田千晴
14	Akiko Shimohira	JICA	Shimohira.Akiko@jica.go.jp	82 305 85 15	下平明子
15					
16	Tobuaki Kuribayashi	JICA	Kuribayashi.Nobuaki@jica.go.jp	82 491 8006	
17	Masahiro YOSHIMI	JICA HQ	Yoshimi.Masahiro@jica.go.jp	81 2947116	吉見昌宏
18	Yoshimoto Koyanagi	JICA HQ	koyanagi.yoshimoto@jica.go.jp	86 258 4907	小柳柱泉
19					
20					
21					
22					
23					

(Attachment 2)

PROJECT COMPLETION REPORT

THE PROJECT FOR IMPROVEMENT OF NACALA PORT

FEBRUARY 2015

Japan International Cooperation Agency (JICA)

The Overseas Coastal Area Development Institute of Japan (OCDI)

Outline of the Project

Based on the Record of Discussions signed on December 22, 2011 between the Mozambican and Japanese sides

The first technical assistant mission (Project Team) arrived in Mozambique in April 2012

JICA dispatched10 missions to Mozambique and received 35 counterparts in Japan during the course of the Project

The Project Team and Mozambican counterparts jointly held 66 taskforce meetings dealing with specific needs in Nacala Port

(Attachment 3)

Records of activities of the JICA Project Team in Nacala

The JICA expert team for the Project for Improvement of Nacala Port (hereinafter referred to as "the Project Team") visited Nacala from January 29 to February 7, 2015. During the visit, the Project Team and Mozambican counterparts jointly carried out various activities including discussions, presentations, and site monitoring. At the wrap-up meeting on February 6 (Attendant list is as attached (Attachment A)), both sides confirmed that the Project had achieved the expected outcomes as indicated by the Project Design Matrix (Attachment B) and monitoring indicators (Attachment C). Mozambican counterparts appreciated the achievements of the Project and expressed expectations of continuous technical assistance from Japan. The Project Team suggested that following steps would be meaningful for the efficient operation of Nacala Port:

1. To enhance storm readiness, Nacala Port should establish a special committee responsible for measures to be taken against strong winds. Nacala Port needs to keep track of wind conditions by installing anemometers and following weather forecast (CDN).
2. To provide off-dock container storage capacity, the dry terminal should be paved when the rainy season ends in April (PN/TN).
3. To prevent excessive congestion of the container yard, Nacala Port should keep track of container inventory and keep it under sustainable condition. It is advisable to move out long dwelling containers to off-dock container yards (PN).
4. To keep the container yard behind the South Wharf in operable condition, subsided areas should be repaired when the rainy season ends in April. Periodical inspection would be useful to know the progress of deterioration (CFM/CDN/TN).

On February 5, JICA and MTC jointly organized a seminar to make pertinent agencies informed of the Project achievements and to exchange views on the future functions of Nacala Port among people concerned. This seminar turned out successful thanks to the active participation of port-related organizations (Seminar program and attendant list are as attached (Attachment D)).

Nacala, February 6, 2015

岡田光彦

Mitsuhiko Okada
JICA Team Leader
The Project for Improvement of
Nacala Port in Republic of Mozambique

Martinho F. Mafumo
Maritime Administrator,
Maritime Administration of Nacala

February 2015

1

(Attachment A)

Attendance List for the Technical Transfer Sessions provided by the JICA Expert Team (Jan.-Feb. 2015)

Category/Area of Training	General	Session No.	6
Title	Wrap-up Meeting		
Date & Time	14:00-16:00, February 06, 2015		
Lecturer	JICA Expert Team		
Venue	PN Conference Room		

No.	Name	Title / Section	Org.	Signature
1	Martinho F. Mafumo	Maritime Administrator	MTC	[signature]
2	Arzílio Josué Mata	Supervisor/ Civil Engineer	CFM (Office of Nacala Port Rehabilitation Project)	[signature]
3	Anabela Emilia Matsinha	Supervisor/ Civil Engineer		[signature]
4	Tomás Fortunato Ngca	Supervisor/ Mechanical Engineer		[signature]
5	Milione Changala	Supervisor/ Electrical Engineer		[signature]
6	José Osias Cherinda	Supervisor/ H.S.T		[signature]
7	Carmona Macobola	Civil Engineer	CFM (DEPE)	
8	Alfredo Rafael Sigola	Chef of Infrastructure Dept.	CFM North (Nacala)	
9	Drasnildo Luis Monteiro	Chef of Infrastructure Dept.		
10	Alfredo Artur Mafuca	Oil Terminal Manager		
11	Braulio Franco Catutula	Port Operation		
12	Nino Jorge Lobo	Port Operation		
13	Abubacar Mecuta	Port Security		[signature]
14	Fabio Frasao	Port Director	CDN	[signature]
15	Francisco David	Safety Consultant		
16	Ibraimo Mussa	Operation Analyst		[signature]
17	Agostinho Langa	PN Director/COO	PN	[signature]
18	Loni Shott	Chief of Comercial Division		[signature]
19	Luis Machado	Chief of Port Operations Division		[signature]
20	Abudo Selle	Project Management Unit		[signature]
21	Vasco Cunha	Chief of Maintenance Division		
22	António Gabriel	Chief of Security Division		
23	Neimo Induna	CCOP		[signature]
24	Denilson Hamide	Branch Manager	TN	[signature]
25	Helvio Salomao	Operation Manager		[signature]
26	Carmen Amaral	Safety Officer		
27	Abdurremane cadre	General Cargo Supervisor		
28	Mitsuhiko OKADA	JICA Expert/ Team Leader	JICA	岡田光彦
29	Kiyoshi NAKASHIMA	JICA Expert		中島潔
30	Teruki ETO	JICA Expert		Eto
31	Susumu KIMURA	JICA Expert		S. Kimura
32	Nobuaki KURIBAYASHI	JICA Mozambique		[signature]
33	Camilo Medina	EHS PN	PN	[signature]
34	Anibal Hamave	Adviser to the Board	CFM	[signature]

The Project for the Improvement of the Nacala Port

(Attachment B)

Project Design Matrix

Description of PDM		Achievements and future actions		
Narrative summary of outputs	Objectively verifiable indicators	Outputs up to January 2015	Evaluation of the progress as of January 2015	Forthcoming actions and recommendable actions (Items in parenthesis are out of the scope of the current TA project)
Port development strategy is developed	Port development strategy is drafted	# Revised port development plan was prepared and agreed on among pertinent parties (September 2012)		# (Master plan beyond the short-term development) # (Rehabilitation plan of the South Wharf)
The implementation structure of the short-term development is revised and established	Short-term development plan is revised	# Grant aid project started (March 2014) # Loan-1 project started D/D	Targets accomplished	
The capacity of the port administration and management is developed	# Regulation on port administration and management is drafted # Port is administered and managed according to the regulation	# Operational regulation and safety regulation are drafted # Safety regulation was announced to stakeholders in a seminar (April and November 2014), approved by the CDN board (June 2014) and then implemented (December 2014)	Targets accomplished	Operational regulation will be finalized and implemented (targeted for May 2015)
Cargo handling skill is improved	# Cargo handling capacity per hour increases # Accident rate decreases # Number of seminar/training and participants who pass the training exam increases	# Cargo handling efficiency is gradually improving through the introduction of Phaeros and segregation of containers which has resulted in a decrease in vehicle turn-round time # Accidents are recorded and preventive measures are analyzed # 148 counterparts participated in 13 sessions of lecture/discussions on cargo handling # Phaeros (terminal operation system) is operational and all agents are participating in the system # Leveling of the dry terminal was completed (September 2014) but severe rain falls caused damages requiring the terminal to be paved # New spreaders arrived (September 2014) and are now in use	Targets accomplished	# Wireless data transmission will be installed before mid-March # Container handling productivity needs to be monitored by 3 universally applied indicators # 4 yard planners will be hired # Lessons learned from accidents should be circulated among all employees
Maintenance skills of the port facility and equipment is developed	# Number of maintenance technicians increases # Maintenance cost for existing facility and equipment decreases # Number of seminar/training and participants who pass the training exam	# Three civil engineers (two from CFM and one from PN) are assigned for infrastructure maintenance # Counterparts received infrastructure monitoring training using survey equipment (September 2014) # Downtime ratio of equipment decreased (from 39 % in 2012 to 21 % in 2014) # In daily operation meetings	Targets accomplished	# Further study and policy decision on the rehabilitation of the South Wharf considering the suggestions of JICA Team # Compilation of a spare parts inventory list

Description of PDM		Achievements and future actions		
	increases	equipment conditions are reported and shared among all people concerned # 110 counterparts participated in 15 sessions of lecture/discussions on infrastructure maintenance # Counterparts understood the survey and analysis needed to determine the measures to rehabilitate the South Wharf # A Mozambican delegation had a technical meeting on the South Wharf with Japanese counterparts in Japan (November 2014) # 84 counterparts participated in 9 sessions of lecture/discussions on equipment maintenance # Periodical maintenance plan for equipment is developed and implemented		

(Attachment C)

Monitoring Indicators

Subject	Indicators	Milestones/goals	Baseline	Achievements
Port development planning	Progress of investment packages	Start of Grant aid Start of Loan-1 Start of Loan-2	Investment packages not started yet as of April 2012.	Grant aid project started (March 2014) # Loan-1 project started D/D (May 2014)
Port administration and management	Number of participants in seminars and workshops	Training in Japan in 2012, 2013 and 2014 Training in Angola in 2013 Training in Nacala and Maputo		Training in Japan in 2012, 2013, 2014 (In total, 31 counterparts received technical transfer in Japan) Key counterpart training in 2013 substituted for Training in Angola
Cargo handling	1. Gross vessel productivity of container handling 2. Net vessel productivity of container handling 3. Net gang productivity of container handling 4. Dwelling time of containers	10 boxes (=13.0 TEU) /SG/hour as Net Productivity	1. 6.7 box/hour/vessel (2011) 2. 7.6 box/hour /vessel (2011) 3. 5.0 box/hour/gang (2011) 4. 8.55 days for transit containers (2012)	1. 8.2 box/hour/vessel (2014) 2. 10.6 box/hour/vessel (estimated by the Project Team, 2014) 3. 6.3 box/hour/gang (estimated by the Project Team, 2014) 4. Average dwelling time is not recorded
Maintenance of facilities	Frequency of port area patrol (regular inspection)	Regular inspection is started Budget for maintenance is allocated.	No regular inspection No budgetary allocation	Inspection of infrastructure started in August 2014 MT 15,380,000 is requested to the management for FY 2015 budget
Maintenance of equipment	Working time ratio of equipment Annual budgetary allocation for facility maintenance	60-70 % Sufficient amount of budget	51.77 % (2012) MT 27,770,000 (2011)	79 % (2014) MT 92,369,000 is allocated in FY 2015 budget

(Attachment D)

Nacala Port Development Project
Technical Assistance Project in Nacala-Porto

República de Moçambique
Ministério dos
Transportes e Comunicaçoes

Japan International
Cooperation Agency

Seminar Program

5th February, 2015

1. Venue

Conference Center, Afrin Nacala Hotel, Nacala
(Rua 1, Talão A7, Bairro Maiaia, Nacala-Porto, Tel:26-526 600)

2. Time & Date

09:30-12:00, 5th February, 2015

3. Program (6 presentations, 20 minutes each = 120 minutes)

(1) JICA technical assistance for Nacala Port – achievements and future challenges (by JICA Team)
Mr. Mitsuhiko Okada, Team Leader, Japan International Cooperation Agency (JICA)

(2) Improvement in infrastructure and equipment (by CFM)
Mr. Arzílio Josué Mata, Supervisor/ Civil Engineer, Portos e Caminhos de Ferro de Moçambique (CFM)

(3) Strengthening of port functions at Nacala, the gateway of the Nacala Corridor (by CDN)
Mr. Fabio Frasão, Port Director, Corredor de Desenvolvimento do Norte (CDN)
Mr. Ibraimo Mussa, Operation Analyst, Corredor de Desenvolvimento do Norte (CDN)

(4) Improvement in terminal operation (by PN)
Mr. Neimo Induna, CCOP, Portos do Norte (PN)

(5) Expectations for future development of Nacala Port (by CMACGM and MSC)
Mr. Hinelder Ferreira, Branch Manager, CMA CGM Mozambique
Mr. Simon Kanjanga, Branch Manager, Mediterranean Shipping Company (MSC) Mozambique

12:00-13:30 Lunch

Attendance List for the Seminar on Nacala Port (February 05, 2015)

Category/Area of Training	General	Session No.	-
Title	Seminar on Nacala Port		
Date & Time	09:30 - 12:00, February 05, 2015		
Organizer	JICA Expert Team		
Venue	Conference Center, Nacala Afrin Hotel		

No.	Name	Title / Section	Org.	Signature
1	Mitsuhiko OKADA	JICA Expert/ Team Leader	JICA	
2	Kiyoshi NAKASHIMA	JICA Expert		
3	Teruki ETO	JICA Expert		
4	Susumu KIMURA	JICA Expert		
5	Akiko SHIMOHIRA	JICA Mozambique		
6	Nobuaki KURIBAYASHI	JICA Mozambique		
7	Dionísio Vinhereck	Interpreter		
8	Martinho F. Mafumo	Maritime Administrator	MTC	
9	Anibal Manave	Advisor of the Board	CFM (Maputo)	
10	Arzílio Josué Mata	Supervisor/ Civil Engineer	CFM (Office of Nacala Port Rehabilitation Project)	
11	Anabela Emilia Matsinha	Supervisor/ Civil Engineer		
12	Tomás Fortunato Ngca	Supervisor/ Mechanical Engineer		
13	Milione Changala	Supervisor/ Electrical Engineer		
14	José Osias Cherinda	Supervisor/ H.S.T		
15	Carmona Macobola	Civil Engineer	CFM (DEPE)	
16	Alfredo Manuel Lipeque	CFM Nacala Director	CFM North (Nacala)	
17	Alfredo Rafael Sigola	Chef of Infrastructure Dept.		
18	Drasnildo Luis Monteiro	Chef of Infrastructure Dept.		
19	Alfredo Artur Mafuca	Oil Terminal Manager		
20	Braulio Franco Catutula	Port Operation		
21	Nino Jorge Lobo	Port Operation		
22	Abubacar Mecuta	Port Security		
23	Fabio Frasão	Port Director	CDN	
24	Francisco David	Safety Consultant		
25	Ibraimo Mussa	Operation Analyst		

No.	Name	Title / Section	Org.	Signature
26	Agostinho Langa	PN Director/COO	PN	
27	Loni Shott	Chief of Comercial Division		
28	Luis Machado	Chief of Port Operations Division		
29	Neimo Induna	CCOP		
30	António Gabriel	Chief of Security Division		
31	Vasco Cunha	Chief of Maintenance Division		
32	Abudo Sele	Project Management Unit	PN	
33	Cremildo/Márcio	DASSO		
34	Denilson Hamide	Branch Manager	TN	
35	Helvio Salomao	Operation Manager		
36	Carmen Amaral	Safety Officer		
37	Jose Samo	RH/Adm		
38	~~Abdurremane cadre~~ JAIME PEDRO	General Cargo Supervisor		
39	Domingos Magaia	Representative	Custom Office in Nacala	
40	Renato Manuel Furruma	Chief Officer	Migration Office in Nacala	
41	Emilia Miranda Abuchir	Officer	INAHINA	
42	Stelio Rodrigues	General Director	Kudumba Investments	
43	Geoffrey Chintingiza	Operation manager	Mocargo Nacala	
44	Ibraimo Assumane	Branch Manager	Manica Freight Services	
45	Hinelder FERREIRA	Branch Manager	CMA-CGM	
46	Simon Kanjanga	Branch Manager	MSC	
47	Carolyn Kathewera	Nacala Branch Manager	Maersk Line	
48	CHAKI ABOOBACAR	ASSESSOR DO PRESIDENTE	CMCN	
49	Carlos Muafiguezer	Sector de Marketing	GAZEDA	
50	Luis Diogo	Maintenance	PN	

The Project for the Improvement of the Nacala Port

Appendix-3:　　タスクフォース議事録

1. General

Dispatch	Session No.	Title
7th	1	Discussion on TA plan of 7th dispatch and monitoring indicators
7th	9	Wrap-up meeting
8th	1	Discussion on Technical Assistance plan of 8th dispatch
8th	11	Wrap-up Meeting: Steps to be taken until the 9th dispatch (September, 2014) and Progress of the Project based on PDM
9th	1	Discussion on Technical Assistance plan of 9th dispatch
9th	2	Discussion on Progress since April
9th	3	Review of PN statistics
9th	13	Wrap-up meeting
10th	1	Presentation of Completion Report
10th	6	Wrap-up Meeting

Session 1 (General)	**Discussion on TA plan of 7th dispatch and monitoring indicators**
7th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 11th December, 2013 **Time:** 09:30 to 11:30

Participants

CFM North	Braulio Catutula	Operations Officer
	Abubacar Mecuta	Chief of Security & Safety
	Draisnildo Luis Monteiro	Civil Technician A
CDN	Antonio Frederico Candido	Deputy Port Director
	Ibraimo Mussa	Port Operation
PN	Loni Shott	Deputy Port Director
	Lucas Jose Cipriano	Port Operation Director
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Ohno and Kuribayashi	

Agenda

1. JICA TA Team presented the 7th dispatch program and was basically agreed.
2. JICA TA Team presented the 3rd Progress Report.

Session 9 (General)	**Wrap-up meeting**
7th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 16th December, 2013 **Time:** 17:00 to 18:00

Participants

MTC	Ana Matusse Dimande	Project Coordinator
CFM	Paulo Tarmamade	Advisor of the Board of Directors
	Abubacar Mecuta	Chief of Security & Safety
CDN	Ibraimo Mussa	Port Operation
PN	Lucas Jose Cipriano	Port Operation Director
	Afonso Vasco da Cunha	Maintenance Director
	Neimo da Esperanca Indunia	Maintenance/CCOP
	Bonifacio Muassabao	Port Operation Division (POD)
	Cremildo Rafael Madeira	Environment, Health & Safety
	Gabriel Joao Antonio	Security
TN	Julio	Supervisor
	Sunil Ratnasiri	Supervisor
	Carmen	Security
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. Steps to be taken until the 8th dispatch (scheduled in April 2014) were discussed.

Session 1 (General)	**Discussion on Technical Assistance plan of 8th dispatch**
8th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 21st April, 2014 **Time:** 09:30 to 11:30

Participants

CFM	Braulio Catutula	IT Manager
	Alfredo Artur Mafuca	Operations Manger
	Alfredo Segola	Maintenance Manager
CDN	Antonio Frederico Candido	Deputy Port Director
PN	Loni Shott	Deputy Port Director
	Lucas Jose Cipriano	Project Management Unit
	Luis Jorge Machado	Chief of Port Operation Division
	Abudo Sele	Project Management Unit
TN	Denilson Hamide	Director
JICA Expert Team	Okada, Nakashima, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. Both sides agreed on the time table of the 8th dispatch presented by JICA Team
2. JICA TA Team presented the 4th Progress Report
3. JICA Team presented a tentative plan of the this year's counterpart training in Japan and asked for the designation of participants

Session 11 (General)	**Wrap-up Meeting: Steps to be taken until the 9th dispatch (September, 2014) and Progress of the Project based on PDM**
8th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 28th April, 2014 **Time:** 09:30 to 11:30

Participants

MTC	Ana Matusse Dimande	Project Coordinator
CFM	Anabela Matsinha	Civil Engineer
CDN	Antonio Frederico Candido	Deputy Port Director
	Ibraimo Mussa	CDN Officer (Port Operation)
PN	Agostinho F. Langa Jr.	Operation Director/Executive Committee
	Lucas Jose Cipriano	Project Management Unit
	Luis Jorge Machado	Chief of Port Operation Division
	Loni Schott Ribeiro	Deputy Port Director
	Abudo Sele	Project Management Unit
JICA Expert Team	Okada, Nakashima, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

It was agreed that the following steps should be taken by both sides before the 9th dispatch.

1. By the Mozambican counterparts
   - Start of the periodical monitoring of infrastructure
   - Preparation for the introduction of survey equipment
   - Completion of the dry terminal upgrades
   - Introduction of new spreaders with flippers
   - Monitoring of the three container handling productivity indicators (Berth productivity, Gross productivity per crane, net productivity per crane)
   - Implementation of the safety regulation and operation regulation
   - Monitoring of EMS for urgent rehabilitation
   - Review of JICA Team's suggestions on the South Wharf
2. By the JICA Team
   - Procurement of survey equipment
   - Preparation of an onsite training program for infrastructure monitoring

Session 1 (General)	**Discussion on Technical Assistance plan of 9th dispatch**
9th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 4th September, 2014 **Time:** 09:30 to 10:30

Participants

MTC	Martinho F. Mafumo	Maritime Administrator
CFM	Alfredo Artur Mafuca	Oil Terminal Manager
	Alfredo Rafael Sigola	Ncala Infrastructure Chiel
	Anabela Matsinha	Supervisor Civil Engineer
	Alfredo Manuel Lipeque	Branch Manager
	Edgar Jorge	Supervisor Chief Engineer
CDN	Ibraimo Mussa	Port Operations Analyst
	Fabio Frasao	Port Director
PN	Agostinho F. Langa Jr.	Director/COO
	Lucas Jose Cipriano	Project Management Unit
	Loni Schott Ribeiro	Chief of the Commercial Division
	Abudo Sele	Project Management Unit
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. Both sides agreed on the program of the 9th dispatch presented by JICA Team
2. Mozambican counterparts were requested to participate and present the progress since the 8th dispatch in relevant sessions

Session 2 (General)	**Discussion on Progress since April**
9th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 4th September, 2014 **Time:** 14:30 to 16:00

Participants

MTC	Martinho F. Mafumo	Maritime Administrator
CFM	Alfredo Rafael Sigola	Ncala Infrastructure Chiel
	Edgar Jorge	Supervisor Chief Engineer
	Goncalves Chizuzu	Port Operation
CDN	Ibraimo Mussa	Port Operations Analyst
PN	Lucas Jose Cipriano	Project Management Unit
	Luis Jorge Machado	Chief of Port Operation Division
	Afonso Vasco da Cunha Jr.	Maintenance Director
	Loni Schott Ribeiro	Chief of the Commercial Division
	Abudo Sele	Project Management Unit
TN	Sunil Ratnasiri	Supervisor
	Denilson Hamide	Director
	Jose Samu	Operation
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

JICA Team reminded the participants of the steps to be taken agreed on in April.

1. For Mozambican counterparts
   - Start of the periodical monitoring of infrastructure [done]
   - Preparation for the introduction of survey equipment [done]
   - Completion of the dry terminal upgrades [underway]
   - Introduction of new spreaders with flippers [underway]
   - Monitoring of the three container handling productivity indicators (Berth productivity, Gross productivity per crane, net productivity per crane) [underway]
   - Implementation of the safety regulation [done] and operation regulation [underway]
   - Monitoring of EMS for urgent rehabilitation [not done]
   - Review of JICA Team's suggestions on the South Wharf [not done]
2. For JICA Team
   - Procurement of survey equipment [done]
   - Preparation of an onsite training program for infrastructure monitoring [done]

Session 3 (General)	**Review of PN statistics**
9th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 5th September, 2014 **Time:** 9:30 to 11:00

Participants

MTC	Martinho F. Mafumo	Maritime Administrator
CFM	Braulio Franco Catutula	Port Operation
	Edgar Jorge	Supervisor Chief Engineer
	Goncalves Chizuzu	Port Operation
CDN	Antonio Frederico Candido	Cheif of Infrastructure Maintenance Dept.
	Ibraimo Mussa	Port Operations Analyst
PN	Lucas Jose Cipriano	Project Management Unit
	Loni Schott Ribeiro	Chief of the Commercial Division
	Mohamad Richard	Commercial Division
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

JICA Team made a presentation on the performance of Nacala Port based on the PN statistics

Through discussions, backgrounds of the statistical trend were identified and suggestions were made accordingly

1. For accidents:
   - In 2013, registered accidents increased significantly due to the improved awareness of safety issues and the increase in oversize cargo
   - JICA Team suggested that a safety committee should be organized and lessons learned from accidents should be circulated to all employees
   - JICA Team urged that people should exercise additional caution responding to the port congestion during urgent rehabilitation projects
2. For cargo volume:
   - The decrease in 2012 and the remarkable increase in 2013 was due to the decline of transit cargo for Malawi and the increase in project cargo respectively
   - Natural gas exploitation related cargo and timber pallets are among the additional prospective cargo
   - JICA Team suggested that Nacala Port should keep track of the progress of PROSAVANA
3. For container cargo:
   - PN explained that coastal container traffic decreased due to its costs higher than trucking
   - PN referred to a recent stakeholder meeting aimed to reduce the coastal shipping costs
   - JICA Team responded that coastal shipping was generally more economical and eco-friendly than trucking and encouraged the efforts currently undertaken among stakeholders
4. For vessel calls:

- PN explained that the increase of vessel calls in 2013 was due to gas exploration activities and would not be sustainable

5. For container handling productivity
   - Container handling productivity has not improved during the last two years
   - PN explained that the continued use of inefficient ship gears and a lack of spreaders with flippers were the main reasons behind the lack of improvement
   - JICA Team suggested that PN should request shipping agents to improve vessel plans and also have its own ship planners
6. For available time ratio of equipment
   - Availability of cargo handling equipment has remarkably improved due to the following factors: introduction of new equipment resulting in less strain in old equipment, OJT for maintenance personnel, and improvement in the spare parts procurement system
   - Both sides recognized the need of renewed efforts to deal with the increase in the number of models of reach stackers

Session 13 (General)	**Wrap-up meeting**
9th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 15th September, 2014 **Time:** 9:30 to 11:30

Participants

MTC	Martinho F. Mafumo	Maritime Administrator
CFM	Anabela Matsinha	Supervisor Civil Engineer
	Arzilio Mata	Supervisor Civil Engineer
	Milione Changala	Supervisor Electrical Engineer
	Goncalves Chizuzu	Port Operation
	Floclordo Cumbane	Port Operation
	Ohairo Mario	Port Security
CDN	Ibraimo Mussa	Port Operations Analyst
PN	Lucas Jose Cipriano	Project Management Unit
	Luis Jorge Machado	Chief of Port Operation Division
	Abudo Sele	Project Management Unit
TN	Sunil Ratnasiri	Supervisor
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

Both sides confirmed the progress of the Project and agreed that the following areas were in need of continuous efforts and attention

1. Infrastructure
   - Periodical inspection
   - Policy decision on the rehabilitation of the South Wharf
2. Cargo handling
   - Nomination of yard planners and vessel planners and their capacity development
   - Start of handling laden containers in the dry terminal upon completion of its upgrades and introduction of reach stackers
   - Review of the Phaeros system to decide whether it is useful for the entire container terminal operation
   - Monitoring of 3 container handling productivity indicators
3. Equipment
   - Clarification of the responsible party and start of preparation for the maintenance of equipment introduced in ODA projects
   - Sharing the information on the conditions of each equipment
   - Compilation of an spare parts inventory list
4. Safety/Operation
   - Additional attention during urgent rehabilitation projects

- Circulation of the lessons learned from accidents among all employees
- Finalization and implementation of the Operational Regulations

The need of continued technical assistance was discussed and the following subjects were identified as priority areas

1. Port administration
   - Review of the Mozambican port administration system in comparison with those in other countries
   - Suggestions on the desirable distribution of administrative functions among pertinent agencies (government, concessionaire, and operator)
   - Suggestions on the desirable legal framework for national port administration
2. Terminal operation
   - OJT for Vessel planning
   - OJT for Yard planning
   - Documentation works
   - Terminal operation management
3. Infrastructure maintenance
   - Suggestions on the rehabilitation of the South Wharf
   - Suggestions on time-series analyses of the periodically monitored data
   - On-site study of civil works
4. Equipment maintenance
   - OJT for RTG maintenance
   - OJT for RTG operation

2. TF-1: Port Planning

Dispatch	Session No.	Title
4th	3	Meeting for Port Plan and Meeting for Port Administration and Management
4th	4	Meeting for Port Plan (World Shipping Trend)
4th	5	Meeting for Port Plan
5th	3	Meeting for Port Plan
5th	6	Meeting for Port Plan
5th	8	Meeting for Port Plan
6th	5	Meeting for Port Plan
6th	7	Meeting for Port Plan

Session 3 (TF-1)	**Meeting for Port Plan and Meeting for Port Administration and Management**
4th Dispatch	**Date:** 12th December, 2012 **Time:** 14:00 pm to 16:30 pm **Place:** Conference Room of CDN Nacala

Participants

MTC	Dr. Ana Dimande	Project Coordinator
CFM	Alfredo Mafuca	Manager, Port Operations/Data Handling
	Abubacar Mecuta	Manager, Port Environment
	Assane Daudo	Manager, Port Operations/Data Handling
	Ossufo Bacar	Coordinator, Port Operations
	Braulio Catutula	Coordinator, Port Operations
	Lucilia Mangue	Coordinator, Port Operations
	Cesar Antonio	Coordinator, Maintenance/Infrastructures
	Jose Muapalame	Coordinator, Maintenance/Infrastructures
	Emanuel Rosse	Floorwalker, Port Operations
	Goncalves Chizuzu	Floorwalker, Port Operations
	Nino Lobo	Floorwalker, Port Operations
CDN	Loni Shot	Director, Logistics
	Lucas Cipriano	Director, Port Operations
	Bonifacio Muassabao	Manager, Port Operations
	Eusebio Amando	Pilot/Manager, Port Operations
	Eusebio Anania	Coordinator, Port Operations
	Atumane Quinane	Coordinator, Port Operations
PN	Rui Fonseca	
TN	Denilson Hamide	Director
	Raime Pachinuapa	Manager
	Julio	Coordinator
JICA Expert Team	Nakashima, Miyaji, Eto, Kimura and Kuribayashi	

Agenda

1. Port management
2. Port planning system
3. World trends related to Ports and Harbours
4. Laws and regulations for port planning

Materials

1. Port Management
2. Japan's Port Management and The United States' Port Management

Session 4 (TF-1)	**Meeting for Port Plan (World Shipping Trend)**
4th Dispatch	**Date**: 13th December, 2012 **Time**: 14:00 pm to 16:00 pm **Place**: Conference Room of CDN Nacala

Participants

CFM	Alfredo Mafuca	Manager, Port Operations/Data Handling
	Abubacar Mecuta	Manager, Port Environment
	Assane Daudo	Manager, Port Operations/Data Handling
	Ossufo Bacar	Coordinator, Port Operations
	Braulio Catutula	Coordinator, Port Operations
	Lucilia Mangue	Coordinator, Port Operations
	Cesar Antonio	Coordinator, Maintenance/Infrastructures
	Jose Muapalame	Coordinator, Maintenance/Infrastructures
	Draisnildo Monteiro	Supervisor, Port Operations
	Emanuel Rosse	Floorwalker, Port Operations
	Goncalves Chizuzu	Floorwalker, Port Operations
	Nino Lobo	Floorwalker, Port Operations
CDN	Loni Shot	Director, Logistics
	Lucas Cipriano	Director, Port Operations
	Eusebio Anania	Coordinator, Port Operations
	Atumane Quinane	Coordinator, Port Operations
JICA Expert Team	Nakashima, Miyaji, Eto, Kimura and Kuribayashi	

Agenda

1. World Shipping Trend

Materials

1. Business of Shipping

Main Discussion Points

1. Mr. Nakashima, a JICA expert, made a presentation on the business of shipping and its recent trend.

Session 5 (TF-1)	**Meeting for Port Plan**
4th Dispatch	**Date**: 14th December, 2012 **Time**: 14:00 pm to 16:30 pm **Place**: Conference Room of CDN Nacala

Participants

MTC	Dr. Ana Dimande	Project Coordinator
CFM	Alfredo Mafuca	Manager, Port Operations/Data Handling
	Abubacar Mecuta	Manager, Port Environment
	Assane Daudo	Manager, Port Operations/Data Handling
	Ossufo Bacar	Coordinator, Port Operations
	Braulio Catutula	Coordinator, Port Operations
	Lucilia Mangue	Coordinator, Port Operations
	Cesar Antonio	Coordinator, Maintenance/Infrastructures
	Jose Muapalame	Coordinator, Maintenance/Infrastructures
	Draisnildo Monteiro	Supervisor, Port Operations
	Emanuel Rosse	Floorwalker, Port Operations
	Goncalves Chizuzu	Floorwalker, Port Operations
	Nino Lobo	Floorwalker, Fie Fighting Team
CDN	Loni Shot	Director, Logistics
	Lucas Cipriano	Director, Port Operations
	Bonifacio Muassabao	Manager, Port Operations
	Eusebio Anania	Coordinator, Port Operations
	Atumane Quinane	Coordinator, Port Operations
TN	Julio	Coordinator
JICA Expert Team	Nakashima, Miyaji, Eto, Kimura and Kuribayashi	

Agenda

1. Environment considerations
2. Coastal Zone Management and Bay Ares Management

Materials

1. Coastal Zone Management and Bay Ares Management

Main Discussion Points

1. Mr. Miyaji, who is JICA expert made a speech of reviews of previous lecture.
2. Mr. Miyaji made a special presentation of Coastal Zone Management and Bay Ares Management
3. In addition, Tokyo Bay Area was introduced as a case study including the history of reclamation, port's activities and navigation of channels

Session 3 (TF-1)	**Meeting for Port Plan**
5th Dispatch	**Date:** 12th April, 2013 **Time:** 14:00 to 15:00 **Place:** Conference Room of CDN, Nacala

Participants

MTC	Ana Matusse Dimande	Project Coordinator
CFM	Braulio Catutula	Coordinator, Port Operations/Data Handling
	Alfredo Artur Mafuca	Manager, Port Operations/Data Handling
	Emanuel Rosse	Floorwalker, Port Operations
	Gonçalves Chizuzu	Floorwalker, Port Operations
	Abubacar Mecuta	Manager, Port Environment
	Ossufo Bacar	Coordinator,
CDN	Aderval Acioli Matos	Port Director
	Candido Frederico	Maintenance Department
	Antonio F. Candido	
PN	Agositnho F. Langa	Operation Director/Executive Committee
	Lucas Cipriano	Port Operations
	Eusebio Ananias	Port Operations
	Atumane Quinane	Port Operations
	Gabriel Joao	Port Operations
	Cremildo Madeira	EHS/Safety
JICA Expert Team	Okada, Nakashima, Kimura, Kawabata, and Kuribayashi	

Agenda

1. How to evaluate the congestion of the terminal
2. How to find ways to improve productivity
3. How to come up with the appropriate berth number

Materials

Port planning tools (1) berth occupancy

Session 6 (TF-1)	**Meeting for Port Plan**
5th Dispatch	**Date:** 13rd April, 2013 **Time:** 11:00 to 12:00 **Place:** Conference Room of CFM, Nacala

Participants

CFM	Jose Muapalame	Coordinator, CFM Pemba
	Assane Daude	Manager, Port Operations, CFM Pemba
	Cesar Antonio	Coordinator, Maintenance / Infrastructure, CFM Pemba
	Ossufo Bacar	CFM Pemba
JICA Expert Team	Okada, Nakashima, Kimura, Kawabata and Kuribayashi	

Agenda

1. How to evaluate the congestion of the terminal
2. How to find ways to improve productivity
3. How to come up with the appropriate berth number

Materials

Port planning tools (1) berth occupancy

Session 8 (TF-1)	**Meeting for Port Plan**
5th Dispatch	**Date:** 15th April, 2013 **Time:** 14:00 to 15:00 **Place:** Conference Room of CDN, Nacala

Participants

CFM	Braulio Catutula	Coordinator, Port Operations/Data Handling
	Alfredo Artur Mafuca	Manager, Port Operations/Data Handling
	Emanuel Rosse	Floorwalker, Port Operations
	Ossufo Bacar	Coordinator,
	Assane Daudo	
CDN	Candido Frederico	Maintenance Department
PN	Agositnho F. Langa	Operation Director/Executive Committee
	Lucas Cipriano	Port Operations
	Neimo Induma	Port Operations
	Luis Machado	Port Operations
	Evaristo Simoco	Law
JICA Expert Team	Okada, Nakashima, Kimura, Kawabata, and Kuribayashi	

Agenda

1. Macro forecast and micro forecast
2. Difference between ASEAN ports and sub-Saharan ports
3. Impacts of the productivity increase on the future cargo volume of Nacala Port
4. Strength of Nacala Port

Materials

Port planning tools (2) demand forecast

Session 5 (TF-1)	**Meeting for Port Plan**
6th Dispatch	**Place**: Conference Room of PN Nacala **Date**: 18th June, 2013 **Time**: 15:00 pm to 16:30 pm

Participants

CFM	Balamade Andinane	Technician (Category A)
	Nauria Mahonca	Technician (Category A)
	Aquital Agy Ibrahimo	Mechanical Engineer
	Arsenio Zimba	Hydraulic Engineer
	Atanasio Neves	Mechanical Engineer
	Miguel Jamisse	Mechanical Engineer
	Sergio Simao	Manager of Mosala
PN	Eusebio Ananias Ramos	Coordinator, Port Operations
	Cremildo Madeira	EHS/Safety
	Gabriel Joao	Chief of the Security Division
	Neimo Induna	Container Yard Manager
	Lucas Cipriano	Port Operation Manager
	Bonifacio Musabao	Port Operation
	Atmane Quinane	Port Operation
TN	Aboul Cadre	Technician
	Maricio Cleosego	Technician
	Denilson Hanli Pasolnard	Technician
JICA Expert Team	Nakashima, Eto, Kunita, Komoto, and Kuribayashi	

Agenda

Discussion on Safety During the Construction Works

Materials

Safety and Health Guide Osamu Kunita.pptx

Main Discussion Points

1. Dr.Kunita, who is JICA expert made a presentation on safety issues during the construction period.
2. Dr. Kunita made a presentation on the systematic way how to prevent the accident.
3. As the result, it is confirmed that the material provided by Dr. Kunita will be utilized to prevent or decrease the accidents.

Session 7 (TF-1)	**Meeting for Port Plan**
6th Dispatch	**Place**: Conference Room of PN Nacala **Date**: 19th June, 2013 **Time**: 10:30 am to 12:00 noon

Participants

CFM	Anabela Matsinha	Civil Engineer
	Balamade Andinane	Technician (Category A)
	Nauaia Mahonca	Technician (Category A)
	Aquital Agy Ibrahimo	Mechanical Engineer
	Arsenio Zimba	Hydraulic Engineer
	Atanasio Neves	Mechanical Engineer
	Miguel Jamisse	Mechanical Engineer
	Eusebio Ananias Ramos	Coordinator, Port Operations
	Sergio Simao	Matola Port Manager
CDN	Aderval Acioli Matos	Port Director
PN	Afonso Vasco da Cunha Jr.	Chief of the Maintenance Division
	Cremildo Madeira	EHS/Safety
	Gabriel Joao	Chief of the Security Division
	Neimo Induna	Container Yard Manager
	Marsio Connea	PN-SP Euope Coastal Engineer
JICA Expert Team	Nakashima, Eto, Kunita, Komoto, and Kuribayashi	

Agenda

Bulk Terminal Planning

Materials

Grain_Terminal_Kunita 2013_6.pptx

Main Discussion Points

1. Dr. Kunita, who is JICA expert made a presentation on grain terminal in the world and in Japan.
2. Dr. Kunita made a presentation on the key issues for planning the grain terminal.
3. The reserved area for grain terminal in the short term plan of Nacala Port was reviewed and confirmed as suitable.

3. TF-2: Port Administration and Management

Dispatch	Session No.	Title
4th	8	Meeting for Port Administration and Management (Port EDI system of Japan)
4th	9	Meeting for Process Management Port Administration and Management (Project management)
5th	4	Meeting for Port Administration & Management (Laws and Regulations)
5th	9	Meeting for Port Administration and Management (Privatization of CT)
6th	6	Meeting for Port Administration & Management
6th	10	Meeting for Port Administration & Management
6th	12	Meeting for Port Administration & Management
7th	5	Discussion on the regulation of safety and the regulation of port operations (based on the comments of JICA TA Team)
8th	9	Seminar for safety regulation of Nacala Port
8th	10	Lectures on “5S” and Environmental Management
9th	10	“5S” Training: Guidance
9th	11	“5S” Training: Field Training (1)
9th	12	“5S” Training: Field Training (2)

Session 8 (TF-2)	**Meeting for Port Administration and Management (Port EDI system of Japan)**
4th Dispatch	**Date**: 17th December, 2012 **Time**: 15:30 pm to 17:00 pm **Place**: Conference Room of CDN Nacala

Participants

CFM	Alfredo Mafuca	Manager, Port Operations/Data Handling
	Assane Daudo	Manager, Port Operations/Data Handling
	Ossufo Bacar	Coordinator, Port Operations
	Braulio Catutula	Coordinator, Port Operations
	Lucilia Mangue	Coordinator, Port Operations
	Emanuel Rosse	Floorwalker, Port Operations
	Goncalves Chizuzu	Floorwalker, Port Operations
	Nino Lobo	Floorwalker, Port Operations
CDN	Lucas Cipriano	Director, Port Operations
	Antonio Candido	Director, Maintenance
	Bonifacio Muassabao	Manager, Port Operations
	Eusebio Ananias	Coordinator, Port Operations
	Atumane Quinane	Coordinator, Port Operations
	Gabriel Cossa	Coordinator, Port Operations
JICA Expert Team	Nakashima, Miyaji, Eto, Kimura and Kuribayashi	

Agenda

1. Government to business relation and business to business relation
2. Port procedures of shipping company
3. Port procedures and locations where applications should be submitted
4. Convention on facilitation of international marine traffic
5. The past and future of the single window system of Japan

Materials

1. Port EDI system of Japan

Main Discussion Points

1. Mr. Miyaji made a special presentation on port EDI system of Japan
2. Present condition of port procedures in Nacala port

Session 9 (TF-2)	**Meeting for Process Management** **Port Administration and Management (Project management)**
4th Dispatch	**Date**: 18th December, 2012 **Time**: 14:00 pm to 16:00 pm **Place**: Conference Room of CDN Nacala

Participants

CFM	Alfredo Mafuca	Manager, Port Operations/Data Handling
	Assane Daudo	Manager, Port Operations/Data Handling
	Abubacar Mecuta	Manager, Port Environment
	Feliciano Antonio	Manager, Maintenance/Infrastructures
	Ossufo Bacar	Coordinator, Port Operations
	Braulio Catutula	Coordinator, Port Operations
	Gabriela Cossa	Coordinator, Port Operations
	Draisnildo Monteiro	Supervisor, Port Operations
	Emanuel Rosse	Floorwalker, Port Operations
CDN	Loni Shott	Director, Logistics
	Lucas Cipriano	Director, Port Operations
	Antonio Candido	Director, Maintenance
	Bonifacio Muassabao	Manager, Port Operations
	Atumane Quinane	Coordinator, Port Operations
	Eusebio Ananias	Coordinator, Port Operations
JICA Expert Team	Nakashima, Miyaji, Eto, Kimura and Kuribayashi	

Agenda

1. Process Management
2. Phases of project such as plan, design ,implementation, operation, and management
3. Matters to manage such as quality, time, budget, human resource, information, risk, and environment and social considerations
4. Tools for project management
5. PDCA cycle

Materials

1. Project Management for Port Development

Main Discussion Points

1. Mr. Miyaji made a special presentation on project management for port development
2. Mr. Miyaji made a special presentation of project management including PDCA
3. Mr. Nakashima, who is JICA expert made a closing remarks of workshops at Nacala.

Session 4 (TF-2)	**Meeting for Port Administration & Management (Laws and Regulations)**
5th Dispatch	**Time:** 15:00 to 16:00 **Place:** Conference Room of CDN, Nacala **Date:** 12th April, 2013

Participants

MTC	Ana Matusse Dimande	Project Coordinator
CFM	Braulio Catutula	Coordinator, Port Operations/Data Handling
	Alfredo Artur Mafuca	Manager, Port Operations/Data Handling
	Emanuel Rosse	Floorwalker, Port Operations
	Gonçalves Chizuzu	Floorwalker, Port Operations
CDN	Aderval Acoale Hatos	Port Director
	Antonio F. Candido	
	Candido Frederico	Maintenance Department
PN	Agositnho F. Langa	Operation Director/Executive Committee
	Lucas Cipriano	Port Operations
	Eusebio Ananias	Port Operations
	Atumane Quinane	Port Operations
	Gabriel Joao	Port Operations
	Cremildo Madeira	EHS/Safety
JICA Expert Team	Okada, Nakashima, Kimura, Kawabata, and Kuribayashi	

Agenda

"Regulation of Nacala Port" ; Chapter 7–Occupational Safety

Materials

Kobe Port Container Terminal Safety Policy (English)

Session 9 (TF-2)	**Meeting for Port Administration and Management (Privatization of CT)**
5th Dispatch	**Date:** 15th April, 2013 **Time:** 15:00 to 16:00 **Place:** Conference Room of CDN, Nacala

Participants

CFM	Braulio Catutula	Coordinator, Port Operations/Data Handling
	Alfredo Artur Mafuca	Manager, Port Operations/Data Handling
	Emanuel Rosse	Floorwalker, Port Operations
	Ossufo Bacar	Coordinator,
	Assane Daudo	Manager, Port Operations/Data Handling
CDN	Candido Frederico	Maintenance Department
PN	Agositnho F. Langa	Operation Director/Executive Committee
	Lucas Cipriano	Port Operations
	Neimo Induma	Port Operations
	Luis Machado	Port Operations
	Evaristo Simoco	Law
JICA Expert Team	Okada, Nakashima,	Kimura, Kawabata, and Kuribayashi

Agenda

1. Marketing of the Port
    1) 4Ps for marketing; Product, Price, Place & Promotion
    2) How a shipping line determines an extra port calling

Materials

1. Marketing of the Port
2. Calculation of marginal TEUs required for extra calling at Nacala

Session 6 (TF-2)	**Meeting for Port Administration & Management**
6th Dispatch	**Place**: Conference Room of PN Nacala **Date**: 19th June, 2013 **Time**: 09:00 am to 10:30

Participants

MTC	Ana Matusse Dimande	Project Coordinator
CFM	Paulo Tarmamade	Advisor to the Board of Directors
	Seirgio Simao	Matola Port Manager
	Anabela Matsinha	Civil Engineer
	Balamade Andinane	Technician (Category A)
	Nauaia Mahonca	Technician (Category A)
	Aquital Agy Ibrahimo	Mechanical Engineer
	Arsenio Zimba	Hydraulic Engineer
	Atanasio Neves	Mechanical Engineer
	Miguel Jamisse	Mechanical Engineer
CDN	Aderval Acioli Matos	Port Director
PN	Cremildo Madeira	EHS/Safety
	Gabriel Joao	Chief of Security Division
	Loni Schott Ribeiro	Chief of Commercial Division
	Lucas Cipriano	Port Operation Manager
	Marcio Correia	DASSO
TN	Arlindo Noellete	Advocado
	Carmen Amaral	PortOperations
JICA Expert Team	Nakashima, Eto, Kunita, Komoto, and Kuribayashi	

Agenda

Discussion on the Safety Regulation of Nacala Port

Materials

1. Nacala Port Safety Regulation (PowerPoint slides in English)
2. Draft of Nacala Port Safety Regulation (Word document in Portuguese)

Main Discussion Points

1. Mr. Aderval Matos of CDN made a presentation to summarize the draft of Nacala Port Safety Regulation.
2. Q & A on the contents of draft regulation.
3. Mozambican side requested JICA Expert Team to feed back with comments on the draft by the end of July 2013.

Session 10 (TF-2)	**Meeting for Port Administration & Management**
6th Dispatch	**Place**: Conference Room of PN Nacala **Date**: 20th June, 2013 **Time**: 15:00 am ~ 16:30 am

Participants

CFM	Anabela Matsinha	Civil Engineer
	Aquital Agy Ibrahimo	Mechanical Engineer
	Arsenio Zimba	Hydraulic Engineer
	Atanasio Neves	Mechanical Engineer
	Balamade Andinane	Technician (Category A)
	Miguel Jamisse	Mechanical Engineer
	Sergio Simao	Electronic Engineer (Matola Port Manager)
PN	Cremildo Madeira	EHS/Safety
	Lucas Cipriano	Port Operation Manager
	Neimo Induna	Container Yard Manager
	Luis Jorge Machado	Asst. Port Operation
JICA Expert Team	Nakashima, Kunita, Eto, Komoto, and Kuribayashi	

Agenda

Regulation of Port Operations

Materials

Points to be discussed/clarified (Word document), Chapter 3 of Nacala Port Regulation (Portuguese original), Chapter 3 of Nacala Port Regulation (English version)

Main Discussion Points

1. The contents of Charpter 3 of Nacala Port Regulation were checked article by article.
2. The contents of Article 45 to 74 were confirmed almost as per the original.

Session 12 (TF-2)	**Meeting for Port Administration & Management**
6th Dispatch	**Place**: Conference Room of PN Nacala **Date**: 21st June, 2013 **Time**: 10:30 am ~ 12:00 am

Participants

CFM	Paulo Tarmamade	Adviser to the Board of Directors
	Anabela Matsinha	Civil Engineer
	Balamade Andinane	Technician (Category A)
	Nauaia Mahonca	Technician (Category A)
	Sergio Simao	Electronic Engineer (Matola Port Manager)
	Aquital Agy Ibrahimo	Mechanical Engineer
	Arsenio Zimba	Hydraulic Engineer
	Atanasio Neves	Mechanical Engineer
	Miguel Jamisse	Mechanical Engineer
PN	Agostinho F. Langa Jr	Operation Director/Executive Comittee
	Loni Shott Ribeiro	Chief of Commercial Division
	Lucas Cipriano	Port Operation Manager
	Cremildo Madeira	EHS/Safety
	Luis Jorge Machado	Asst. Port Operation
	Neimo Induna	Container Yard Manager
	Evaristo Joao Simoco	Jurist
JICA Expert Team	Nakashima, Kunita, Eto, Komoto, and Kuribayashi	

Agenda

Regulation of Port Operations

Materials

Points to be discussed/clarified (Word document), Chapter 3 of Nacala Port Regulation (Portuguese original), Chapter 3 of Nacala Port Regulation (English version)

Main Discussion Points

1. The contents of Charpter 3 of Nacala Port Regulation were checked article by article.
2. The contents of Article 75 to 117 were confirmed almost as per the original.
3. Mr. Nakashima commented that :
   1) the difference in the extent of shipping line's liability between conventional cargoes and container cargoes shall be reflected in Chapter 3.
   2) the provisions on the documentation for container cargoes such as EIR shall be added to Chapter 3.

Session 5 (TF-2)	**Discussion on the regulation of safety and the regulation of port operations (based on the comments of JICA TA Team)**
7th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 13th December, 2013 **Time:** 09:30 to 11:30

Participants

CFM North	Abubacar Mecuta	Chief of Security & Safety
CDN	Antonio Frederico Candido	Deputy Port Director
	Ibraimo Mussa	CDN Officer (Port Operation)
	Zacarias Andalusse	CDN Officer (Safety & Security)
	Francisco Davide	CDN Officer (Safety & Security)
PN	Roni Shott	Deputy Port Director
	Lucas Jose Cipriano	Port Operation Director
	Cremildo Eafael Madeira	Environment, Health & Safety
	Gabriel Joao Antonio	Security
	Neimo da Esperanca Indunia	Maintenance/CCOP
	Luis Machado	CCOP
TN	Helvio	Supervisor
	Julio	Supervisor
	Sunil Ratnasiri	Supervisor
	Carmen	Security
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. CDN presented a revised draft of the safety regulation.
2. JICA TA Team suggested further review incorporating specific rules on cargo handling.
3. CDN requested a lecture material on "5S" (Japanese workplace management methodology – Seiri[sort], Seiton[Straighten], Seisou[Shine], Seiketsu[Standardize] and Shitsuke[Sustain]).
4. JICA TA Team suggested that productivity of container handling shall be based on 1) berth productivity, 2) gross productivity per ship gear (gang) and 3) net productivity per ship gear (gang).
5. JICA TA Team reminded that the goal of Nacala port productivity was set at 10 boxes/hour as net productivity per ship gear (gang).

Session 9 (TF-2)	**Seminar for safety regulation of Nacala Port**
8th Dispatch	**Place:** Afrin Nacala Hotel **Date:** 25th April, 2014 **Time:** 10:00 to 11:30

Participants

CFM	Alfredo Artur Mafuca	Operations Manager
	Abubacar Mecuta	Inspection Manager
	Anabela Matsinha	Civil Engineer
	Alfredo Manuel Lipeque	Branch Manager
CDN	Aderval Acioli Matos	Port Director
	Ibraimo Mussa	CDN Officer (Port Operation)
	Zacarias Andaluss	CDN Officer (Safety & Security)
	Francisco Davide	Consultant
PN	Agostinho F. Langa Jr.	Operation Director/Executive Committee
	Lucas Jose Cipriano	Project Management Unit
	Cremildo Rafael Madeira	EHS/Safety
TN	Helvio Salomao	Supervisor
	Denilson Hamide	Director
JICA Expert Team	Okada, Nakashima, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. MTC and JICA Team jointly organized a seminar on the Nacala Port Safety Regulation
2. CDN gave a presentation on the draft regulation formulated in consideration of JICA Team's suggestions
3. PN emphasized its commitment to make Nacala Port a respectable port in the region
4. Participants from port-related agencies/companies actively gave their feedback


Session 10 (TF-2)	**Lectures on "5S" and Environmental Management**
8th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 25th April, 2014 **Time:** 14:30 to 16:30

Participants

CFM	Braulio Catutula	IT Manager
	Anabela Matsinha	Civil Engineer
	Alfredo Manuel Lipeque	Branch Manager
	Alfredo Segola	Maintenance Manager
CDN	Francisco Davide	Consultant
PN	Agostinho F. Langa Jr.	Operation Director/Executive Committee
	Lucas Jose Cipriano	Project Management Unit
	Cremildo Rafael Madeira	EHS/Safety
	Marcio Correia	EHS/Safety
	Abudo Sele	Project Management Unit
	Emmanuel Rassul	EHS/Safety
JICA Expert Team	Okada, Nakashima, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. JICA Team made presentations on "5S" and environmental management systems (EMS)
2. JICA Team encouraged the Mozambican side to try "5S" in the workplace. For smooth implementation, commitment of the top management and identification of benefits for the company and employees are important
3. JICA Team pointed out that EMS targeted to the urgent rehabilitation should be prepared and monitored in cooperation with the contractor/consultant

Session 10 (TF-2)	**"5S" Training: Guidance**
9th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 11th September, 2014 **Time:** 14:30 to 16:30

Participants

MTC	Martinho F. Mafumo	Maritime Administrator
CFM	Braulio Franco Catutula	Port Operation
	Nino Jorge Lobo	Port Operation
	Milione Changala	Supervisor Electrical Engineer
PN	Lucas Jose Cipriano	Project Management Unit
	Luis Jorge Machado	Chief of Port Operation Division
	Cremildo Rafael Madeira	EHS/Safety
	Afonso Vasco da Cunha Jr.	Maintenance Director
	Loni Schott Ribeiro	Chief of the Commercial Division
	Marcio Correia	EHS/Safety
TN	Helvio Salomao	Supervisor
	Carmen Amaral	Security
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. JICA Team made a presentation on a practical application of "5S" (Japanese workplace organization system) in the PN maintenance shop
2. JICA Team gave a detailed explanation on the field training of "5S" scheduled on Sep. 12 aimed to identify unnecessary parts and materials
3. JICA Team suggested that PN should decide the official criteria for red-tagging and yellow-tagging by themselves taking into account the lessons learned in the field training

Session 11/12 (TF-2)	**"5S" Training: Field Training**
9th Dispatch	**Place:** PN Maintenance Shop **Date:** 12th September, 2014 **Time:** 9:30 to 11:30 and 14:30 to 16:30

Participants

Session 11

PN	Jaime Jerafe	Secretary
	Santos Damião	Maintenance Manager
	Loni Schott Ribeiro	Chief of the Commercial Division
	Vitria Matsinhe	HR
	Abudo Hadulale	
TN	Helvio Salomao	Supervisor
	Carmen Amaral	Security
	Denilson Hamide	Director
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Session 12

PN	Luis Jorge Machado	Chief of Port Operation Division
	Afonso Vasco da Cunha Jr.	Maintenance Director
	Luís Alvito Diogo	Maintenance Division
	Santos Damião	Maintenance Manager
	Vitria Matsinhe	HR
	R. P. A. Arunna Shathe	Maintenance
	Lozato Plasselo	Maintenance
TN	Carmen Amaral	Security
JICA Expert Team	Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. JICA Team and Mozambican counterparts jointly carried out field training of "5S" in the PN maintenance shop
2. Red-tagged parts will be listed and the Management will authorize their disposal based on the list

4. TF-3: Cargo Handling

Dispatch	Session No.	Title
4th	2	Cargo Handling: IT technology in CT Business and its Necessity
4th	7	Cargo Handling: Methods of Handling Shipping Data
5th	1	Meeting for Cargo Handling: IT System of CT Operation
6th	3	Meeting for Cargo Handling
6th	9	Meeting for Cargo Handling
6th	11	Meeting for Cargo Handling
7th	3	Discussion on the revision of Phaeros system (upgrading plan by Phaeros engineers)
7th	6	Survey of Nacala 2nd Port (Dry Port)
7th	10	Discussion on productivity of container handling operation including dry port issues (extra session 1)
8th	7	Discussion on the progress of the Phaeros system upgrading
8th	8	Discussion on improvement of dry port and procurement of spreaders with flippers
9th	4	Visit to the dry terminal and TEEN terminal
9th	9	Upgrade status of Phaeros system
10th	3	Site Monitoring (Dry Terminal)
10th	4	Discussion on Data Completion
10th	5	Countermeasure against Strong Wind in the Container Yard

Session 2 (TF-3)	**Cargo Handling: IT technology in CT Business and its Necessity**
4th Dispatch	**Date**: 11th December, 2012 **Time**: 15:00 pm to 16:30 pm **Place**: Conference Room of CDN Nacala

Participants

MTC	Ana Dimande	Project Coordinator
CFM	Gabriel Cossa	Coordinator
	Alfred Mafuca	Manager
	Braulio Catutula	Coordinator
	Draisnildo Monteiro	Floor worker
	Assante Daudo	Manager
	Ossufo Bacar	Coordinator
CDN	Loni shott	Director
	Lucas Ciprriano	Director
	Bonifacio Muassabao	Manager
	Eusebio Amando	Pilot/Manager
	Eusebio Anania	Coordinator
	Atumane Quinane	Coordinator
	Raime Pachinuapa	Manager
	Denilson Hamide	Director
	Nish	Manager
	Helvio Salomao	Coordinator
	Julio	Coordinator
	Sunil Ratnasiri	TN-Stevedoring
JICA Expert Team	Kiyoshi Nakashima	
	Yutaka Miyaji	
	Teruki Eto	
	Susumu Kimura	
	Nobuaki Kuribayashi	Liaison Officer / Operational Coordinator

Agenda

1. Why is a Computerized Container Terminal Management System (CTMS) Necessary?
2. Information and Data Interchanging between CT and the Customers.
3. How the Container data is shown in a System?
4. Information Flow at Modern CT.
5. Conclusion: By introducing a modern computerized system.

Materials

1. Copy set of the presentation material.

Main Discussion Points

1. CTM System providers (makers) in the world and their qualities.
2. Importance of the error-free data and information of CT Operators.

Session 7 (TF-3)	**Cargo Handling: Methods of Handling Shipping Data**
4th Dispatch	**Date**: 17th December, 2012 **Time**: 14:00 pm to 15:30 pm **Place**: Conference Room of CDN Nacala

Participants

MTC	Ana Dimande	Project Coordinator
CFM	Gabriel Cossa	Coordinator
	Alfred Mafuca	Manager
	Braulio Catutula	Coordinator
	Draisnildo Monteiro	Floor worker
	Assante Daudo	Manager
	Ossufo Bacar	Coordinator
CDN	Loni shott	Director
	Lucas Ciprriano	Director
	Bonifacio Muassabao	Manager
	Eusebio Amando	Pilot/Manager
	Eusebio Anania	Coordinator
	Atumane Quinane	Coordinator
	Raime Pachinuapa	Manager
	Denilson Hamide	Director
	Nish	Manager
	Helvio Salomao	Coordinator
	Julio	Coordinator
	Fuanvi Rods	Floor worker
JICA Expert Team	Kiyoshi Nakashima	
	Yutaka Miyaji	
	Teruki Eto	
	Susumu Kimura	
	Nobuaki Kuribayashi	Liaison Officer / Operational Coordinator

Agenda

1. Roles of Modern CTs in the World for Operating CTs Efficiently and Productively.
2. Required Capabilities for Key Persons/Teams to Operate Modern CTs Effectively.
3. Key Functions/Teams to Operate & Manage CTs Efficiently.
4. Recommendable Organization/Teams of Nacala Port CT & Its Roles.
5. Work Flows in between Functions/Teams in Modern CTs to Operate & Manage CTs Efficiently.

Materials

Copy-set of the presentation material.

Main Discussion Points

1. How to introduce systematic CT operation and management in Nacala Port CT.
2. Importance of well-trained experts in various sections of CT, and their cooperative works.

Session 1 (TF-3)	**Meeting for Cargo Handling: IT System of CT Operation**
5th Dispatch	**Date:** 12th April, 2013 **Time:** 09:30 to 11:00 **Place:** Conference Room of CDN Nacala

Participants

CFM	Braulio Catutula	Coordinator, Port Operations/Data Handling
	Alfredo Artur Mafuca	Manager, Port Operations/Data Handling
	Emanuel Rosse	Floorwalker, Port Operations
	Gonçalves Chizuzu	Floorwalker, Port Operations
	Ossufo Bacar	Coordinator, Port Operations/Data Handling
	Jose Muapalame	Coordinator, CFM Pemba
	Assane Daude	Manager, Port Operations/Data Handling, CFM Pemba
	Cesar Antonio	Coordinator, Maintenance/Infrastructure, CFM Pemba
	Ossufo Bacar	CFM Pemba
PN	Agostinho F. Langa	Operation Director/Executive Committee
	Joao Matos Fernandes	Advisor
	Lucas Cipriano	Port Operations
	Neimo Induma	Port Operations
	Bonifacio Muassabão	Port Operations
	Eusebio Ananias	Port Operations
	Luis Machado	Port Operations
	Atumane Quinane	Port Operations
	Gabriel Joao	Security
	Cremildo Madeira	EHS / Safety
CDN	Aderval Acioli Matos	Port Director
	Abubacar Meanto	Manager, Port Operations
JICA Expert Team	Okada, Nakashima, Kimura, Kawabata and Kuribayashi	

Agenda

1. Merits of the introduction of TOS (CTMS)
2. System Configuration
   - Yard Plan Computer System (YPCS)
   - Yard Planning System (YP)
   - Vessel Planning System (VP)
   - Job Control (JC)
   - Yard Operation System (YO)
   - Radio Handheld Terminal (RHT)
   - Integrated Gate System (IGS)
   - Web System (WEB)
3. In case of Nacala Container Terminal

Session 3 (TF-3)	**Meeting for Cargo Handling**
6th Dispatch	**Place**: Conference Room of PN Nacala **Date**: 18th June 2013 **Time**: 9:00 am ~ 10:30 am

Participants

CFM	Balamade Andinane	Technician (Category A)
	Nauaia Mahonca	Technician (Category A)
	Paulo Tarmamade	Adviser of the Board of Directors
	Sergio Simao	Electronic Engineer (Matola Port Manager)
	Aquital Agy Ibrahimo	Mechanical Engineer
	Arsenio Zimba	Hydraulic Engineer
	Atanasio Neves	Mechanical Engineer
	Miguel Jamisse	Mechanical Engineer
PN	Agostinho F. Langa Jr.	Operation Director/Executive Committee
	Leonel do Rodorigues	IT Technician
	Neimo Induna	Container Yard Manager
	Lucas Cipriano	Port Operation Manager
	Luis Jorge Machado	Asst. Port Operation
	Eusebio Ananias Ramos	Coordinator, Port Operations
JICA Expert Team	Nakashima, Kunita, Eto, Komoto, and Kuribayashi	

Agenda

Restructuring of Phaeros, a Terminal Operating System (TOS)

Materials

1. Restructuring Plan prepared by PN for Improving their existing TOS, Phaeros.
2. Possible Operational Data Flows by a TOS at Nacala Port CT as an example/reminder.

Main Discussion Points

1. Mr. Eto, a JICA expert, started the discussion by presenting “Possible data flow in various operation phases at Nacala Port CT” through some figures.
2. Mr. Eto, also, emphasized that Phaeros (TOS) is just a tool, not a solution; accordingly, operation staff in PN must master basic technologies and skills (know-how) on CT Operation to run the CT properly.
3. Mr. Eto and other JICA experts confirmed re-engineering/up-grading schedule of Phaeros through Mr.Eusebio and other attendees.

Session 9 (TF-3)	**Meeting for Cargo Handling**
6th Dispatch	**Place**: Conference Room of PN Nacala **Date**: 20th June, 2013 **Time**: 10:30 am ~ 12:00 am

Participants

CFM	Balamade Andinane	Technician (Category A)
	Nauaia Mahonca	Technician (Category A)
	Paulo Tarmamade	Adviser of the Board of Directors
	Sergio Simao	Electronic Engineer (Matola Port Manager)
	Anabela Matsinha	Civil Engineer
	Aquital Agy Ibrahimo	Mechanical Engineer
	Atanasio Neves	Mechanical Engineer
	Miguel Jamisse	Mechanical Engineer
PN	Neimo Induna	Container Yard Manager
	Lucas Cipriano	Port Operation Manager
	Luis Jorge Machado	Asst. Port Operation
	Eusebio Ananias Ramos	Coordinator, Port Operations
	Bonifacio Muassabao	Port Operations
	Atumane Quinane	Port Operations
	F. Ribeiro	Port Coordinator
CDN	Aderval Acioli Matos	Port Director
TN	Abdui Cadre	Supervisor
JICA Expert Team	Eto, Nakashima, Kunita, Komoto, and Kuribayashi	

Agenda

How to manage Container Yard Operations given current conditions.

(The agenda was changed because Nacala CT (CY) was facing a very critical condition at the time, namely, that a lot of long-dwelling import laden containers were being piled in the CY.)

Materials

Power Point Material: Urgent Necessity on Nacala Port Container Yard (CY) Management

Main Discussion Points

1. Capt. Eto, a JICA expert, started the discussion emphasizing that Nacala Port CY would continue to face problems unless management took the necessary actions immediately.
2. The reason for the difficult situation is that there are more than 3,500 TEU of containers in total in the CY, while it's sustainable Max CY Capacity is 2,520 TEU (stacking containers at 3 highs overall).
3. Mr. Eto, accordingly, made various suggestions to PN for easing the conditions such as;
   1) Secure spaces outside of the Port (Off Dock CY) and move all the available empty containers.
   2) Also, move import laden containers as well after receiving permission from Customs.
4. Mr. Langa, Operation Director of PN, explained that PN has been contacting with Customs since 2-3 months ago but has received no answer from Customs yet.
5. In conclusion, PN and JICA Team confirmed that Mr. Langa will continue his efforts to obtain permission from Customs as soon as possible.

Session 11 (TF-3)	**Meeting for Cargo Handling**
6th Dispatch	**Place**: Conference Room of PN Nacala **Date**: 21st June, 2013 **Time**: 9:00 am ~ 10:30 am

Participants

CFM	Balamade Andinane	Technician (Category A)
	Nauaia Mahonca	Technician (Category A)
	Paulo Tarmamade	Adviser of the Board of Directors
	Sergio Simao	Electronic Engineer (Matola Port Manager)
	Anabela Matsinha	Civil Engineer
	Aquital Agy Ibrahimo	Mechanical Engineer
	Arsenio Zimba	Hydraulic Engineer
	Atanasio Neves	Mechanical Engineer
	Miguel Jamisse	Mechanical Engineer
PN	Agostinho F. Langa Jr	Operation Director/Executive Comittee
	Lucas Cipriano	Port Operation Manager
	Eusebio Ananias Ramos	Coordinator, Port Operations
	Bonifacio Muassabao	Port Operations
JICA Expert Team	Nakashima, Kunita, Eto, Komoto and Kuribayashi	

Agenda

Necessity of the use of "Spreader with Flippers”

Materials

Power Point Material: Why it’s better to Use “Spreaders with Flippers” at Ship-gear Ops

Main Discussion Points

1. Capt. Eto, a JICA expert, began by discussing the efforts of PN in attaching flippers on their existing spreaders in just several months by themselves.
2. However, spreaders as well as flippers were made by soft irons; thus, the flippers were all bent and broken.
3. PN, then, had intended to purchase some spreaders, but “without” flippers.
4. However, Mr. Eto told PN that they cannot increase a ship’s operational productivity with such spreaders without flippers because of the nature of “ships gear” operation.
5. PN understood the importance of using spreaders with flippers, and agreed to purchase a sufficient number of spreaders with flippers.

Session 3 (TF-3)	**Discussion on the revision of Phaeros system (upgrading plan by Phaeros engineers)**
7th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 12th December, 2013 **Time:** 09:30 to 11:30

Participants

CFM North	Braulio Catutula	Operations Officer
	Abubacar Mecuta	Chief of Security & Safety
PN	Matos Fernandes	General Director/Adviser
	Lucas Jose Cipriano	Port Operation Director
	Neimo da Esperanca Indunia	Maintenance/CCOP
	Luis Machado	CCOP
	Eusebio Ananias	Port Operation Division (DOP)
	Leonel Rodorigues	IT Section
	Bruno Perreira	IT Section
TN	Denilson Hamide	Director
	Helvio	Supervisor
	Noroda	TN Officer
	Sunil Ratnasiri	Supervisor
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. PN presented the Phaeros system upgrade program and its timeline which will become operational in March 2014.
2. Detailed configuration of the system is still under review and introduction of EDI is also under discussion.
3. JICA TA Team provided the typical system requirement in flow charts for import and export containers.

Session 6 (TF-3)	**Survey of Nacala 2nd Port (Dry Port)**
7th Dispatch	**Place:** Nacala 2nd Port (Dry Port) **Date:** 16th December, 2013 **Time:** 14:30 to 16:30

Participants

PN	Lucas Jose Cipriano	Port Operation Director
TN	Denilson Hamide	Director
JICA Expert Team JICA Mozambique	Okada, Eto, Kimura and Komoto Kuribayashi	

Agenda

1. The dry port currently handles empty container only.
2. The dry port can reduce the congestion of the container yard inside the port if it handles laden import containers.
3. The following actions are necessary to improve the situation
   - Yard pavement to have enough bearing capacity to handle laden containers with reach stackers
   - Redesigning the yard arrangement to maximize the capacity
   - Consideration of the bonded area

Session 10 (TF-3)	**Discussion on productivity of container handling operation including dry port issues (extra session 1)**
7th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 17th December, 2013 **Time:** 09:30 to 11:30

Participants

CDN	Ibraimo Mussa	Port Operation
PN	Lucas Jose Cipriano	Port Operation Director
	Neimo da Esperanca Indunia	Maintenance/CCOP
TN	Denilson Hamide	Director
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. JICA TA Team provided a modified yard design of the dry terminal aimed to handle containers at a level comparable to the global standard.
2. JICA Team transferred practical knowhow of the efficient and safe use of container yards such as
   - Collection and sorting of ships' data by shipping lines and service loops needed to prepare efficient stacking / marshalling plans
   - Assignment of 3 documentation clerks and 3 ship planners to provide effective yard operations

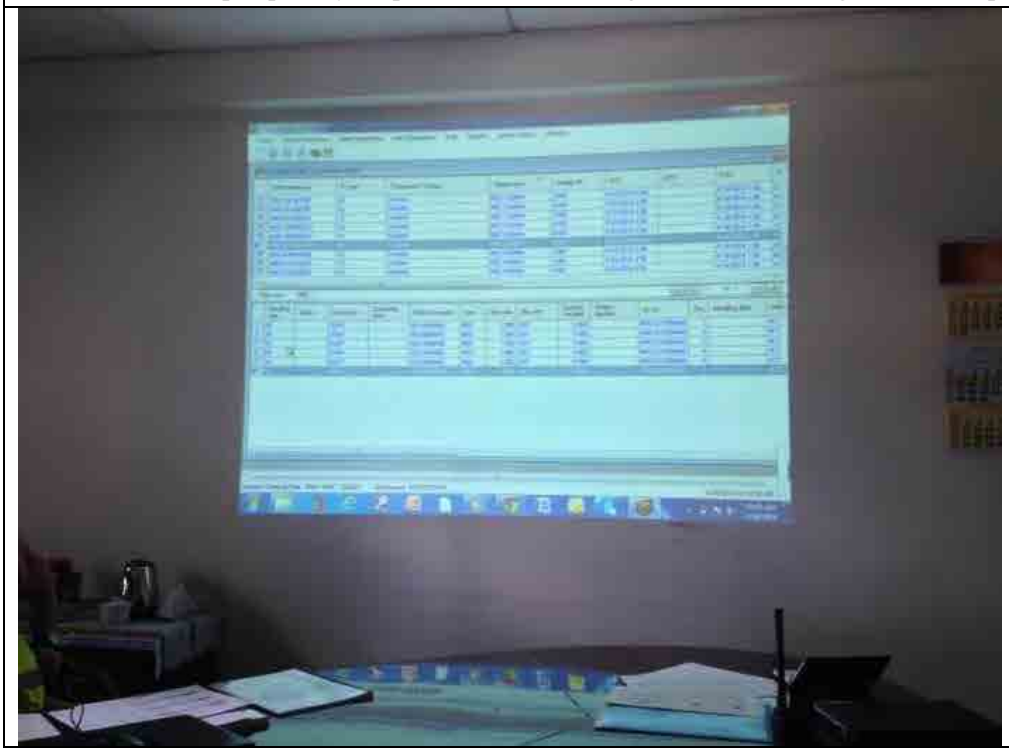
Session 7 (TF-3)	**Discussion on the progress of the Phaeros system upgrading**
8th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 24th April, 2014 **Time:** 09:30 to 11:30

Participants

CFM	Anabela Matsinha	Civil Engineer
	Nino Lobo	Fire Brigade Manager
PN	Agostinho F. Langa Jr.	Operation Director/Executive Committee
	Neimo da Esperanca Induna	Maintenance/CCOP
	Eusebio Ananias Ramos	Port Operation Division (DOP)
	Luis Jorge Machado	Chief of Port Operation Division
	Leonel do Rodorigues	IT Technician
JICA Expert Team	Okada, Nakashima, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. PN presented the upgraded Phaeros system consisting of several modules including vessel operation, gate operation, yard operation, and tally operation. In future, communication among operators will be done with iPads through wifi
2. The new system is now in a trial in cooperation with two shipping agents and would become fully operational in May.
3. Since this system does not include automatic yard planning functions, JICA Team suggested that PN should develop capable yard planners either through overseas training or onsite expert assistance



Session 8 (TF-3)	**Discussion on improvement of dry port and procurement of spreaders with flippers**
8th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 24th April, 2014 **Time:** 14:30 to 16:30

Participants

CFM	Anabela Matsinha	Civil Engineer
PN	Agostinho F. Langa Jr.	Operation Director/Executive Committee
	Lucas Jose Cipriano	Project Management Unit
	Luis Jorge Machado	Chief of Port Operation Division
TN	Denilson Hamide	Director
	Sunil Ratnasiri	Supervisor
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. TN started to upgrade the dry terminal by paving the yard and installing lighting poles. The upgraded terminal will start operation in September 2014
2. Through talks with customs, it was agreed to remove import containers staying in the port terminal for more than 25 days and move them to the TEEN terminal
3. TN has placed an order of four spreaders with flippers to a South African firm
4. JICA Team suggested that Nacala port should keep track of container handling productivity by three universally applied indicators

Session 4 (TF-3)	**Visit to the dry terminal and TEEN terminal**
9th Dispatch	**Place:** Dry Terminal and TEEN Terminal **Date:** 5th September, 2014 **Time:** 14:30 to 16:30

Participants

MTC	Martinho F. Mafumo	Maritime Administrator
CFM	Alfredo Artur Mafuca	Oil Terminal Manager
CDN	Ibraimo Mussa	Port Operations Analyst
PN	Lucas Jose Cipriano	Project Management Unit
TN	Jose Samu	Operation
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

JICA Team and Mozambican counterparts visited the dry terminal and TEEN terminal

1. At the dry terminal:
   - Surface leveling and compaction have been completed
   - Lighting poles are under construction
   - Two reach stackers will be introduced in November
   - JICA team asked for the final layout plan
2. At the TEEN terminal:
   - Designed for export containers inspection but used for import containers on an ad-hoc basis when the need arises
   - Annual capacity of 100,000 TEUs with 552 ground slots

Session 9 (TF-3)	**Upgrade status of Phaeros system**
9th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 11th September, 2014 **Time:** 9:30 to 11:30

Participants

MTC	Martinho F. Mafumo	Maritime Administrator
CFM	Braulio Franco Catutula	Port Operation
	Milione Changala	Supervisor Electrical Engineer
PN	Lucas Jose Cipriano	Project Management Unit
	Neimo da Esperanca Induna	Maintenance/CCOP
	Eusebio Ananias Ramos	Port Operation Division (DOP)
	Luis Jorge Machado	Chief of Port Operation Division
	Loni Schott Ribeiro	Chief of the Commercial Division
	Leonel Caetano	IT
TN	Sunil Ratnasiri	Supervisor
	Denilson Hamide	Director
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

- JICA Team presented IT system requirements for a modern container terminal
- PN demonstrated the current operations and functions of Phaeros (getting fully operational in September)
- JICA Team and Mozambican counterparts jointly identified what functions are lacking in the current Phaeros system (PN-TN data link, yard planning, vessel planning)
- JICA Team confirmed the progress of the dry terminal upgrading and procurement of spreaders (arriving in September)
- JICA Team presented ways for PN to acquire world-standard operational skills and thereby generate sufficient revenue
- JICA Team emphasized the need of capacity development for ship planners and yard planners

Session 3 (TF-3)	**Site Monitoring (Dry Terminal)**
10th Dispatch	**Place:** PN's dry terminal, Nacala **Date:** 2nd February, 2015 **Time:** 09:30 to 11:00

Participants

CFM North (Nacala)	Nino Jorge Lobo	Port Operation
PN	Luis Machado	Chief of Port Operations Division
	Abudo Sele	Project Management Unit
TN	Denilson Hamide	Branch Mnager
	Jose Samo	RH, Administration
	Castro Juma	Operation Manager
	Julio Quinhane	Port Operations
	Jaime Pedro	
JICA Expert Team	Okada (Team Leader), Eto, Kimura, Nakashima	
JICA Mozambique	Kuribayashi	

Agenda

To identify the current status of the dry terminal

Observation

1. The ground condition of dry terminal has become rough due to the flood happened in early January.
2. The ground needs to be paved when the rainy season ends in April, 2015 to improve durability of the surface against the stacking of empty containers as well as laden containers.

Photo

Session 4 (TF-3)	**Discussion on Data Compilation**
10th Dispatch	**Place:** Conference Room of PN, Nacala **Date:** 2nd February, 2015 **Time:** 14:00 to 16:00

Participants

CFM (Office of Nacala Port Rehabilitation Project)	Arzilio Josué Mata	Supervisor/Civil Engineer
	Tomás Fortunato Ngca	Supervisor/Mechanical Engineer
	Milione Changala	Supervisor/Electrical Engineer
	José Osias Cherinda	Supervisor/H.S.T.
CFM (DEPE)	Carmona Macobola	Civil Engineer
PN	Loni Schott Ribeiro	Chief of Commercial Division
	Luis Machado	Chief of Port Operations Division
	António Gabriel	Chief of Security Division
	Abudo Sele	Project Management Unit
	Neimo Induna	CCOP
	Eusebio Ananias	Port Operation
TN	Denilson Hamide	Branch Mnager
	Sunil Ratnasiri	Operation Assistant
	Niroda	Operation Assistant
JICA Expert Team	Okada (Team Leader), Eto, Kimura, Nakashima	
JICA Mozambique	Kuribayashi	

Agenda

1. CY capacity management through reduction of container dwell time
2. PN's presentation on the current status and issues of CY operations

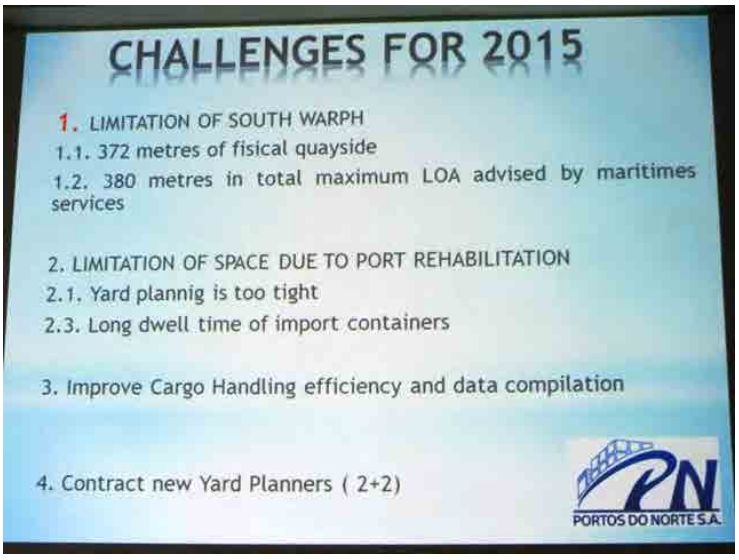
Materials

3. "Key Points on Operation & Management of Nacala Port CT at Present & in the Near Future" (JICA Team)
4. "Cargo Handling" (PN)

Discussions

5. JICA Team presented how to manage CY capacity in a sustainable condition.
   - JICA Team recommended that the container dwell time needs to be measured regularly and reduced to secure more CY capacity
   - Also recommended that an appropriate area of off-dock CYs need to be prepared so that over-flow containers can be accommodated.
   - JICA Team provided a soft copy of Excel sheet to PN so that they can calculate CY capacity.
6. PN presented on the current status of CY operations.
   - In 2014, the Port achieved the largest handling volume ever in both of containers & bulk despite the rehabilitation works of Grant Aid Project.
   - Phaeros is now used online by all shipping lines.
   - Segregation of export containers is now in practice.
   - Vehicle turn-around time has reduced.
   - WiFi will be installed to cover entire CY area by mid-March, followed by RDTs to be equipped.
   - 4 yard planners are considered to be employed.

Photo


CHALLENGES FOR 2015
1. LIMITATION OF SOUTH WARPH
1.1. 372 metres of fisical quayside
1.2. 380 metres in total maximum LOA advised by maritimes services
2. LIMITATION OF SPACE DUE TO PORT REHABILITATION
2.1. Yard plannig is too tight
2.3. Long dwell time of import containers
3. Improve Cargo Handling efficiency and data compilation
4. Contract new Yard Planners (2+2)
PN
PORTOS DO NORTE S.A.

Session 5 (TF-3)	**Countermeasures Against Strong Wind in the Container Yard**
10th Dispatch	**Place:** Conference Room of PN, Nacala **Date:** 4th February, 2015 **Time:** 09:30 to 11:00

Participants

CFM (Office of Nacala Port Rehabilitation Project)	Tomás Fortunato Ngca	Supervisor/Mechanical Engineer
	Milione Changala	Supervisor/Electrical Engineer
	José Osias Cherinda	Supervisor/H.S.T.
CFM (DEPE)	Carmona Macobola	Civil Engineer
CFM North (Nacala)	Alfredo Rafael Sigola	Chief of Infrastructure Dept.
	Alfredo Artur Mafuca	Oil Terminal Manager
	Abubacar Mecuta	Port Security
CDN	Ibraimo Mussa	Port Operations Analyst
	Zacaries Andaluse	Safety Consultant
PN	Agostinho F. Langa Jr.	Director/COO
	Loni Schott Ribeiro	Chief of Commercial Division
	Luis Machado	Chief of Port Operations Division
	Vasco Cunha	Chief of Maintenance Division
	Abudo Sele	Project Management Unit
	Neimo Induna	CCOP
	Cremildo Márcio	DASSO
TN	Denilson Hamide	Branch Mnager
	Helvio Salomao	Operation Manager
	Carmen Amaral	Safety Officer
	Jaime Pedro	
JICA Expert Team	Okada (Team Leader), Eto, Kimura, Nakashima	
JICA Mozambique	Kuribayashi	

Agenda

1. To make a suggestion on the countermeasures against high wind in the container yard
2. To give a numerical base for the decision making related to strong wind

Materials

1. “Countermeasures against Strong Wind in the Container Yard”
2. “Study of Turn-over of Containers”

Discussions

1. JICA Team recommended Mozambican side to establish a special committee responsible for measures to be taken against strong wind.
2. JICA Team made a suggestion how to operate cargo handling equipment and how to stack empty and laden containers in CY in time of strong wind.
3. Also recommended Mozambican side to install anemometers to keep track of wind conditions and follow weather forecasts.
4. Any measures established in the above need to be reflected in the Safety Regulations.

Photo

5. TF-4: Maintenance of Cargo Handling Equipment

Dispatch	Session No.	Title
4th	1	Meeting for Maintenance of CHE
4th	6	Meeting for Maintenance of CHE
5th	5	Meeting for Maintenance of Cargo Handling Equipment: Action Plan on the Improvement of Handling Equipment
5th	10	Training session of Maintenance of Cargo Handling Equipment: Spare Part List for Periodically Replaced Parts and Emergency Parts
7th	8	Discussion on equipment maintenance
8th	5	Joint site monitoring of the equipment
8th	6	Discussion on Equipment Maintenance
9th	7	Equipment maintenance (1)
9th	8-2	Equipment maintenance (2)
10th	2	Site Monitoring (Maintenance Shop, Infrastructure)

Session 1 (TF-4)	**Meeting for Maintenance of CHE**
4th Dispatch	**Date:** 11th December, 2012 **Time:** 14:00 pm to 15:00 pm **Place:** Conference Room of CDN Nacala

Participants

MTC	Ana Dimande	Project Coodinator, Derectorate of Infrastucture
CFM	Gabriel Cossa	Coordinator, Port Operators
	Alfredo Mafuca	Manager, Port Operations/Data Handling
	Braulio Catutula	Coordinator, Port Operations/Data Handling
	Draisnildo Monteio	Floorwalker, Port Operations
CDN	Loni Shot	Director, Logistics
	Lucas Cipriano	Director, Port Operations
	Bonifacio Muassabao	Manager, Port Operations
	Eusebio Amando	Pilot/Manager, Port Operations
	Eusebio Anania	Coordinator, Port Operations
	Atumane Quinane	Coordinator, Port Operations
	Raime Pachinuapa	Manager, TN-Stevedoring Co.
	Denilson Hamide	Director, TN-Stevedoring Co.
	Nishi	Manager, TN-Stevedoring Co.
	Helvio Salomao	Coordinator, TN-Stevedoring Co.
	Julio	Coordinator, TN-Stevedoring Co.
	Suuil Ratuasiri	General Manager, TN-Stevedoring Co.
JICA Expert Team	Kiyoshi Nakashima	
	Yutaka Miyaji	
	Teruki Eto	
	Susumu Kimura	
	Nobuaki Kuribayashi	Liaison Officer / Operational Coordinator

Agenda

1. Explanation of Improvement of Procurement of Parts
   - Current Procurement Flow
   - Review on Procurement of Parts
   - Improvement of Procurement of Parts
2. Explanation of Improvement of Inventory Management
   - List of Stock Parts

Materials

1. PPT of " Improvement of Procurement of Parts and Inventory Management"
2. Procurement Part List (attached in PPT above)
3. List of Stock Parts (Example of RTG) (attached in PPT above)

Main Discussion Points

1. Mr. Kimura, who is JICA expert, made a special presentation on "Improvement of Procurement of Parts & Inventory Management".
2. Existing problems found: Example 1 and 2 – These 2 problems were found during the last visit to Nacala Port
3. The comparison between present procurement method and "Data Base method by Personal computers"

4. The merit in case of adoption of format of Procurement Part List and List of Stock Parts as a first step of Digitization of procurement data by Personal computers

Session 6 (TF-4)	**Meeting for Maintenance of CHE**
4th Dispatch	**Date**: 17th December, 2012 **Time**: 14:00 pm to 15:30 pm **Place**: Conference Room of CDN Nacala

Participants

CFM	Abubacar Mecuta	Manager, Port Environment
	Feliciano Antonio	Manager, Maintenance/Infrastucture
	Draisnildo Monteio	Floorwalker, Port Operations
	Cesar Antonio	Coordinator, Maintenance/Infrastucture
	Jose Muapalame	Coordinator, Maintenance/Infrastucture
CDN	Antonio Candido	Director, Maintenance
	Afonso Vasco	Manager, Maintenance/Infrastucture
	Cremildo Madeira	Manager, EHS
JICA Expert Team	Kiyoshi Nakashima	
	Yutaka Miyaji	
	Teruki Eto	
	Susumu Kimura	
	Nobuaki Kuribayashi	Liaison Officer / Operational Coordinator

Agenda

1. Planning and Management of Lubrication of the Container Handling Equipment
   - Importance of Lubrication (Lubricant Manner, etc.)
   - Guide Drawing of Lubrication Points Lubrication Period (Frequency) and Lube and Lubricant List
   - Guide Drawing of Lubrication Points < Example of Guide Drawing using photos >
   - The Next Actions to be carried out by the end of March
2. Periodical Inspections and Maintenance Management of Container Handling Equipment
   - Purpose and Importance of Periodical Inspections
   - Division of roles between the Owner and User
   - Periodical Inspections and Records
   - Flow of Maintenance Management
   - Maintenance management of Container Handling Equipment

Materials

1. PPT of " Improvement of Procurement of Parts and Inventory Management"
2. PPT of " Periodical Inspections and Maintenance Management of Container Handling Equipment"
3. Examples of Guide Drawing of Lubrication Points Lubrication Period (Frequency) and Lube and Lubricant List
4. Format of Records of Inspection and Measures (Example: Refer to the Figure 1.)

Main Discussion Points

1. Mr. Kimura, who is JICA expert, made a special presentation on "Planning and Management of Lubrication of the Container Handling Equipment".
   - Necessity of Guide Drawing of Lubrication, Points Lubrication Period (Frequency) and Lube and Lubricant List
   - The Next Actions to be carried out by the end of March

2. Mr. Kimura made a special presentation on “Periodical Inspections and Maintenance Management of Container Handling Equipment”.
   - Purpose and Importance of Periodical Inspections and Division of roles between the Owner and User
   - Items of Periodical Inspections and Records

Session 5 (TF-4)	**Meeting for Maintenance of Cargo Handling Equipment: Action Plan on the Improvement of Handling Equipment**
5th Dispatch	**Date:** 12th April, 2013 **Time:** 15:00 to 17:00 **Place:** Conference Room of Warehouse No. 03 0f Nacala Port

Participants

CFM	Tomás Kumwanga	Engineer
	Rafael Sigola	Engineer
PN	Afonso Vasco da Cunha	Director of the Maintenance Division Technical Bureau
	Luís Alvito Diogo	Secretary
	Jaime Jerafe	Chief of the Vehicle Maintenance Department
	Santos Damião Lubato Masseco	Supervisor of the Electrical Machinery Section
JICA Expert Team	Susumu Kimura	

Agenda

1. Explanation of "Action Plan on the Improvement of Handling Equipment
2. Examples of Spare Part List

Session 10 (TF-4)	**Training session of Maintenance of Cargo Handling Equipment: Spare Part List for Periodically Replaced Parts and Emergency Parts**
5th Dispatch	**Date:** 15th April, 2013 **Time:** 15:00 to 17:00 **Place:** Conference Room of Warehouse No. 03 0f Nacala Port

Participants

CFM	Tomás Kumwanga	Engineer
	Rafael Sigola	Engineer
PN	Jose Muapalame	Coordinator, Maintenance/Infrastructure
	Afonso Vasco da Cunha	Director of the Maintenance Division
	Luís Alvito Diogo	Technical Bureau
	Santos Damião	Chief of the Vehicle Maintenance Department
	Lubato Masseco	Supervisor of the Electrical Machinery Section
JICA Expert Team	Susumu Kimura	

Agenda

1. List of Parts Periodically Replaced for (2) Year Operation
2. List of Emergency Parts to prevent stoppage of Operation

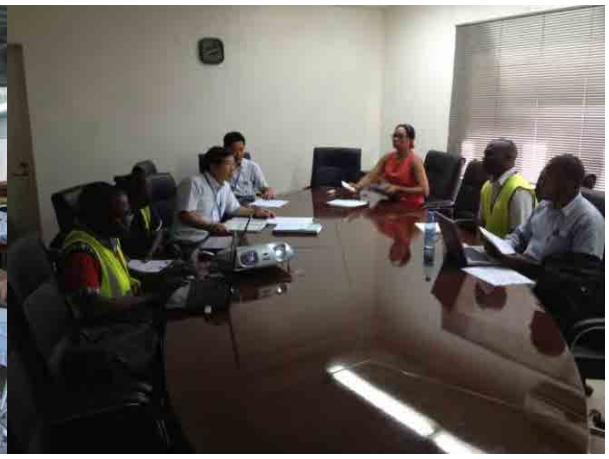
Session 8 (TF-4)	**Discussion on equipment maintenance**
7th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 16th December, 2013 **Time:** 14:30 to 16:30

Participants

CFM	Paulo Tarmamade	Advisor of the Board of Directors
	Abubacar Mecuta	Chief of Security & Safety
CDN	Ibraimo Mussa	Port Operation
PN	Roni Shott	Deputy Port Director
	Lucas Jose Cipriano	Port Operation Director
	Afonso Vasco da Cunha	Maintenance Director
	Neimo da Esperanca Indunia	Maintenance/CCOP
	Luis A. Diogo	Maintenance
	Wilmida C. Juma	Maintenance
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. JICA Team and PN carried out a joint inspection of equipment.
2. PN has presented a preventive maintenance plan, daily equipment checklist, equipment availability records, organization chart and annual maintenance budget.
3. Average equipment availability ratio has improved significantly due to the following reasons;
   - Introduction of new equipment (2 new reach stackers)
   - Streamlining of spare parts procurement



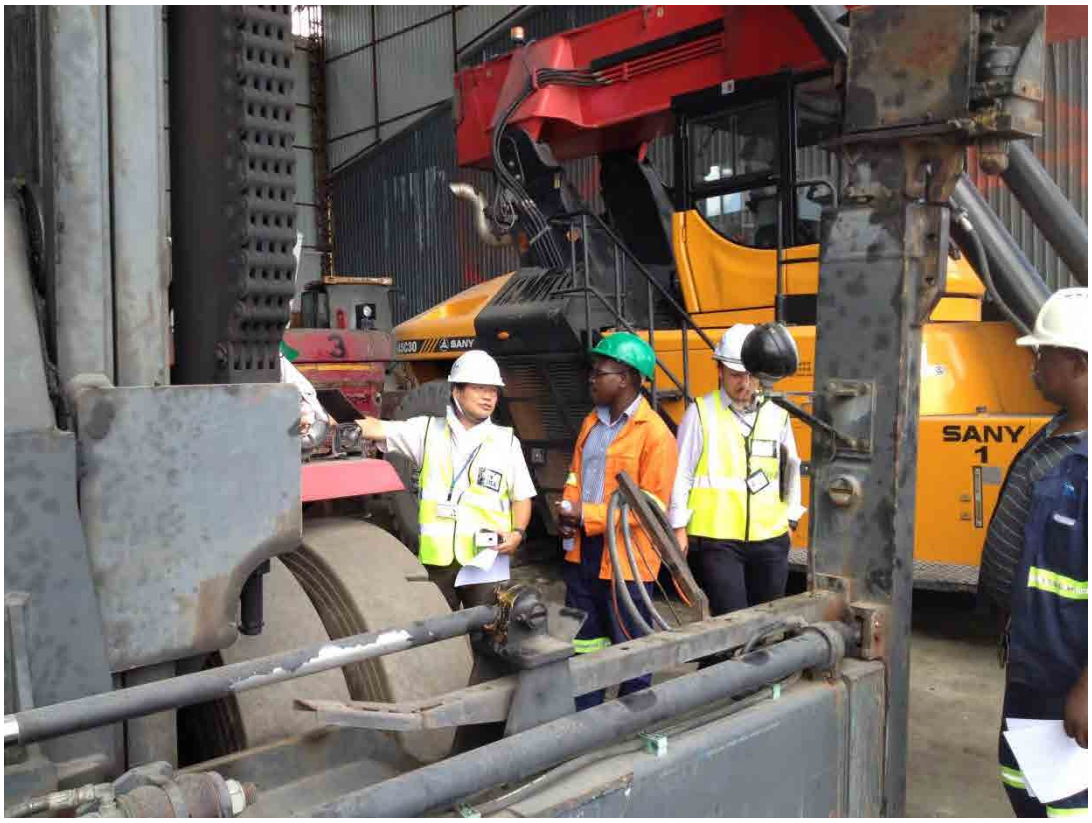
Session 5 (TF-4)	**Joint site monitoring of the equipment**
8th Dispatch	**Place:** Maintenance Workshop **Date:** 23rd April, 2014 **Time:** 09:30 to 11:30

Participants

CFM	Abubacar Mecuta	Inspection Manager
	Alfredo Segola	Maintenance Manager
	Anabela Matsinha	Civil Engineer
CDN	Ibraimo Mussa	CDN Officer (Port Operation)
PN	Lucas Jose Cipriano	Project Management Unit
	Santos Damião	Maintenance Manager
	Luís Alvito Diogo	Maintenance Division
	Wilmida C. Juma	Maintenance
	Abudo Sele	Project Management Unit
JICA Expert Team	Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. JICA Team and Mozambican counterparts carried out a joint site monitoring of the equipment
2. It was found that the delivery of some parts were delayed resulting in prolonged downtime of equipment



Session 6 (TF-4)	**Discussion on Equipment Maintenance**
8th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 23rd April, 2014 **Time:** 14:30 to 16:30

Participants

CFM	Braulio Catutula	IT Manager
	Draisnildo Luis Monteiro	Civil Technician A
	Abubacar Mecuta	Inspection Manager
	Anabela Matsinha	Civil Engineer
	Alfredo Segola	Maintenance Manager
TN	Lucas Jose Cipriano	Project Management Unit
	Luís Alvito Diogo	Maintenance Division
	Wilmida C. Juma	Maintenance
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. PN presented the maintenance record of equipment. Equipment is generally kept in a good condition but some equipment remains out of order due to the delay in the delivery of spare parts
2. JICA Team gave two presentations suggesting major points to be noted and examined by the operation department and maintenance department before the delivery of two RTGs
3. Aiming to reduce the equipment downtime, JICA Team suggested:
   - Periodically replaced parts should be stored in the workshop
   - Comprehensive maintenance service contract with a reliable supplier could be an answer
   - PN Nacala could be authorized for minor expenditure of maintenance procurement

Session 7 (TF-4)	**Equipment maintenance (1)**
9th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 10th September, 2014 **Time:** 9:30 to 11:30

Participants

MTC	Martinho F. Mafumo	Maritime Administrator
CDN	Ibraimo Mussa	Port Operations Analyst
PN	Lucas Jose Cipriano	Project Management Unit
	Afonso Vasco da Cunha Jr.	Maintenance Director
	Luís Alvito Diogo	Maintenance Division
	Loni Schott Ribeiro	Chief of the Commercial Division
TN	Helvio Salomao	Supervisor
	Denilson Hamide	Director
	Johny Verter	Technician
JICA Expert Team	Okada, Eto and Kimura	
JICA Mozambique	Kuribayashi	

Agenda

- PN presented the recent records of the working conditions of cargo handling equipment
- Availability of equipment has increased to as high as 80 % resulting from the implementation of periodical maintenance
- JICA Team suggested that detailed information on each equipment (such as accumulated operation hours, downtime, date of the placement of spare parts orders) should be shared by the management
- JICA Team also suggested that the Mozambican side should decide who is responsible for the maintenance of equipment introduced in ODA projects and get ready for its maintenance.

Session 8-2 (TF-4)	**Equipment maintenance (2)**
9th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 10th September, 2014 **Time:** 14:30 to 16:30

Participants

MTC	Martinho F. Mafumo	Maritime Administrator
CFM	Milione Changala	Supervisor Electrical Engineer
CDN	Ibraimo Mussa	Port Operations Analyst
PN	Lucas Jose Cipriano	Project Management Unit
PN	Afonso Vasco da Cunha Jr.	Maintenance Director
PN	Luís Alvito Diogo	Maintenance Division
PN	Santos Damião	Maintenance Manager
PN	Lubato Masseco	Supervisor of the Electrical Machinery Section
PN	Antonio Sitdra	Maintenance
PN	Johnny Venker	TECON:SE
JICA Expert Team	Eto and Kimura	
JICA Mozambique	Kuribayashi	

Agenda

- JICA Team presented components of RTG and its periodical inspection procedures
- JICA Team suggested that monthly maintenance of 2 RTGs should be carried out in 5 hours by 5 mechanics
- Additional lectures will be given in the next dispatch

Session 2 (TF-4)	**Site Monitoring (Maintenance Shop, Infrastructure)**
10th Dispatch	**Place:** Nacala Port, maintenance shop, North Wharf and South Wharf **Date:** 30th January, 2015 **Time:** 14:00 to 15:30

Participants

CFM (Office of Nacala Port Rehabilitation Project)	Arzilio Josué Mata	Supervisor/Civil Engineer
	Tomás Fortunato Ngca	Supervisor/Mechanical Engineer
	Milione Changala	Supervisor/Electrical Engineer
	José Osias Cherinda	Supervisor/H.S.T.
CFM North (Nacala)	Alfredo Rafael Sigola	Chief of Infrastructure Dept.
	Drasnildo Luis Monteiro	Chief of Infrastructure Dept.
	Braulio Franco Catutula	Port Operation
	Nino Jorge Lobo	Port Operation
PN	Vasco Cunha	Chief of Maintenance Division
	Abudo Sele	Project Management Unit
JICA Expert Team	Okada (Team Leader), Kimura, Nakashima	
JICA Mozambique	Kuribayashi	

Observations

1. Maintenance shop
   (ア) Debris used be found in the reach stacker maintenance house have already been taken away and the house seems to be kept in good order.
   (イ) The items red-tagged in the 9th dispatch were still found at the warehouses. Those items are supposed to be removed after the new warehouse is built.
   (ウ) 2 units of Ferrari reach stackers provided by the Grand Aid Project have already been in operation. PN staffs commended for their quicker responses than those of the existing reach stackers.
2. North Wharf
   (ア) Construction works of the Grant Aid Project seems to be performed in good order, while 1 month delay is reported due to Christmas vacation and the rough weather in early January, 2015.
   (イ) No accident has been reported at the construction sites until now.
3. South Wharf
   (ア) The survey of the deteriorated places was conducted by CFM/PN once in November, 2014. The next survey is scheduled in March, 2015 after the rainy season is over.
   (イ) A simple repair work is under consideration after the Grant Aid Project is completed.

Photo

6. TF-5: Infrastructure Maintenance

Dispatch	Session No.	Title
5th	2	Meeting of Maintenance of Port Facilities: Preventive Maintenance / Maintenance Management
5th	7	Meeting for Maintenance of Port Facilities: Preventive Maintenance / Maintenance Management
6th	4	Meeting of Maintenance of Port Facilities
6th	8	Meeting for Maintenance of Port Facilities
6th	13	Meeting for Maintenance of Port Facilities
7th	2	Discussion on the maintenance plan of infrastructures (based on the result of survey by Geoibericos)
7th	4	Survey of infrastructures with Mozambican counterpart
7th	7	Discussion on the result of infrastructure monitoring carried out by Mozambican counterpart
7th	11	Monitoring of infrastructures (extra session 2)
8th	2	Discussion on the maintenance plan of infrastructures
8th	3	Joint site monitoring of the infrastructure
8th	4	Discussion on South Wharf Countermeasures
9th	5	Infrastructure maintenance (1): Infrastructure Monitoring & Basics of Level Survey
9th	6	Infrastructure maintenance (2): Joint Inspection
9th	8-1	Infrastructure maintenance (3): Field Training of Level Survey

Session 2 (TF-5)	**Meeting of Maintenance of Port Facilities: Preventive Maintenance / Maintenance Management**
5th Dispatch	**Date:** 12th April, 2013 **Time:** 11:00 to 12:00 **Place:** Conference Room of CDN Nacala

Participants

CFM	Assane Daudo	Manager, Port Operations
	Draisnildo Luis Monteiro	Floorwalker, Port Operations
	Tomas Kumwanga	Engineer
	Rafael Sigola	Engineer
	Abubacar Mecuta	Manager, Port Environment
	Cesar Antonio	Coordinator, Maintenance/Infrastructure
CDN	Aderval Acioli Matos	Port Director
PN	Lucas Cipriano	Port Operations
	Neimo Induma	Port Operations
	Eusebio Ananias	Port Operations
	Luis Machado	Port Operations
	Atumane Quinane	Port Operations
TN	Helvio Salomao	Port Operations
	Julio Quinhane	Port Operations
JICA Expert Team	Okada, Nakashima, Kimura, Kawabata and Kuribayashi	

Agenda

1. Review of the recommendation made in September, 2012
2. Explanation of Objectives of Maintenance Planning
3. Concept of Maintenance Plan
4. Flow of preparation of the maintenance plan for existing facilities
5. Preparation of the documented maintenance plan
6. (Homework)
   Maintenance Action Plan to be prepared by CDN/PN by June, 2013
   CDN/PN to organize/assign necessary manpower

Session 7 (TF-5)	**Meeting for Maintenance of Port Facilities: Preventive Maintenance / Maintenance Management**
5th Dispatch	**Date:** 13th April, 2013 **Time:** 10:00 to 11:00 **Place:** Conference Room of CFM Nacala

Participants

CFM	Jose Muapalame	Coordinator, CFM Pemba
	Assane Daude	Manager, Port Operations, CFM Pemba
	Cesar Antonio	Coordinator, Maintenance / Infrastructure, CFM Pemba
	Ossufo Bacar	CFM Pemba
JICA Expert Team	Okada, Nakashima, Kimura, Kawabata and Kuribayashi	

Agenda

1. Review of the F/S report descriptions for Pemba port
2. Explanation of Objectives of Maintenance Planning
3. Discussions for Issues of Pemba port as of today
4. (Recommendations)

   Rubber fenders shall be installed as Nacala port did.

   To organize/assign necessary manpower

   Seek JICA experts' advices for technical transfer to the employees of CFM Pemba

Session 4 (TF-5)	**Meeting of Maintenance of Port Facilities**
6th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 18th June, 2013 **Time:** 10:30 to 12:00

Participants

MTC	Ana Matusse Dimande	Project Coordinator
CFM	Aquital Agy Ibrahimo	Mechanical Engineer
	Arsenio Zimba	Hydraulic Engineer
	Atanasio Neves	Mechanical Engineer
	Sergio Simao	Matola Port Manager
	Paulo Tarmamade	Advisor of the Board of Directors
	Balamade Andiane	Technician (Category A)
	Nauaia Mahonca	Technician (Category A)
PN	Agostinho F. Langa Jr.	Operation Director/Executive Committee
	Afonso Vasco da Cunha Jr.	Chief of the Maintenance Division
	Neimo Indunia	Container Yard Manager
JICA Expert Team	Nakashima, Kunita, Eto, Komoto and Kuribayashi	

Agenda

Preventive Maintenance / Maintenance Management

Main discussion points

1. Review of "Issues on the South Wharf of Nacala Port – 17 Apr, 2013"
2. Explanation of actions taken by C/P on the issues
3. Explanation of current condition of the South Wharf
4. Discussions for the Issues and future measures
5. (Recommendations)

   Monitoring program shall be established and enforced

   Minimize laden container placement on both wharf deck and yard just behind

   C/P requested to continue the discussion on how to prolong the life of the South Wharf

Session 8 (TF-5)	**Meeting for Maintenance of Port Facilities**
6th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 20th June, 2013 **Time:** 9:00 to 10:30

Participants

CFM	Anabela Matsinha	Civil Engineer
	Aquital Agy Ibrahimo	Mechanical Engineer
	Arsenio Zimba	Hydraulic Engineer
	Atanasio Neves	Mechanical Engineer
	Sergio Simao	Matola Port Manager
	Paulo Tarmamade	Advisor to the Board of Directors
	Balamade Andiane	Technician (Category A)
	Nauaia Mahonca	Technician (Category A)
PN	Agostinho F. Langa Jr.	Operation Director / Executive Committee
	Afonso Vasco da Cunha Jr.	Chief of the Maintenance Division
	Neimo Indunia	Container Yard Manager
JICA Expert Team	Nakashima, Kunita, Eto, Komoto and Kuribayashi	

Agenda

Preventive Maintenance / Maintenance Management

Main discussion points

1. Discussion on the progress of the facility maintenance action plan
2. Explanation of CP's plan to employ an investigation company to do facility mapping, producing maintenance plan etc.
3. Explanation of current condition of the South Wharf based on the result of joint inspection on 19 June
4. (Recommendations)
   Monitoring program shall be established and enforced
   Obtain the result of monitoring to present TA team on the next visit for further discussion

Session 13 (TF-5)	**Meeting for Maintenance of Port Facilities**
6th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 24th June, 2013 **Time:** 14:00 to 15:30

Participants

CFM	Anabela Matsinha	Civil Engineer
	Arsenio Zimba	Hydraulic Engineer
PN	Agostinho F. Langa Jr.	Operation Director / Executive Committee
	Afonso Vasco da Cunha Jr.	Chief of the Maintenance Division
	Neimo Indunia	Container Yard Manager
JICA Expert Team	Nakashima, Kunita, Eto, Komoto and Kuribayashi	

Agenda

Preventive Maintenance / Maintenance Management

Materials

Monitoring of Civil Infrastructure,

Main Discussion Points

1. Brief explanation of every wharf Structures at Nacala Port
2. What shall be inspected/monitored
3. Method of inspection/monitoring
4. Handover of measuring equipment (Rebound hammer, Measuring Tape etc.)
5. (Recommendations)
   Inspection/monitoring shall be started as soon as possible (equipment handed over)
   Present the result of inspection/monitoring to TA team on the next visit for further discussion

Session 2 (TF-5)	**Discussion on the maintenance plan of infrastructures (based on the result of survey by Geoibericos)**
7th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 11th December, 2013 **Time:** 14:30 to 16:30

Participants

CFM North	Braulio Catutula	Operations Officer
	Abubacar Mecuta	Chief of Security & Safety
CDN	Ibraimo Mussa	Port Operation
PN	Joao Matos Fernandes	General Director/Advisor
	Loni Shott	Deputy Port Director
	Lucas Jose Cipriano	Port Operation Director
	Afonso Vasco da Cunha	Maintenance Director
	Neimo da Esperanca Indunia	Maintenance/CCOP
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Ohno and Kuribayashi	

Agenda

1. PN presented the outcome of Geoibericos studies carried out in Jul~Aug 2013.
   The results of investigation show the similar findings as JICA's on deterioration of Southfindings.
   PN will carry out routine maintenance of infrastructures while implementation of pile rehabilitation is required within 2 years according to the study.
2. JICA TA Team presented the latest Nacala Port Development schedule and explained that the South Wharf must be maintained operational until the new North Container berth becomes available.
3. Since the reports have been just issued in Portuguese, JICA TA Team and C/P will study the reports and will discuss in detail during the next dispatch.

Session 4 (TF-5)	**Survey of infrastructures with Mozambican counterpart**
7th Dispatch	**Place:** South Wharf and North Wharf **Date:** 12th December, 2013 **Time:** 14:30 to 16:30

Participants

CFM North	Braulio Catutula	Operations Officer
CDN	Antonio Frederico Candido	Deputy Port Director
PN	Lucas Jose Cipriano Neimo da Esperanca Indunia	Port Operation Director Maintenance/CCOP
JICA Expert Team	Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. JICA TA Team and counterpart jointly inspected current condition of South and North Wharf.
2. JICA TA Team pointed out CY adjacent to the South Wharf seems settled compare with the last dispatch as well as deterioration of the concrete structure generally progressing.
3. Corrupted concrete pavement adjacent to the South Wharf discovered in the last dispatch has been repaired by PN. Photos taken during the repair work were given to JICA TA Team after the inspection.
4. Counterpart explained that the soil underneath the pavement seems seeping out due to the wave and tidal water flow based on their observation from underneath the deck slab.
5. Laden containers in the yard adjacent to the South Wharf have been removed following JICA Team suggestion.

Session 7 (TF-5)	**Discussion on the result of infrastructure monitoring carried out by Mozambican counterpart**
7th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 16th December, 2013 **Time:** 09:30 to 11:30

Participants

CFM	Paulo Tarmamade	Advisor of the Board of Directors
	Alfredo Manuel Lipego	
CDN	Ibraimo Mussa	Port Operation
PN	Roni Shott	Deputy Port Director
	Lucas Jose Cipriano	Port Operation Director
	Afonso Vasco da Cunha	Maintenance Director
	Neimo da Esperanca Indunia	Maintenance/CCOP
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. Discussion on the joint inspection result showing progressing deterioration.
2. JICA TA Team will examine the monitoring plan produced by Geoibericos.
3. PN will soon employ a competent civil engineer in charge of monitoring and maintenance.
4. JICA TA Team will consider providing survey equipment for doing monitoring by counterpart.

Session 11 (TF-5)	**Monitoring of infrastructures (extra session 2)**
7th Dispatch	**Place:** CFM Maputo **Date:** 18th December, 2013 **Time:** 09:30 to 11:30

Participants

CFM	Paulo Tarmamade	Advisor of the Board of Directors
	Anabela Matsinha	Civil Engineer
	Arcelio Lopes Bainha	Civil Engineer
JICA Expert Team	Okada, Eto, Kimura and Komoto	

Agenda

1. CFM presented their report of the site inspection of North/South Wharves carried out on 5th and 6th Dec identifying ongoing degradation.
2. CFM will review the Geoibericos report to decide what to do.
3. JICA TA Team will inform a list of survey equipment needed for quantitative monitoring of the degradation.
4. CFM requested capacity building on the use of survey equipment procured by CFM and/or JICA TA Team.

Session 2 (TF-5)	**Discussion on the maintenance plan of infrastructures**
8th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 21st April, 2014 **Time:** 14:30 to 16:30

Participants

CFM	Paulo Tarmamade	Adviser of the Board of Directors
	Alfredo Manuel Lipeque	Branch Manager
	Braulio Catutula	IT Manager
	Abubacar Mecuta	Inspection Manager
	Alfredo Segola	Maintenance Manager
	Anabela Matsinha	Civil Engineer
CDN	Francisco Davide	Consultant
PN	Loni Shott	Deputy Port Director
	Lucas Jose Cipriano	Project Management Unit
	Afonso Vasco da Cunha	Maintenance Director
	Abudo Sele	Project Management Unit
	Luís Alvito Diogo	Maintenance Division
JICA Expert Team	Okada, Nakashima, Kimura and Komoto	
JICA Mozambique	Ohno and Kuribayashi	

Agenda

1. JICA Team asked about the progress of the infrastructure maintenance (inspection, monitoring, repair)
2. The Mozambican side responded:
   - The concessionaire (CDN) will remain responsible for the infrastructure maintenance after the concession contract is revised
   - PN has just assigned a civil engineer for infrastructure maintenance
3. JICA Team pointed out:
   - Infrastructure maintenance needs to be started immediately taking into account the Geoibericos report

Session 3 (TF-5)	**Joint site monitoring of the infrastructure**
8th Dispatch	**Place:** Nacala Port South Wharf and North Wharf **Date:** 22nd April, 2014 **Time:** 09:30 to 11:30

Participants

CFM	Alfredo Segola	Maintenance Manager
	Abubacar Mecuta	Inspection Manager
	Anabela Matsinha	Civil Engineer
PN	Lucas Jose Cipriano	Project Management Unit
	Abudo Sele	Project Management Unit
JICA Expert Team	Okada, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

4. JICA Team demonstrated how the elevation of structures would be monitored with survey equipment to be provided later on
5. Mozambican counterparts will have completed preparatory field works before the delivery of the equipment
6. JICA Team demonstrated how to measure the concrete strength with a rebound hammer and a crack scale
7. Mozambican counterparts will start monitoring the state of infrastructure

Session 4 (TF-5)	**Discussion on South Wharf Countermeasures**
8th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 22nd April, 2014 **Time:** 14:30 to 16:30

Participants

MTC	Ana Matusse Dimande	Project Coordinator
CFM	Paulo Tarmamade	Adviser of the Board of Directors
	Alfredo Manuel Lipeque	Branch Manager
	Alfredo Segola	Maintenance Manager
	Braulio Catutula	IT Manager
	Abubacar Mecuta	Inspection Manager
	Anabela Matsinha	Civil Engineer
PN	Lucas Jose Cipriano	Project Management Unit
	Neimo da Esperanca Indunia	Maintenance/CCOP
	Abudo Sele	Project Management Unit
JICA Expert Team	Okada, Nakashima, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

1. JICA Team presented:
   - Necessary steps to be taken before the Mozambican side decides countermeasures
   - Measures to analyze the residual strength of concrete and steel structures
   - Alternative reinforce measures
   - Viewpoints in the comparison of new construction and rehabilitation
   - Points to be noted during the implementation
2. CFM and CDN will consider what to do with the South Wharf taking account of JICA Team's view

Session 5 (TF-5)	**Infrastructure maintenance (1): Infrastructure Monitoring & Basics of Level Survey**
9th Dispatch	**Place:** Conference Room of PN Nacala **Date:** 9th September, 2014 **Time:** 9:30 to 11:30

Participants

MTC	Martinho F. Mafumo	Maritime Administrator
CFM	Anabela Matsinha	Supervisor Civil Engineer
	Arzilio Mata	Supervisor Civil Engineer
	Floclordo Cumbane	Port Operation
	Ohairo Mario	Port Security
PN	Lucas Jose Cipriano	Project Management Unit
	Afonso Vasco da Cunha Jr.	Maintenance Director
	Abudo Sele	Project Management Unit
JICA Expert Team	Okada, Eto, Kimura and Komoto	
JICA Mozambique	Kuribayashi	

Agenda

- PN presented its results on concrete cracks and strength inspection of the South Wharf
- In response, JICA Team suggested periodical inspection at the fixed location
- JICA Team presented basics of level survey and settlement monitoring

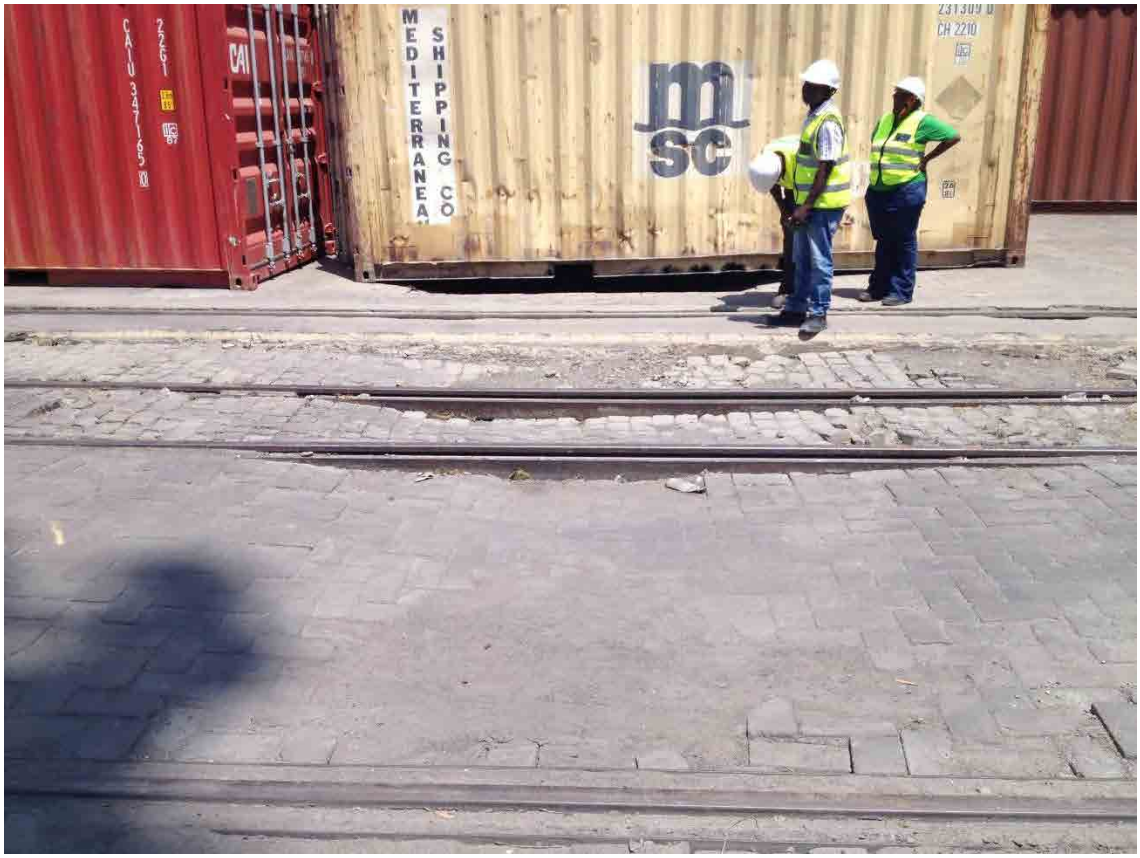
Session 6 (TF-5)	**Infrastructure maintenance (2): Joint Inspection**
9th Dispatch	**Place:** South Wharf and North Wharf **Date and Time:** 14:30 to 16:30 9th September, 2014 and 9:30 to 11:30 10th September, 2014

Participants

CFM	Abubacar Mecuta	Port Security
CFM	Anabela Matsinha	Supervisor Civil Engineer
CFM	Arzilio Mata	Supervisor Civil Engineer
PN	Afonso Vasco da Cunha Jr.	Maintenance Director
PN	Abudo Sele	Project Management Unit
JICA Expert Team	Komoto	
JICA Mozambique	Kuribayashi	

Agenda

- JICA Team and Mozambican counterparts jointly carried out infrastructure inspection
- Inspection of the South Wharf using a small boat was postponed to Sep. 10 due to the high tide
- It was found that most of the preparation works had been carried as requested in the previous dispatch
- Serious deterioration of the South Wharf was confirmed by joint inspection on Sep. 10
- It was also found that rock scouring protection behind the rear wall was partially lost at many locations resulting in a leak of filled soil



Session 8-1 (TF-5)	**Infrastructure maintenance (3): Field Training of Level Survey**
9th Dispatch	**Place:** South Wharf **Date:** 10th September, 2014 **Time:** 14:30 to 16:30

Participants

CFM	Anabela Matsinha	Supervisor Civil Engineer
PN	Neimo da Esperanca Induna	Maintenance/CCOP
PN	Abudo Sele	Project Management Unit
JICA Expert Team	Okada and Komoto	

Agenda

- JICA Team and Mozambican counterparts jointly carried out a field training program on leveling survey
- During the field training, practical methods of leveling survey works were demonstrated by JICA Team and experienced by Mozambican counterparts
- JICA Team provided counterparts with further suggestions so that they would be able to carry out precise surveys on their own

Appendix-4:　ナカラ港セミナー議事録(2015 年 2 月 5 日)

Seminar on Nacala Port

10th Dispatch

Place: Conference Center of Afrin Nacala Hotel, Nacala
Date: 5th February, 2015
Time: 09:30 to 12:00, followed by luncheon

Participants

Customs Office in Nacala	Domingos Magaia	Representative
Migration Office in Nacala	Renato Manuel Furruma	Chief Officer
INAHINA	Emilia Miranda Abuchir	Officer
GAZEDA	Carlos Muchigera	Marketing Sector
Conselho Municipal da Cidade de Nacala Port	Chakil Aboobacar	Advisor to the President
Kudumba Investments	Stelio Rodorigues	General Director
Manica Freight Services	Ibraimo Assumane	Branch Manager
CMA-CGM	Hinelder Ferreira	Branch Manager
MSC	Simon Kanjanga	Branch Manager
Maersk Line	Carolyn Kathewera	Branch Manager
MTC (moderator)	Martinho F. Mafumo	Maritime Administrator
CFM (Maputo)	Anibal Manave	Advisor to the Board
CFM (Office of Nacala Port	Arzilio Josué Mata	Supervisor/Civil Engineer
Rehabilitation Project)	Anabela Emilia Matsinha	Supervisor/Civil Engineer
	Tomás Fortunato Ngca	Supervisor/Mechanical Engineer
	Milione Changala	Supervisor/Electrical Engineer
	José Osias Cherinda	Supervisor/H.S.T.
CFM (DEPE)	Carmona Macobola	Civil Engineer
CFM North (Nacala)	Alfredo Manuel Lipeque	CFM Nacala Director
	Alfredo Artur Mafuca	Oil Terminal Manager
	Nino Jorge Lobo	Port Operation
	Abubacar Mecuta	Port Security
CDN	Fabio Frazão	Port Director
	Ibraimo Mussa	Port Operations Analyst
PN	Agostinho F. Langa Jr.	Director/COO
	Loni Schott Ribeiro	Chief of Commercial Division
	Luis Machado	Chief of Port Operations Division
	Vasco Cunha	Chief of Maintenance Division
	Abudo Sele	Project Management Unit
	Neimo Induna	CCOP
	Luis Diogo	Maintenance
TN	Denilson Hamide	Branch Mnager
	Helvio Salomao	Operation Manager
	Carmen Amaral	Safety Officer
	Jaime Pedro	
JICA Mozambique	Akiko Shimohira, Nobuaki Kuribayashi	
JICA Expert Team	Mitsuhiko Okada (Team Leader), Teruki Eto, Susumu Kimura, Kiyoshi Nakashima	

Program.

1. JICA technical assistance for Nacala Port – achievement and future challenges
   (by Mr. Mitsuhiko Okada, Leader of JICA Team)
2. Improvement in infrastructure and equipment
   (by Mr. Arzilio Josué Mata, Supervisor/Civil Engineer, CFM

3. Strengthening of port functions at Nacala, the gateway of Nacala Corridor
   (by Mr. Ibraimo Mussa, Operation Analyst, CDN))
4. Improvement in terminal operation
   (by Mr. Neimo Induna, CCOP, PN)
5. Expectations for future development of Nacala Port
   (by Mr. Hinelder Ferreira, Branch Manager, CMA CGM Mozambique
   and Mr. Simon Kanjanga, Branch Manager, MSC Mozambique)

Materials

- Seminar Program
- The Project for Improvement of Nacala Port – Major Achievements, Roles a Good Port can Play (JICA Team)

Discussions

1. JICA Team, Mozambican side and port users made presentations as per the program above.
2. In Q&A afterwards, CDN and PN explained to the audience that the port's capacity and operational efficiency will be enhanced once the renovation works of the Grant Aid and Yen Loan Projects are all completed, and asked for their cooperation until then.

Photo

Appendix-5: 港湾統計資料

表 1　ナカラ港での事故数の推移

Type of accident	2011	2012	2013
Damages to cargoes/properties	5	4	22
Human fatal/injury accidents	8	7	15
Total	13	11	37

Source: CDN, PN (monthly/yearly reports)

表 2　ナカラ港の労務者数

Company	Department	Nos of employees
PN	Port Operations	55
	Maintenance	69
	S. Total	124
TN	Stevedoring	575
	Packing	197
	Machine operators	151
	Dry port workers	13
	S. Total	936
Total		1,060

Notes:
i. Number of PN workers based on previous CDN's head-count as of Dec. 31, 2011.
ii. Number of TN workers as of Jul.15, 2014
iii. Clerical workers are excluded

Source: CDN, TN

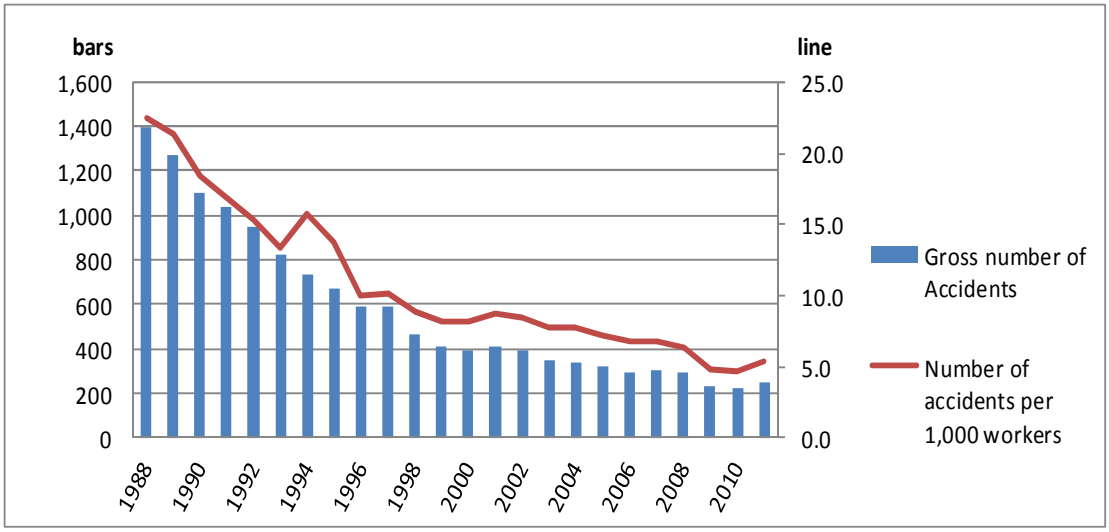


図 1　日本の港湾での重大災害／事故数の推移

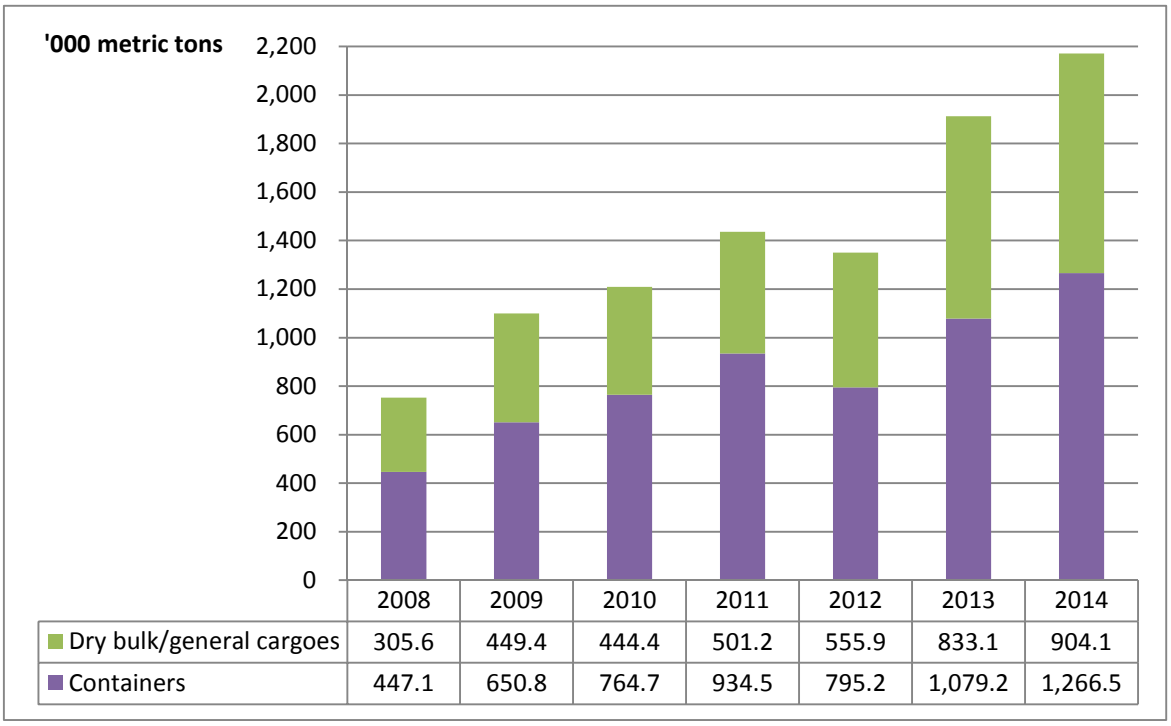
Source: Japan Port Transport Industry Safety & Health Association

表 3　ナカラ港の取扱貨物量の推移
(CFM による液体バルクを除く)

('000 metric tons)

Trade			Commodity	2008	2009	2010	2011	2012	2013	2014
International	Export	Local	Iron Ore							28.5
			Maize	8.9	3.6		29.0			
			Scrap	13.8	5.0	8.0	11.3			
			Machinery						0.5	0.9
			Woods	2.8						
			Others					0.1	6.2	0.1
			Bulk S.total	25.5	8.6	8.0	40.3	0.1	6.7	29.5
			Containers	42.1	225.4	327.8	305.8	294.1	405.2	520.3
			S.total	70.4	234.0	335.8	346.1	294.2	411.9	549.8
		Transit	Scrap				8.3			
			Sugar	28.3	15.7	8.2	6.1	23.2	14.8	25.2
			Bulk S.total	28.3	15.7	8.2	14.4	23.2	14.8	25.2
			Containers	44.6	49.8	40.7	74.4	32.1	65.9	74.8
			S.total	72.9	65.5	48.9	88.8	55.3	80.7	100.0
		Export total		143.3	299.5	384.7	434.9	349.5	492.6	649.8
	Import	Local	Clinker	133.6	134.3	158.5	182.5	153.1	202.7	206.0
			Palm oil	26.5	38.9	49.8	66.9			
			Wheat	54.0	89.7	63.0	59.1	63.2	49.2	128.9
			Machinery			0.8	6.3	10.1	15.3	12.8
			Vehicles						2.6	0.4
			Rails						37.4	50.5
			Crossties						18.3	22.8
			Plaster/gypsum			2.4	5.5	17.0		25.1
			Cement	3.6	53.8	4.6	5.0	75.5	247.8	250.1
			Rice			9.8	4.2	25.1	16.6	12.2
			Vegetable oil				2.0			
			Frozen fish			1.7	1.2	2.1	2.2	1.5
			Others		7.6	1.9	0.7	11.9	27.3	32.2
			Bulk S.total	217.7	324.3	292.5	333.4	358.0	619.4	742.5
			Containers	165.5	201.5	229.5	364.4	396.1	529.3	588.3
			S.total	383.2	525.8	522.0	697.8	754.1	1,148.7	1,330.8
		Transit	Wheat		49.9	97.5	68.4	164.6	163.9	92.6
			Fertilizer	30.0	43.4	36.9	14.3	10.0	11.0	13.6
			Vegetable oil	2.9	7.2		5.2			
			Bulk S.total	32.9	100.5	134.4	87.9	174.6	174.9	106.2
			Containers	76.6	90.7	38.2	38.5	30.0	35.8	44.8
			S.total	109.5	191.2	172.6	126.4	204.6	210.7	151.0
		Import total		492.7	717.0	694.6	824.2	958.7	1,359.4	1,481.8
	Tranship		Wheat				25.0			
			Woods						2.9	0.4
			Bulk S.total	0.0	0.0	0.0	25.0	0.0	2.9	0.4
			Containers	80.2	56.4	99.8	115.9	29.9	20.2	9.2
			S.total	80.2	56.4	99.8	140.9	29.9	23.1	9.6
	Restow		Containers				23.2	10.0	10.9	25.8
	International Total			716.2	1,072.9	1,179.1	1,423.2	1,348.1	1,886.0	2,167.0
Coastal	Loading		Cement						2.8	
			Machinery						0.1	
			Others	0.4			0.2		1.5	
			Bulk S.total	0.4	0.0	0.0	0.2	0.0	4.4	0.0
			Containers	8.8	8.3	7.3	4.4	0.2	1.3	1.0
			S.total	9.2	8.3	7.3	4.6	0.2	5.7	1.0
	Discharging		Cement						10.0	
			Others	0.8	0.3	1.3				0.3
			Bulk S.total	0.8	0.3	1.3	0.0	0.0	10.0	0.3
			Containers	29.3	18.7	21.4	7.9	2.8	10.6	2.3
			S.total	30.1	19.0	22.7	7.9	2.8	20.6	2.6
	Coastal Total			39.3	27.3	30.0	12.5	3.0	26.3	3.6
G.total				755.5	1,100.2	1,209.1	1,435.7	1,351.1	1,912.3	2,170.6

Source: CDN, PN (arranged by the Project Team)



	2008	2009	2010	2011	2012	2013	2014
Dry bulk/general cargoes	305.6	449.4	444.4	501.2	555.9	833.1	904.1
Containers	447.1	650.8	764.7	934.5	795.2	1,079.2	1,266.5

図 2　ナカラ港の取扱貨物量の推移
(CFM による液体バルクを除く)

Source: CDN, PN (arranged by the Project Team)

表 4　ナカラ港のコンテナ取扱量の推移

(TEUs)

			2008	2009	2010	2011	2012	2013	2014
International	Export	Local	18,758	17,381	26,669	33,253	28,107	35,840	42,511
		Transit	3,246	3,368	2,558	4,303	1,739	2,768	4,123
		S.total	22,004	20,749	29,227	37,556	29,846	38,608	46,634
	Import	Local	18,138	20,881	25,748	37,424	30,160	38,950	45,297
		Transit	2,962	2,810	2,373	1,937	1,744	1,791	2,259
		S.total	21,100	23,691	28,121	39,361	31,904	40,741	47,556
	Transhipment		2,879	3,824	8,114	10,149	2,084	1,490	519
	Rehandling		0	0	0	0	1,004	1,317	1,953
	Total		45,983	48,264	65,462	87,066	64,838	82,156	96,662
Coastal	Loading		1,501	2,133	2,899	1,516	123	210	229
	Discharging		2,286	2,223	2,978	1,132	202	442	190
	Total		3,787	4,356	5,877	2,648	325	652	419
G.total			49,770	52,620	71,339	89,714	65,163	82,808	97,081

Source: CDN, PN (arranged by the Project Team)

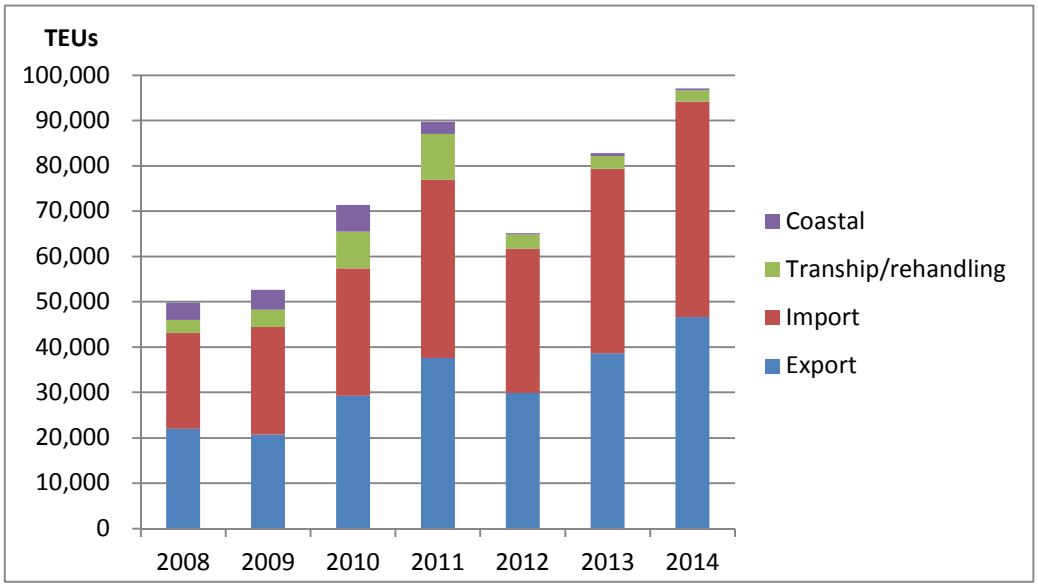


図 3　ナカラ港のコンテナ貨物量の推移

Source: CDN, PN (arranged by the Project Team)

表 5　ナカラ港の寄港船舶数の推移

		2011	2012	2013	2014
International	Container vessels	155	156	183	173
	Tankers	52	49	47	53
	Dry bulk vessels	23	21	38	32
	G/C & others	28	53	165	70
	S. Total	258	279	433	328
Coastal	Tankers	26	27	21	30
	Container vessels			8	
	G/C & others			9	6
	S. Total	26	27	38	36
Non -commercial	Utility ships		46	8	1
	Fishing boats	3	6		
	S. Total	3	52	8	1
Total		287	358	479	365

Source: CDN, PN (arranged by the Project Team)

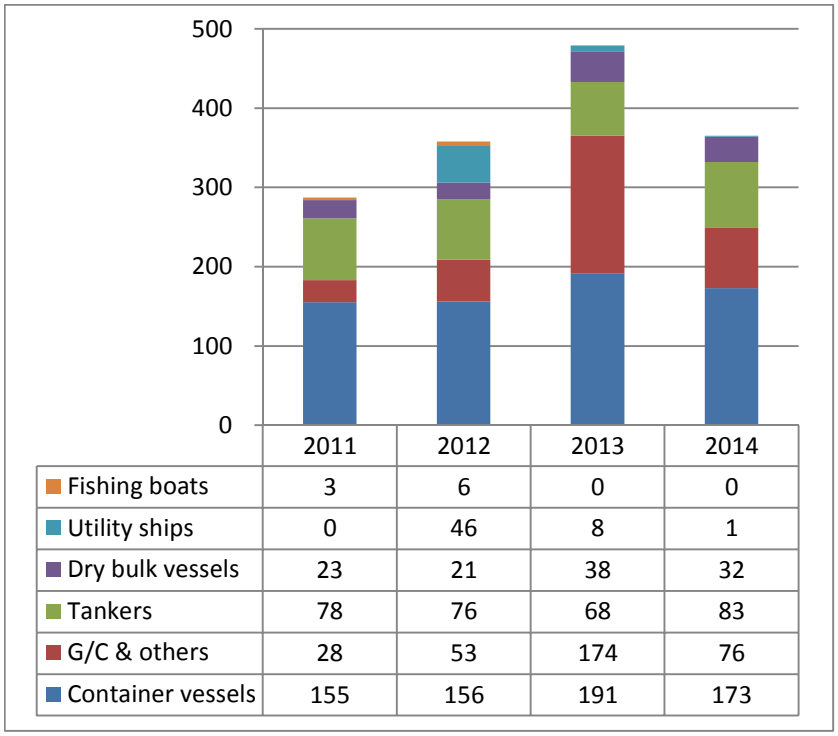


図 4　ナカラ港の寄港船舶数の推移(船種別)

Source: CDN, PN (arranged by the Project Team)

表 6　ナカラ港の定期航路／寄港船舶 (2014 年 6 月 30 日現在)

Shipping Line (slot charterer)	Service Area	Service Name	Vessel Name	Capacity (TEU)	LOA (m)	Draft (m)	Beam (m)	DWT	GT	Service Freqency	Calling Ports
CMA CGM, Maersk Line	East Asia	Mozex	Ada S	2,546	208.91	11.60	29.85	34,334	26,435	weekly	Maputo-Beira-**Nacala**-Port Louis-Port Klang-Tanjung Pelepas-Pointes des Galets-Toamasina-Maputo
			Amalia C	2,452	199.95	11.55	29.80	34,362	25,500		
			CMA CGM La Tour	2,272	195.60	11.01	30.20	30,442	26,050		
			Em Chios	2,506	207.20	11.40	29.80	32,321	25,294		
			Jula S	2,474	207.40	11.40	29.80	33,796	25,414		
			Marie Delmas	2,207	195.60	11.01	30.20	30,453	26,061		
			Natalie Schulte	2,474	207.40	11.40	29.80	33,651	25,674		
			RT Aegir	2,468	208.16	11.40	30.08	34,015	25,608		
CMA CGM (Emirates Shipping Line)	Middle East, East Africa	Swahili Express	Apulia	2,764	207.89	11.50	32.24	35,741	30,047	weekly	Jebel Ali-Khor Fakkan-Mombasa-Dar es Salaam-Zanzibar-**Nacala**-Mombasa-Jebel Ali
			Auguste Schulte	2,590	210.00	11.52	30.17	34,622	27,093		
			Bella	2,674	207.92	11.50	32.24	35,600	30,024		
			Commodore	2,764	275.00	13.62	37.19	61,152	51,836		
			HS Challenger	2,755	207.95	11.50	32.24	35,924	30,024		
			Katharina	2,452	199.85	11.55	29.84	33,900	25,535		
PIL (MOL)	East Asia, East Africa	EA2	Kota Fajar	2,135	193.90	10.27	32.20	28,879	25,497	weekly	Huangpu-Shekou-Nansha-Singapore-Colombo-Dar es Salaam-**Nacala**-Colombo-Pasir Gudang-Singapore-Huangpu
			Kota Nasrat	1,810	179.63	10.70	27.64	25,985	20,902		
			Kota Nebula	1,810	179.67	10.70	27.64	25,985	20,902		
			Kota Nanhai	1,810	179.65	10.70	27.64	25,985	20,902		
			Kota Naga	1,810	179.65	10.70	27.64	25,985	20,902		
			Kota Nabil	1,810	179.65	10.70	27.65	26,000	20,902		
			Kota Nelayan	1,810	179.64	10.70	27.66	25,985	20,902		
			Kota Nekad	1,810	179.67	10.70	27.64	25,985	20,902		
MSC	Feeder	Saf-Moz	MSC Jasmine	2,073	198.91	12.20	32.20	41,771	31,430	weekly	Durban-Maputo-Beira-Mombasa-Dar es Salaam-**Nacala**-Beira-Maputo-Durban
			MSC Nicole	2,073	198.25	12.20	32.24	41,787	31,430		
			MSC Chiara	2,073	198.89	12.20	32.26	41,815	31,430		
			MSC Positano	2,468	206.00	11.42	29.80	34,083	25,713		
			MSC Denisse	2,073	198.89	12.20	32.20	41,771	31,430		
United Africa Feeder Line	Feeder	Mozambique Coastal Express	Falshoeft	903	134.15	8.35	20.40	12,007	8,861	every 36 days	Durban-**Nacala**-Longoni-Mutsamudu-Mtwara-Durban
		Mozambique Coastal Express 2	MCP Linz	629	117.00	6.45	19.74	7,852	5,272	every 12 days	Durban-Maputo-Beira-**Nacala**-Pemba-Durban
			Onego Buran	1,162	117.00	6.40	18.00	7,661	5,338		

Source: Shipping lines' web sites

表 7　コンテナ荷役効率と関連荷役データ（2012~2014 年）

2012	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total / Ave.
Container Handling Volume (TEU)	7,672	5,254	4,913	4,724	4,381	3,908	6,194	5,635	5,960	6,899	4,495	5,128	65,163
Number of Container Ships Berthed (ship)	13	14	12	12	14	9	16	11	14	15	13	13	156
Average Container Volume (TEU) per Call	590	375	409	394	313	434	387	512	426	460	346	394	418
Average Berthing Time per Ship (hour)	68.60	47.70	47.30	43.60	43.90	56.60	45.60	56.20	52.30	55.56	49.62	57.70	
Total Berting Time (hour)	789.1	607.6	487.2	522.0	512.4	428.4	684.8	596.2	687.4	815.7	617.1	725.0	7,472.9
Average Container Handling Volume per Ship Berthing Time (box/hour)	7.0	8.0	7.0	7.0	6.0	8.0	4.0	6.0	6.0	7.0	7.0	3.0	6.3
Average Container Handling Time per Ship (hour)	53.8	34.2	32.3	31.4	26.7	35.2	30.3	47.5	40.7	43.4	37.9	52.7	
Total Container Handling Time (hour) Number of Ships x Average Handling Time	699.0	478.5	387.6	376.8	373.8	316.8	484.8	522.2	569.7	651.0	492.8	685.6	6,038.6
Average Container Handling Volume per Container Handling Time (box/hour)	8	10	9	9	9	9	6	7	7	9	9	4	8.0
Dwelling Time (Average)　(day)													

2013	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total / Ave.
Container Handling Volume (TEU)	7,404	5,646	7,196	6,498	6,450	6,650	5,394	6,953	7,318	7,684	7,644	7,971	82,808
Number of Container Ships Berthed (ship)	15	11	13	12	15	16	18	18	18	16	15	16	183
Average Container Volume (TEU) per Call	494	513	554	542	430	416	300	386	407	480	510	498	453
Average Berthing Time per Ship (hour)													
Total Berting Time (hour)	789.1	607.6	487.2	522.0	512.4	428.4	684.8	596.2	687.4	815.7	617.1	725.0	7,472.9
Average Container Handling Volume per Ship Berthing Time (box/hour)													
Average Container Handling Time per Ship (hour)													
Total Container Handling Time (hour) Number of Ships x Average Handling Time													
Average Container Handling Volume per Container Handling Time (box/hour)				5	7	10	9	8	10	8	9	8	8.2
Dwelling Time (Average)　(day)													

2014	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total / Ave.
Container Handling Volume (Box)	5,592	6,413	5,436	3,594	4,992	5,461	5,261	6,575	6,926	7,681	6,865		64,796
Container Handling Volume (TEU)	7,208	8,752	7,658	5,986	7,403	7,596	7,247	8,826	8,873	10,113	9,140		88,802
Number of Container Ships Called (Ship/mth)	14	17	16	15	20	17	15	16	10	16	15		171
Average Container Volume (Box/ Call)	399	377	340	240	250	321	351	411	693	480	458		393
Average Container Volume (TEU/Call)	515	515	479	399	370	447	483	552	887	632	609		535
Gross Ships Working Hour by 1~3 Gang (Hr)	622.2	930.8	659.2	581.1	624.7	732.4	630.0	739.1	644.0	897.0	868.0		7,928.5
Ave. Gross Ships Working Hour (Hour/Call)	44.4	54.8	41.2	38.7	31.2	43.1	42.0	46.2	64.4	56.1	57.9		46.4
Gross Productivity per Ships Working Hour (Box/hour by 1~3 Ship-gears)	9.0	6.9	8.2	6.2	8.0	7.5	8.4	8.9	10.8	8.6	7.9		8.2
Gross Productivity per Ships Working Hour (TEU/hour by 1~3 Ship-gears)	11.6	9.4	11.6	10.3	11.9	10.4	11.5	11.9	13.8	11.3	10.5		11.2
Dwelling Time (Average)　(day)													

Source: The Monthly and annual reports of the Operation Department of Portos do Norte

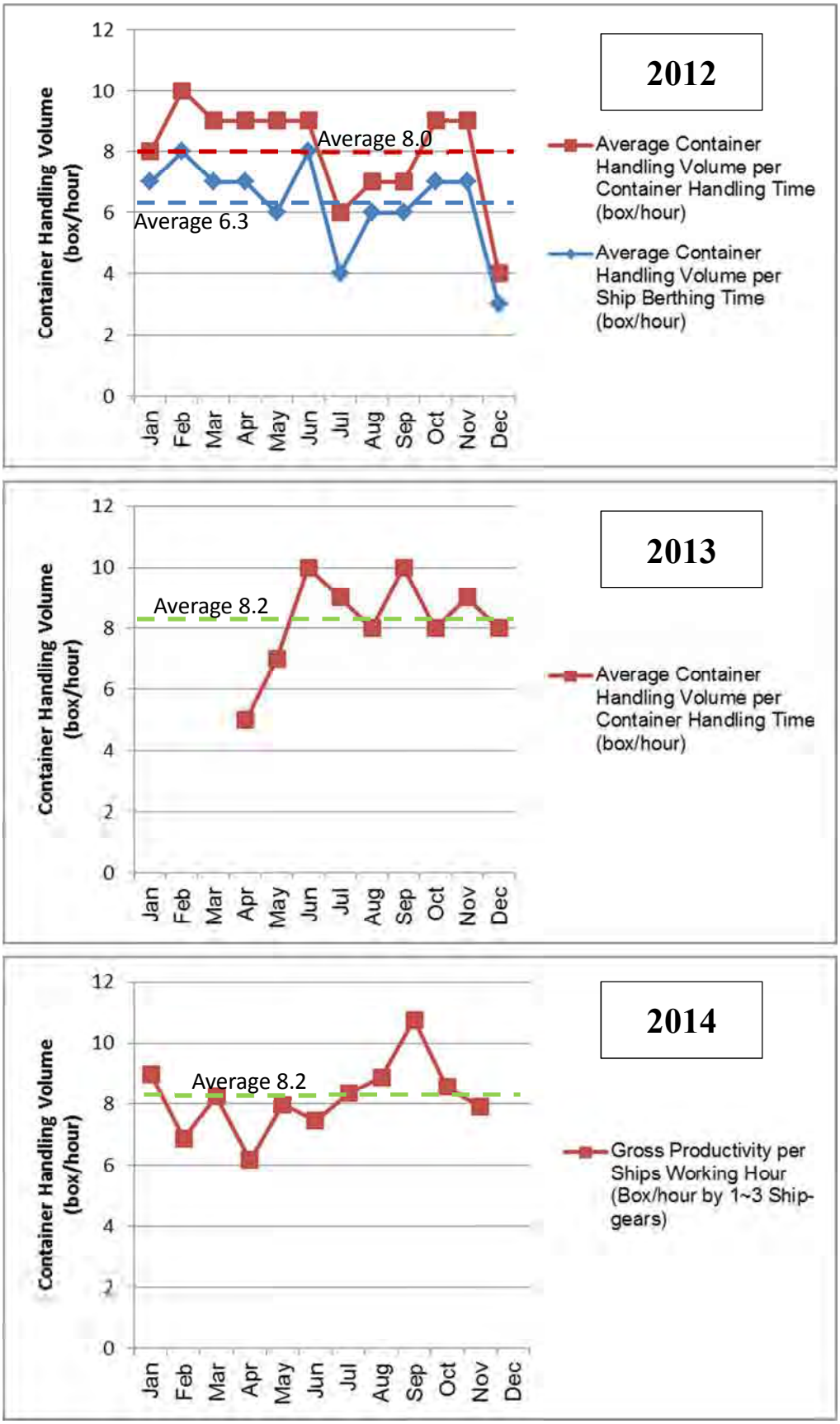


図 5　コンテナ荷役効率（2012~2014 年）

Source: The Monthly and annual reports of the Operation Department of Portos do Norte

表 8　ナカラ港の荷役機械一覧

No.	MACHINE	TIPE/ CAPACITY	MODEL	PRINCIPAL USE	OPERATION AREA
1	Kalmar nº 6	Reach stacker/45Ton	DRF 450-60S5	Full Container	Container Terminal
2	Kalmar nº 7	Reach stacker/45Ton	DRF 450-60S5	Full Container	Container Terminal
3	Kalmar nº 8	Reach stacker/45Ton	DRF 450-60S5	Full Container	Container Terminal
4	Kalmar nº 9	Forklift/42Ton	DC 42-1200	Empty Container / General cargo	Container Terminal / General cargo Terminal
5	SANY RS01	Reach sacker/45Ton	Private (Semi-registered)	Full Container	Container Terminal
6	SANY RS02	Reach stacker/45Ton	Private (Semi-registered)	Full Container	Container Terminal
7	SANY RS03	Reach sacker/45Ton	Private (Semi-registered)	Full Container	Container Terminal
8	SANY RS04	Reach stacker/45Ton	Private (Semi-registered)	Full Container	Container Terminal
8-05	SANY RS05	Reach stacker/45Ton	Private (Semi-registered)	Full Container	Container Terminal
8-06	SANY RS06	Reach stacker/45Ton	Private (Semi-registered)	Full Container	Container Terminal
9	SMV nº1	Top lift/45Ton	SL 45-1200G4	Full Container	Container Terminal
10	SMV nº2	Top lift/45Ton	SL 45-1200G4	Full Container	Container Terminal
11	SMV nº4	Top lift/16Ton	SMV5/6ECB90	Empty Container	Container Terminal
12	SMV nº5	Reach stacker/45Ton	SC4531 TA 5	Full Container	Container Terminal
13	FOTON nº1	Loader 3m³	LF 958G	Trimming	General cargo
14	FOTON nº2	Loader 3m³	LF 958G	Trimming	General cargo
15	CATERPILLAR	Loader 1.5 m³	IT 12	Trimming	General cargo
16	TOYOTA nº1	Forklift 3 Ton	02-7FD35	Stuff Handling	General cargo/Container Terminal
17	T0YOTA nº2	Forklift 2.5 Ton	02- 6FD25	Workshop Stuff Handling	Workshop
18	Container Transfer Crane	LIEBHERR 25 Ton		Full Container	Container Terminal

Source: The Maintenance Department of Portos do Norte　　As of May 2, 2015

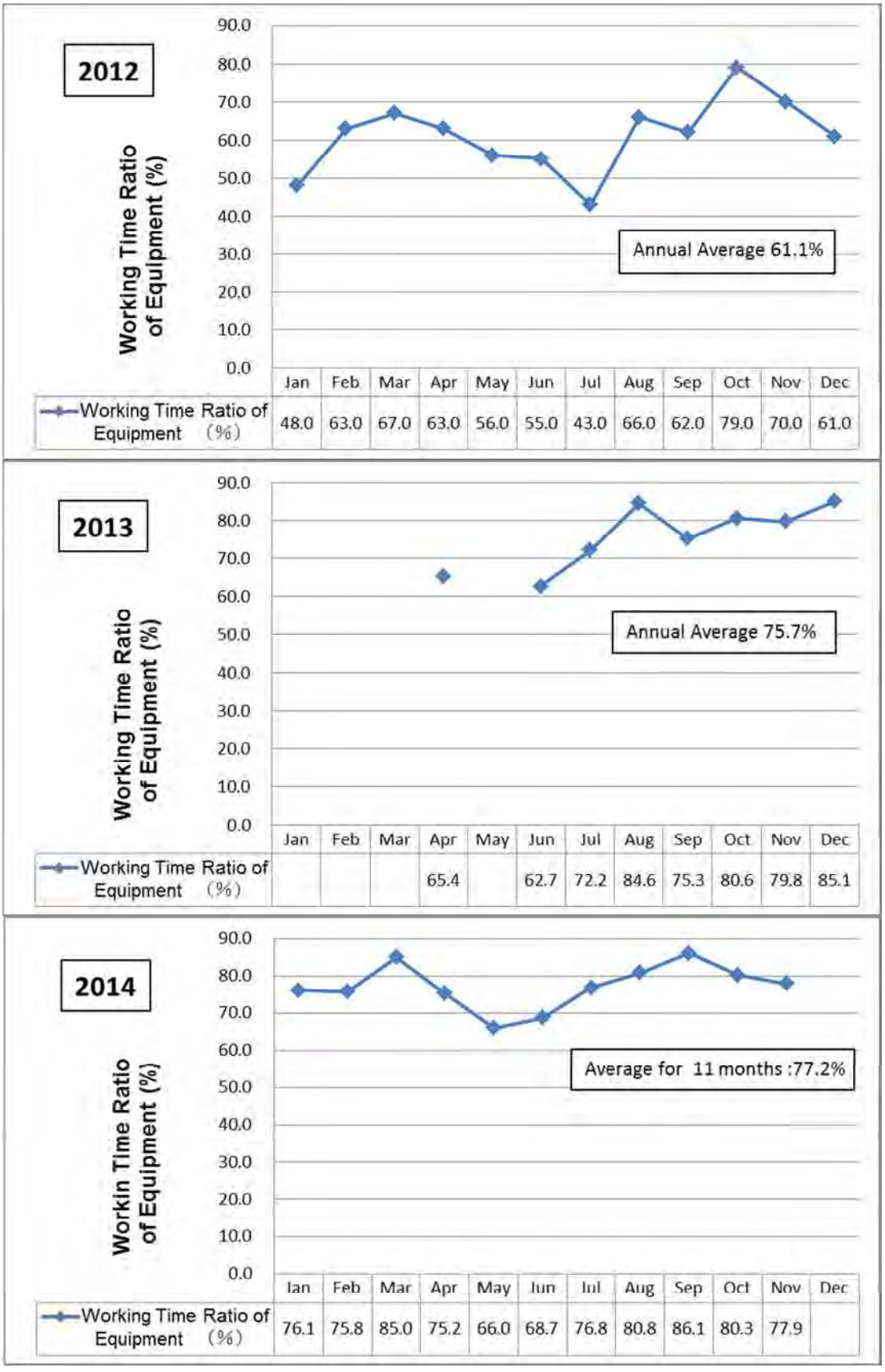


図 6　荷役機械の稼働率

Source: Monthly report of the Maintenance Department of Portos do Norte

表 9　コンテナ荷役機械の整備予算

2014 年

CUSTOS DA MANUTENÇÃO 【メンテナンスコスト】
Custos Projectados 予算
MZM
TC = 32,00 MZM

		2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	2014	Total
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	Descritivo 項目	1月	2月	3月	4月	5月	6月	7月	8月	9月	10月	11月	12月	
														0.00
63212	Electricidade 電気	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	**2,346,000.00**
632121	Electricidade de Escritorio 事務所電気代	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	195,500.00	**2,346,000.00**
	Gerador (Edificio Principal) 発電機													
63213	**Combustiveis 燃料**	630,696.00	630,696.00	630,696.00	630,696.00	630,696.00	630,696.00	630,696.00	630,696.00	630,696.00	630,696.00	630,696.00	630,696.00	**7,568,352.00**
														0.00
632131119	Gasoleo - Maquinas 軽油ー機械	28,196.00	28,196.00	28,196.00	28,196.00	28,196.00	28,196.00	28,196.00	28,196.00	28,196.00	28,196.00	28,196.00	28,196.00	**338,352.00**
														0.00
632132	Restantes combustiveis その他の燃料	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	2,500.00	**30,000.00**
														0.00
632133	Lubrificantes 潤滑油	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	600,000.00	**7,200,000.00**
														0.00
63214	Ferramentas e utens. desgast rapido 工具類(消耗品)				50,000.00						50,000.00			**100,000.00**
	Material de Reparação e manutenção 修理・メンテナンス資機材	1,601,977.00	1,601,977.00	1,796,052.00	2,736,325.00	1,601,977.00	1,883,442.00	1,601,977.00	1,601,977.00	1,968,727.00	1,601,977.00	1,601,977.00	1,755,677.00	**21,354,062.00**
														0.00
63215	Material de manutenção e reparação メンテナンス・修理資機材	1,502,977.00	1,502,977.00	1,657,052.00	2,637,325.00	1,502,977.00	1,744,442.00	1,502,977.00	1,502,977.00	1,829,727.00	1,502,977.00	1,502,977.00	1,616,677.00	**20,006,062.00**
632151	De equipat e inst operacionais オペレーション関連資機材				1,134,348.00					147,500.00				**1,281,848.00**
632152	De equipat e inst habitacionais 施設関連資機材													**0.00**
632153	De Viaturas 車輌関連													**0.00**
6321531	Viaturas-Direccao 車輌ー港湾管理事務所			16,600.00			56,965.00			16,600.00			16,600.00	**106,765.00**
6321532	Viaturas-Administracao & Financas 車輌ーアドミ&会計・経理													**0.00**
6321533	Viaturas-R humanos 車輌ー人事			90,375.00			50,000.00			115,550.00			50,000.00	**305,925.00**
6321534	Viaturas-Op portuarias 車輌ーオペレーション			13,600.00			57,300.00			13,600.00			13,600.00	**98,100.00**
6321535	Viaturas-Servico Maritimo 車輌ー航海サービス													**0.00**
6321536	Viatura-Manutencao 車輌ーメンテナンス			69,475.00			69,475.00			29,100.00			29,100.00	**197,150.00**
6321537	Viatura-Gestao Ambiental 車輌ー環境管理			33,500.00			77,200.00			33,500.00			33,500.00	**177,700.00**
632154	Material de maquinas 機械関連機材	1,502,977.00	1,502,977.00	1,502,977.00	1,502,977.00	1,502,977.00	1,502,977.00	1,502,977.00	1,502,977.00	1,502,977.00	1,502,977.00	1,502,977.00	1,502,977.00	**18,035,724.00**
632155	Material M.Equip.Informatico 情報管理機器													**0.00**
632159	Outros その他													**0.00**
														0.00
63216	**Material de escritório 事務所資機材**													**0.00**
632166	Material Escritorio-Manutencao メンテナンス事務所資機材	5,826.00	5,826.00	5,826.00	5,826.00	5,826.00	5,826.00	5,826.00	5,826.00	5,826.00	5,826.00	5,826.00	5,826.00	**69,912.00**
														0.00
6321	Manutenção e reparação メンテナンス・修理	99,000.00	99,000.00	139,000.00	99,000.00	99,000.00	139,000.00	99,000.00	99,000.00	139,000.00	99,000.00	99,000.00	139,000.00	**1,348,000.00**
632211	De instal. e equipament. Operaciona オペレーション関連資機材	99,000.00	99,000.00	99,000.00	99,000.00	99,000.00	99,000.00	99,000.00	99,000.00	99,000.00	99,000.00	99,000.00	99,000.00	**1,188,000.00**
632212	De instal. e equipament.habitaciona 施設関連資機材			40,000.00			40,000.00			40,000.00			40,000.00	**160,000.00**
														0.00
														31,438,326.00

Legendas:													
	2,433,999.00	2,433,999.00	2,628,074.00	3,618,347.00	2,433,999.00	2,715,464.00	2,433,999.00	2,433,999.00	2,800,749.00	2,483,999.00	2,433,999.00	2,587,699.00	**31,438,326.00**

Totais das contas principais 合計
Subtotais 小計

Annual Maintenance Cost 31,438,326.00
Monthly Average Maintenance Cost 2,619,860.50

2015 年

MAINTENANCE COSTS
Projected costs
MZM

TC = 32,50 MZM **TI = 8%**

	Descriptive	2015 January	2015 February	2015 March	2015 April	2015 May	2015 June	2015 July	2015 August	2015 September	2015 October	2015 November	2015 December	Total
GLOBAL		**7,101,539.49**	**7,107,499.49**	**7,175,089.49**	**11,130,957.86**	**7,093,213.49**	**7,144,539.49**	**7,199,919.49**	**7,158,763.49**	**10,222,164.86**	**7,247,473.49**	**6,917,323.86**	**6,870,653.86**	92,369,138.36
63212	**Electricity**	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	**5,760,000.00**
632121	Port Electricity	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	480,000.00	**5,760,000.00**
63213	**Fuels**	1,259,289.69	1,259,289.69	1,259,289.69	1,259,289.69	1,259,289.69	1,259,289.69	1,259,289.69	1,259,289.69	1,259,289.69	1,259,289.69	1,259,289.69	1,259,289.69	**15,111,476.28**
632131116	Diesel for maintenance	19,200.00	19,200.00	19,200.00	19,200.00	19,200.00	19,200.00	19,200.00	19,200.00	19,200.00	19,200.00	19,200.00	19,200.00	**230,400.00**
632131119	Diesel for Machines	96,040.00	96,040.00	96,040.00	96,040.00	96,040.00	96,040.00	96,040.00	96,040.00	96,040.00	96,040.00	96,040.00	96,040.00	**1,152,480.00**
632132	Petrol	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	2,700.00	**32,400.00**
632133	Lubricants	1,160,549.69	1,160,549.69	1,160,549.69	1,160,549.69	1,160,549.69	1,160,549.69	1,160,549.69	1,160,549.69	1,160,549.69	1,160,549.69	1,160,549.69	1,160,549.69	**13,926,596.28**
63214	**Tools**				65,000.00						65,000.00			**130,000.00**
63215	**Material Repair and maintenance**	5,342,775.33	5,348,735.33	5,404,325.33	9,307,193.70	5,334,449.33	5,373,775.33	5,441,155.33	5,399,999.33	8,451,400.70	5,423,709.33	5,158,559.70	5,099,889.70	**71,085,968.44**
632151	Oper. equip. and electric. installations	223,885.63	223,885.63	223,885.63	4,195,450.00	223,885.63	223,885.63	223,885.63	223,885.63	3,336,511.00	223,885.63			**9,323,046.04**
632152														**0.00**
632153	Vehicles													**0.00**
6321531	Vehicles - Direction		**53,710.00**	26,250.00		**39,424.00**	26,250.00	**53,710.00**	**39,424.00**	26,250.00	**39,424.00**	**63,710.00**	26,250.00	**394,402.00**
6321532	Vehicles - Administration & Finance	**22,750.00**		10,000.00	**22,750.00**		10,000.00			10,000.00			10,000.00	**85,500.00**
6321533	Vehicles - Human Resources			22,500.00			22,500.00	**53,710.00**	**65,550.00**	22,500.00	**65,550.00**		22,500.00	**274,810.00**
6321534	Vehicles - Port Operations	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	15,000.00	**53,710.00**			**188,710.00**
6321535	Vehicles - Security	20,000.00					35,000.00					**53,710.00**		**108,710.00**
6321536	Vehicle - Maintenance		15,000.00		**32,854.00**	15,000.00		**53,710.00**	15,000.00					**131,564.00**
6321537	Vehicle - Safety	20,000.00		**65,550.00**										**85,550.00**
632154	Parts of machines	5,041,139.70	5,041,139.70	5,041,139.70	5,041,139.70	5,041,139.70	5,041,139.70	5,041,139.70	5,041,139.70	5,041,139.70	5,041,139.70	5,041,139.70	5,041,139.70	**60,493,676.40**
632155														**0.00**
632159														**0.00**
63216														**0.00**
632166	**Material-Office Maintenance**	9,474.47	9,474.47	9,474.47	9,474.47	9,474.47	9,474.47	9,474.47	9,474.47	9,474.47	9,474.47	9,474.47	9,474.47	**113,693.64**
63221	**Maintenance and Repair**	10,000.00	10,000.00	22,000.00	10,000.00	10,000.00	22,000.00	10,000.00	10,000.00	22,000.00	10,000.00	10,000.00	22,000.00	**168,000.00**
632211	Installation and operating equipment	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	10,000.00	**120,000.00**
632212	Installation and Housing equipment			12,000.00			12,000.00			12,000.00			12,000.00	**48,000.00**

Legend
Total of key accounts
Subtotals

Source: The Maintenance Department of Portos do Norte