

“Cai Mep - Thi Vai International Port Development Project”

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1. Outline of the Project



Location of the Project



Wind whipped ‘Flag of the Safety’ in Package 1 site

1-1 Objective of the Project

The objective of this project is to improve capacity of the cargo transportation in order to handle increasing cargo demand by constructing two new terminals and relevant facilities, one for container in Cai Mep area and the other for general cargo in Thi Vai area, Ba Ria- Vung Tau District, thereby contributing to the economic development of Southern Vietnam.

1-1-1 Outline of the Project

Outline of the Project is shown in Table 1-1.

Table 1-1 Outline of the Project (1/2)

Items	Contents
Loan Number/ Loan Amount	L/A No. VNX II-2 (STEP) /36,364 million yen
Loan Agreement signing date	31 March 2005
Executing Agency etc.	Project Owner: Ministry of Transport Employer: Project Management Unit 85 (PMU 85) Authority for Operation and Maintenance: VINAMARINE (Vietnam National Maritime Bureau) Operator: To be employed

Table 1-1 Outline of the Project (2/2)

Item	Contract	Description	Contractor
Construction Contract	Package 1 (P1)	Construction of Port Facilities and Buildings for Cai Mep International Container Terminal	TOA Corporation /TOYO Construction Co., Ltd JV
	Package 2 (P2)	Construction of Port Facilities and Buildings for Thi Vai International General Cargo Terminal	Penta-Ocean Construction Co., Ltd /Nissan Rinkai Construction Co., Ltd JV
	Package 3 (P3)	Navigation Channel Dredging	Penta-Ocean Construction Co., Ltd /TOYO Construction Co., Ltd JV
	Package 4 (P4)	Equipment Procurement	to be employed
	Package 5 (P5)	Access road to Cai Mep terminal	CIENCO6/ Truong Son JV (P5 JV)
Consultancy Contract		Japan Port Consultants, ltd /Nippon Koei Co., Ltd JV in association with PCC (JPC JV)	

Note) Package 5 is not included in the scope of this review, because Japanese ODA Loan does not include Package 5 which is funded by the Government of Vietnam.

2. Results of the Mid-Term Review

2-1 Performance

2-1-1 Measures for mitigating Construction risks

Performance Index conformed to Accident Categories (refer to Table-3 in General section) is given in Table-2-1.

The land slide occurred in Package 2 neither caused any damage against the SP PSA terminal operated by a joint venture of Saigon Port and Port of Singapore Authority, nor caused out flow of soil into the fairway, although the land slide occurred nearby SP PSA which has already been in service.

The design of Package 2 can be evaluated from the Risk Management point of view, by the reason that it could prevent secondary damage against the existing terminal in operation, although the fact of occurrence of land slide should not be underestimated.

Table 2-1 Performance Index by Accident Categories

Package	Major← Category →Minor			Remarks
	A	B	C	
Total	0	1	2	
Package 1	0	0	0	
Package 2	0	1	0	Land slide during surcharge
Package 3	0	0	2	The barge “Takuyo-maru” had accidents twice.

The geological site investigation for identifying the cause of land slide occurred on 12 July, 2010 was completed by 31 August, 2010. The task force comprised of the Consultant and the Contractor has been discussing the causes and Countermeasures of this accident, as of the middle of September.

The barge “Takuyo-maru” had minor collision with fishing boat in the early morning of 15 April, 2010 (already amicably settled), and also it was hit by a coal ship on 18 August, 2010. The Port Authority deliberated latter case as of the middle of September. Both cases are categorized as “C” for the reason that relevant authorities did not rule the responsibility of “Takuyo-maru” side.

2-1-2 Measures for mitigating Labour Risk

Table-2-2 shows “Accident Frequency Rate”ⁱ (AFR) and “Accident Severity Rate”ⁱⁱ (ASR) of this project.

ASR of this project is considerably higher than that of Japan, for the reason that a fatal accident happened on July 2009 in the Package 2 was affected on the rate. AFR of this project is 0.33 for entire project and 1.20 for the Package 2 alone. In the case that if the total working hours are less than a million hours, the figure of AFR appears higher than the other cases. Taking account of the condition mentioned above, the figure of Package 2 is evaluated as equivalent to the figure of Japanese domestic civil works. Therefore it is reasonable to say that the daily safety management for this project has been implemented effectively.

Table-2-2 Comparison of AFR and ASR

	AFR (DAFWC*: Nos.)	ASR (DAFW**: man-days)
Project Total	0.33 (1)	2.46 (7,500)
Total man-hours	3,049,905 hours	
Package 1	0.00 (0)	0.00 (0)
Total man- hours	1,363,071 hours	
Package 2	1.20 (1)	8.98 (7,500)
Total man-hours	835,090 hours	
Package 3	0.00 (0)	0.00 (0)
Total man-hours	851,744 hours	
Civil Works in Japan	0.94	0.21

(As of the end of July, 2010)

*DAFWC (days away from work case: Nos.)

**DAFW (days away from work: man-days)

The figures in this review are calculated from the basic data DAFW of which are 4 days or more, as shown below.

The number of accident: 1 (One)

(A worker who engaged the marine operation had disappeared after the end of work, when he left his life jacket with his co-worker, and while his co-workers looked away on him. Later his drowned body was discovered at the bottom of the barge.)

Total working days lost: 7,500 days (One fatal accident)

* Figures for Japan were obtained from the domestic works contract, carried out in Fiscal Year 2007, the contract price of which was more than 1,000 million yen.

(Source: Home page of Japan Advanced Information Center of Safety and Health, Occupational Accidents Statistics)

2-2 Process

The review results for the Consultant and the Contractors for P1, P2 and P3 with respect to the process for mitigating Construction Risks and Labour Risks are shown in Sub-Clause 2-2-1 to 2-2-4. The Contactor is a joint venture of two Japanese Construction Companies. Whole checklists for Safety Management System used in the hearing of P1, P2 and P3 JVs are attached in Reference section at the end of this Report. Summary is included in Sub-Clause 2-2-2 to 2-2-4.

JICA Detailed Design Study was awarded to a joint venture of Pacific Consultants International (PCI) and Japan Port Consultants Ltd. (JPC) and PCI was in charge of design portion. Because at the time of the Study, there was no performance record in Vietnam for ground improvement by PVD (Prefabricated

Vertical Drain) method, the improvement depth of which is more than 35m, the Government of Vietnam requested JBIC to arrange an independent design check. JBIC employed a joint venture of the Port and Airport Research Institute of Japan and Resonator International AB of Sweden as a checking consultant and design check was carried out from October 2006 as “Review of Detailed Design of Soil Improvement in Cai Mep – Thi Vai International Port Construction Project”. The objective of review was to confirm the effectiveness and appropriateness of the selected PVD method.

2-2-1 Consultant (for Construction Supervision)

The terms of reference of the Consultant covers from a review of Detailed Design to Construction Supervision. The Construction has being managed with the original target completion date, ie October 2010. The overall progress rate of the Project is 33.6% as of the end of August 2010. The results of review are as shown in Table 2-3 and Table 2-4.

Table 2-3 Results of review of measures for mitigating Construction Risks by the Consultant

Contents and Results of Review	
Safety Measures for the Permanent Works	<p>The Consultant required the Contractor to carry out a design review based on the results of additional boring, laboratory tests after award of the Contract. The Consultant recommended PMU 85 the Variations to the Works after examination of the results of above review and proposal of the Contractor. The following Variations to give further redundancy to the Works were made.</p> <p>Package 1: By shifting slope line to yard side by 30m, slope stabilization is to be made by changing slope gradient milder and adding more embankment as counter weight. Trestle is to be extended by 30m.</p> <p>Package 2: Adjustment of design by changing slope gradient milder and by adding Deep Mixing Method (DMM) columns on river etc.</p>
Comprehensive Review of Documents	<p>Review of Construction Documents is to be carried out by Expatriate Engineer(s) and Lead Local Engineer(s) and to be submitted to Project Manager (PM) for his approval. Upon the approval of the Consultant, the Contractor may start construction works. SD is to be subject to the final approval of PMU 85.</p> <p>Note) Construction Documents means Shop Drawing (SD):the drawings for Permanent Works on which the Contractor adds the construction details based on the Contract drawings, Working Drawing(WD): Drawings for construction which includes Temporary Works, Method Statement (MS): Statement and drawings which shows the method how to construct the Works, Project Safety Plan(PSP) ,Project Quality Plan(PQP).</p>
Application of Quality Control System (QCS)	<p>QCS specifies the flowcharts and procedures with respect to the following process, in order to keep the Required Quality Standard, RQS.</p> <ul style="list-style-type: none"> ■ Quality control of materials---Inspections at testing laboratory and Inspection at the Site ■ Quality control of the Works---Inspections before and after carrying out the works <p>QCS applied to the Project was used by PMU 85 and the Contractors.Sub-Clause 8.1 of Conditions of Contract, Part II Particular Application requires the Contractor to implement Quality Assurance System.</p>

Table 2-4 Results of review of measures for mitigating Labour Risks by the Consultant

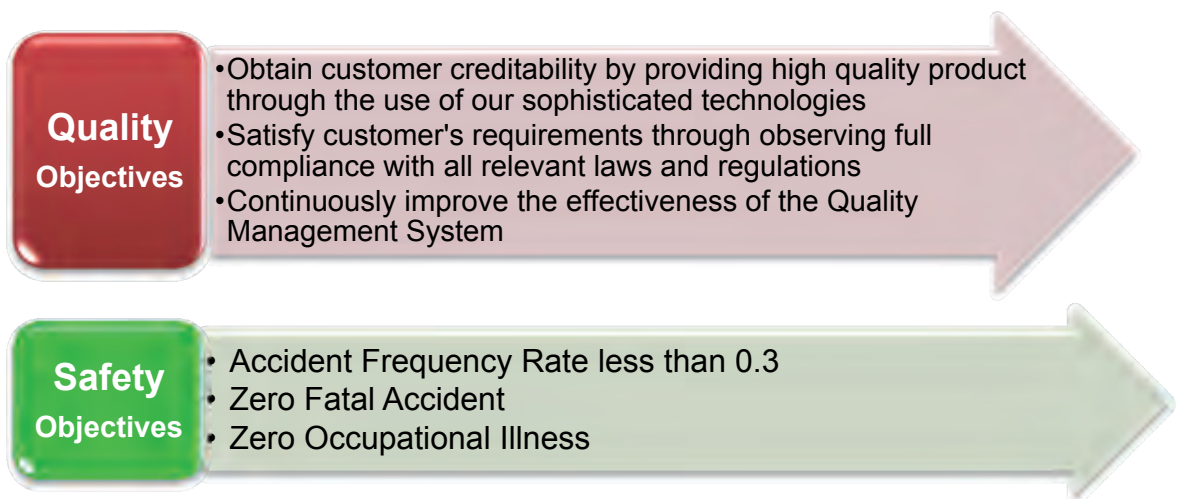
Contents and Results of Review	
Joint Safety Patrol with PMU 85 and the Contractor	Monthly joint safety patrol with PMU 85 and the Contractor were carried out to point out unsafe actions/items with attendance of Expatriate Engineers. After the patrol, a meeting was held to discuss corrective actions to be taken and follow up the actions agreed in the previous patrols. Records of patrols were kept by the person in charge of attending parties including PMU 85.
Attendance of Local Engineers to Regular Patrol	Local Engineers were attended to the regular patrols, other than Monthly joint safety patrol stated above, organized by the Contractor and where he identifies non-conformance actions/items, he reports them to Expatriate Engineers. Expatriate Engineers, after examining the situations by himself and if necessary he takes actions, such as issuing instruction for corrective actions to the Contractor.

Special Notes:

In respect of manpower of the Consultant, recruiting of local engineers and inspectors with appropriate qualifications and experiences is essential to keeping the control of the Consultants over Safety and Quality, and is also necessary for further technology transfer.

2-2-2 P1 JV (Construction of Port Facilities and Buildings for Cai Mep International Container Terminal)

At the time of review, PVD works and subsequent surcharge embankment works have nearly been completed and preparation works for steel pipe piling works for jetty, drainage and pavement for yard, building works, are on-going. Quality and Safety objectives for P1 JV are as follows.



Review of the Permanent Works was carried out in the manner stated below.

After commencement of the Works, additional site investigations were carried out and based on the result of such investigations, design review in accordance with Sub-Clause 8.1 “Contractor’s General Responsibilities” of Conditions of Contract were carried out by the design department of JV leading firm Head office. By this review, a necessity of variation of the Works was recognized and proposal for varied

design was compiled by the same department and a proposal for varied design was submitted to the Consultant for his review and further recommendation to PMU 85. Design review and varied design were carried out under the procedures of Quality Management System of International Division which has the certification of its conformance to ISO 9001 requirements issued by Lloyds. The Variation to the Works was authorized within the framework of traditional FIDIC conditions in which design responsibilities rest on the shoulder of the Employer (the Consultant).

Review Results of P1 JV are shown in Table 2-5.

Table 2-5 Review Results of P1 JV

Items	Contents and Results of Review	
Measures to mitigate Construction Risks	Internal Review of Documents(MS/SD) by the Contractor	
	The Contractor	Team of construction department (Team) makes a draft of Construction Documents based on a discussion with Subcontractor(s). (Generally speaking, Subcontractor is not able to prepare Construction Documents by himself) Primary review: Construction Manager Final review: Project manager (PM) After approval of PM, Construction Documents are to be submitted to the Consultant at least 14 days prior to the commencement of the works.
	Communication method with workers of the contents of the documents approved by the Consultant and checking measures on Site	At the commencement, a kick off meeting with attendance of Subcontractor’s management, staff and workers is arranged. Compliance is checked by Team staff daily on site and also by weekly Quality Control Audit carried out by QC section. A site instruction is to be issued for major non-compliance identified requesting rectification by Subcontractor.
	<p>➤ Internal Inspection Procedures QC section, who is familiar with Inspection & Test Plan (ITP), organizes internal inspection (Material---QC section, Works---Construction staff) and submission of Request for Inspection (RFI) to the Consultant.</p> <p>➤ Quality Management System (QMS) Quality Management System of International Division of JV leading firm is applied to the site quality management. The above QMS was certified by Lloyds for its compliance to the requirements of ISO 9001.</p>	
Measures to mitigate Labour Risks	<p>➤ Risk Management Job Safety and Environmental Analysis (JSEA) which has the same objectives as Risk Management of Labour Risks are carried out by a leadership of Vietnamese Safety Manager who studied JSEA in United States of America. Hazards/Risks are identified for each step of works, ie delivery of piles, lifting piles and so on. Considering Consequences, Reduction measures, risk rating is made. After compiling JSEA table, Safety Manager explains the contents of JSEA table to the workers at toolbox meeting before commencing works.</p>	

Items	Contents and Results of Review
	<p>➤ Safety Activities Upon entry to the site: Safety induction training is carried out for all new workers. Daily Activities: Toolbox meeting, Daily safety meeting (normally it is carried out first thing in the afternoon. The agenda of the meeting are Progress of the work after daily meeting of previous day, Today's work schedule, Coordination between Subcontractor's work and Safety instructions by the Contractor. The contents and intent of the meeting is the same as that specified in Article 636 of Ordinance on Industrial Safety and Hygiene in Japan, in which coordination between Subcontractor's works are carried out and the records of meeting are to be kept in certain period.) Weekly Activities : Weekly Safety Patrol Monthly Activities: Safety Promotion Meeting, Monthly Joint Safety Patrol with PMU85/ the Consultant/ Safety Officer(s) of Subcontractor(s). After joint patrol, Safety Committee is to be held with the same attendants.</p> <p>➤ Safety Training Based on HSE Program and Training Plan 2010 prepared by Safety Manager, emergency drill, fire drill and responsive actions towards Vietnam National Safety Week in 2010 were carried out systematically.</p> <p>➤ Safety Management System (SMS) Safety Management System of International Division of JV leading firm is applied to the site safety management. The above SMS was certified by Lloyds for its compliance to the requirements of OHSAS 18001.</p>

2-2-3 P2 JV (Construction of Port Facilities and Buildings for Thi Vai International General Cargo Terminal)

At the time of review, it is expected that PVD, Deep Mixing Method (DMM) columns and surcharge embankment works have been completed and the same preparation works as those of Package 1 would commence. However due to the occurrence of local land slide in July 2010, most of the Works was suspended. Quality and Safety objectives of P2 JV are as follows.

Quality Objectives

- To execute all the Works without any "Non-conforming" Product
- To eliminate any delay and to complete the Project Works in timely manner based on Construction Programme
- Execute the Works with zero fatal accident, and with due regard to the safety and welfare of the workforce

Safety Objectives

- To achieve ZERO in the number of fatality, and reduce labour & public incident
- Accident Frequency Rate: Less than 0.90
- Accident Severity Rate : Less than 0.05
- Prevention of Falling, Heavy equipment & Crane Accident: Less than 10
- Reduction in accidents in the measure of full implementation of Risk Assessment

After the review of Permanent Structure, the same procedures as those applied in Package 1 Variations to the Works in which DMM columns on river are added and slope gradient is changed to be milder. Design review and proposal for varied design were made and prepared by International Construction Department in International Division of JV leading firm. A proposal was submitted to the Consultant for his review and recommendation to PMU 85. The Variation to the Works were authorized within the framework of traditional FIDIC conditions in which design responsibilities rest on the shoulder of the Employer (the Consultant).

Review results of P2 JV are shown in Table 2-6.

Table 2-6 Review results of P2 JV

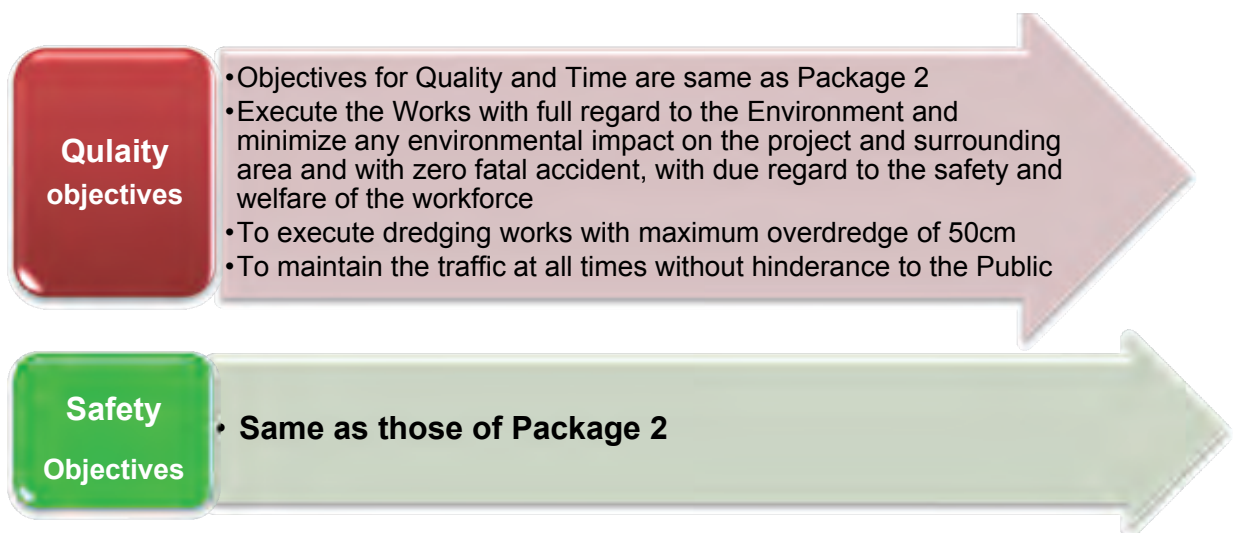
Items	Contents and Results of Review	
Measures to mitigate Construction Risks	The Contractor’s Internal Review of the Construction Documents (MS/SD etc.)	
	The Subcontractor	Prepare a draft of the Construction Documents based on a discussion with the person(s) in charge of the Contractor
	The Contractor	Primary Review: CM or equivalent engineer(s) Final Review: PM After PM approves the Construction Documents (specifically MS), those are circulated in all the staffs of the site office.
	Communication method with workers of the contents of the documents approved by the Consultant and checking measures on Site	Approved Construction Documents by the Consultant are sent to the Subcontractor with a submittal form and receipt by the Subcontractor is sent in return. It is the Subcontractor’s responsibility to keep every worker informed and understood about the contents of MS. The engineers of the Contractor and staffs of the Subcontractor checks whether the works are carried out in accordance with MS on site.
<p>➤ Internal Inspection Procedures QC section, with a cooperation of construction section, arranges all internal inspection. Based on the results, QC section submits Request for Inspection to the Consultants.</p> <p>➤ Risk management Risk Management for Construction Risks were carried out the construction, specified in QMS, such as before contract award and after contract award.</p> <p>➤ Quality Management System Quality Management System of International Division of JV leading firm is applied to the site quality management. The above QMS was certified by Lloyds for its compliance to the requirements of ISO 9001.</p>		

Items	Contents and Results of Review
Measures to mitigate Labour Risks	<p>➤ Risk assessment for Safety and Environment Before preparing detailed MS for each work, hazard identification is carried out and based on the seriousness and frequency, a primary risk assessment is made. After considering the mitigating measures, a secondary assessment is carried out with such mitigation measures. The results are reflected in MS.</p> <p>➤ Safety Activities Upon entry to the site: Safety induction training is carried out for all new workers. Daily Activities: Toolbox meeting, Daily safety meeting (same as Package 1) Weekly Activities : Weekly Safety Patrol By-weekly activities: Safety Check including electric facilities Monthly Activities: Safety Promotion Meeting, Monthly Joint Safety Patrol with PMU85/ the Consultant/ Safety Officer(s) of Subcontractor(s). After joint patrol, Safety Meeting is to be held with the same attendants. Monthly safety report is briefed by HSE (Health, Safety and Environment) Manager of the Contractor.</p> <p>➤ Safety Training Although a training schedule like Package 1 did not exist, fire drill, Oil Spill Response Plan etc. were carried out on-demand basis. As responsive actions towards Vietnam National Safety Week in 2010, educations on Safety and Hygiene, competition between workers in respect of safety knowledge, safety award to the workers who shows good safety practice in the work.</p>

2-2-4 P3 JV (Navigation Channel Dredging)

Progress rate of Package P3 reached to 98% of original quantities in contract Bills of Quantities as of July 2010, only dredging of upstream sections and trimming of the downstream by local dredgers were carried out at the time of review.

Quality and Safety Objectives of P3 JV are as follows. Because JV leading firm of P3 JV is the same company as that of P2 JV, the same Quality and Safety Objectives are applied.



The results of P3 JV are shown in Table 2-7.

Table 2-7 Review result of P3 JV

Items	Contents and Results of Review	
Measures to mitigate Construction Risks	The Contractor's Internal Review of the Construction Documents (MS/SD etc.)	
	The Subcontractor	Prepare a draft of the Construction Documents based on a discussion with the person(s) in charge of the Contractor
	The Contractor	Primary Review: CM or equivalent engineer(s) Final Review: PM or Deputy PM Numbers of MS are low compared to other works because navigation channel dredging is main work of the Contract.
	Communication method with workers of the contents of the documents approved by the Consultant and checking measures on Site	Communication method of approved Construction Documents is as follows. The Contractor's staff carry out the meeting at 07:20 every morning on duty, 1. Communication is made at the time of regular meeting in Japanese or English for Foreign dredgers 2. The Contractor's staff explains a local staff of the Subcontractor when he comes to JV office for reporting progress and he keeps the workers on Local dredgers informed and understood.
	<p>➤ Internal Inspection Procedures Internal Inspections by the Contractor carried out at the same time as the daily confirmation of as-built of dredged shape.</p> <p>➤ Risk Management Risk Management for Construction Risks were carried out the construction, specified in QMS, such as before contract award and after contract award.</p> <p>➤ Quality Management System Quality Management System of International Division of JV leading firm is applied to the site quality management. The above QMS was certified by Lloyds for its compliance to the requirements of ISO 9001.</p>	
Measures to mitigate Labour Risks	<p>➤ Risk Assessment for Dredging works In respect of maneuvering of dredgers and dredging works, hazards were identified and mitigation measures were studied and established. MS were prepared to reflect results of Risk Assessment and the contents of MS were briefed to the Contractor's staffs, the Subcontractor's staffs and workers.</p> <p>➤ Safety Activities Upon entry to the site: Safety induction training for new works on the dredgers etc. was made on the dredgers by the Contractor's staffs. Daily: Toolbox meeting, Daily Safety Meeting (same as Package 1, but in early morning) Weekly: Weekly Safety Patrol on every Tuesday Monthly: Monthly Joint Safety Patrol with PMU85/ the Consultant/ Safety Officer(s) of Subcontractor(s). After joint patrol, Safety Meeting is to be held with the same attendants.</p> <p>➤ Emergency Response Procedures Typhoon Evacuation Emergency Procedures, Emergency Contact List for dredging works etc. were established and trainings were done accordingly.</p>	

3. Mid-Term Review Results, Lesson Learned and Recommendation

3-1 Mid-Term Review Results

3-1-1 Performance

As of the end of August 2010 at progress rate of 33.6%, there is no Category A accident. Although a local land slide during surcharge embankment, damage to the SP PSA terminal next to package 2 site and outflow of soil into the fairway could be avoided. In this regard, this accident is classified as category B.

ASR of the Project, ie 2.46, is approx. ten times of that of Civil Works in Japan, ie 0.21. This is because one fatal accident occurred in 2009 significantly affected. On the other hand, AFR, ie 0.33, is well below of that of Civil Works in Japan, ie 0.94. It can be judged that a day to day safety management activities were carried out well.

3-1-2 Process

3-1-2-1 Measures mitigating Construction Risks

(1) Design of Permanent Works

Detailed Design was carried out as “JICA Detailed Design”. Upon the request of government of Vietnam, JBIC arranged a joint venture of the Port and Airport Research Institute of Japan and Resonator International AB of Sweden to independently review the design of PVD.

In Package 1 and Package 2, because the necessity of Variation to the Works was identified in design review of the Contractor, the Contractor prepared and submitted his proposal for varied design. The Consultant reviewed the proposal submitted by the Contractor and recommended PMU 85 for authorizing variation. Variations to the Works were made by PMU 85 upon recommendation of the Consultant.

(2) Risk Management

Risk Management was made in the construction review meeting before contract award, after contract award and/or before commencement of the Works in accordance with the procedures in QMS applied for P1, P2 and P3 JV.

(3) Emergency Response Manual

Each JV has prepared emergency manual which handles an expected emergencies, such as Typhoon Evacuation procedure prepared by P3 JV, Oil Spoil Response Plan prepared by P2 JV, Emergency procedure for injured workers and transportation to the hospital prepared by all JV.

P2 JV had no emergency response manual for a local land slide in P2 because it is not normal practice for Japanese contractor to anticipate such accident. Judging from the results, the design of Package 2 is considered to include reasonable redundancy to avoid the serious damage to the existing terminal or affects to the fairway.

(4) Degree of achievement for requirements in Quality Management System

QMS of International Division of Head office of JV leading firm, which has a certificate issued by the internationally recognized certification body, was applied to the site work of P1, P2 and P3 JV. Particular Application of Conditions of Contract specifies the requirement for introduction of QMS and Decree No. 209/2004 on Quality Management of Construction works in Vietnam includes provisions for QMS encouraged the Contractor to do so. Input errors were identified in fundamental items of Project Quality Plan and confirmation field of Safety Documents of P2 JV.

3-1-2-2 Measures for mitigating Labour Risks

(1) Degree of achievement for requirements in Safety Management System (OHSAS)

With respect to P1 JV, the requirements of SMS were fulfilled because the certified SMS to OHSAS 18001 of JV leading firm was applied and maintained as per OHSAS 18001. Regarding P2 JV and P3 JV nearly the same procedures were applied for Safety Management. Although internal audit for safety management was not carried out because OHSAS itself was not introduced, both JVs includes safety aspects in internal audits of QMS.

(2) Measures for mitigating Labour Risks

In addition to Monthly joint safety patrol with PMU 85/ the Consultant/ the Contractor, the following safety management activities which becomes normal exercise of the construction sites in Japan, were carried out.

- Safety induction training for workers newly entered into the site
- Daily toolbox meeting before start of works
- Daily Safety meeting for reporting, coordination, discussion of safety issues etc.
- Weekly and Monthly Safety patrol
- Monthly Safety Promotion meeting with attendance of all workers on site (“Anzen Taikai” in Japanese)

When a method statement was prepared, due considerations were made to the hazards and countermeasures identified in Risk Management for Labour Risks.

3-2 Recommendations

3-2-1 Recommendation for Executing Agency

It is recommended to let the personnel assigned to Safety management to attend at the Monthly joint safety patrol with the Consultant and the Contractor and state opinions of PMU 85 as the Employer.

3-2-2 Recommendation for the Contractor

3-2-2-1 Recommendation for P1/P2 JV

Current Safety Management activities, ie safety induction training, weekly patrol etc., are to be continued against increased operations for drainage works, pavement work and building works on site. Necessary modification should be made to suit the conditions on site.

3-2-2-2 Recommendation for P2 JV

Project Quality Plan requires correction for removing discrepancy in wordings. Other documents are to be reviewed in respect of correct English wording.

It is recommended for the Consultant and P2 JV to re-evaluate their Quality Control System and/or Quality management System in order to prevent occurrence of the accidents in the future construction activities. Based on the results of re-evaluation, where necessity is identified, the System should be improved.

3-3 Lesson Learned

Safety objectives for three JVs for the Project are to lower the AFR within target and Zero fatal accident, but not “Zero Accident” which has been the traditional safety policy for Japanese contractors. It is considered that introduction of Risk Assessment and Safety Management System into civil works in Japan spreads rapidly and the contractors are gradually obliged to apply the same into overseas works.

Introduction of risk management into overseas works will require the Japanese contractors to apply policy, such as “the accidents which has beyond allowable severity could not be acceptable, although it is not possible to achieve zero-accident by eliminating all accidents” as stated in Note of Sub-Clause 1-2-4 of this Report, instead of traditional policy of “Zero Accident”.

