1．ミニッツ

MINUTES OF DISCUSSIONS
BETWEEN THE JAPANESE ADVISORY TEAM
AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT
OF THE UNITED MEXICAN STATES
ON THE JAPANESE TECHNICAL COOPERATION
FOR THE REFINERY SAFETY TRAINING CENTER PROJECT

The Japanese Advisory Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Yuji Hosoya, visited the United Mexican States from November 22 to December 3, 1999, for the purpose of evaluating the achievement of the Refinery Safety Training Center Project (hereinafter referred to as "the Project") at mid-term of the cooperation period and having discussions on the plan for the rest of the cooperation period and the necessary measures to be taken by both the Japanese and the Mexican side.

During its stay in the United Mexican States, the Team had a series of discussions and exchanged views with the Mexican authorities concerned over the matters for the successful implementation of the Project.

As a result of the discussions, both sides agreed upon the matters referred to in the documents attached hereto.

Mexico City, December 2, 1999

Yuji Hosoya
Leader
Advisory Team
Japan International Cooperation Agency (JICA)
Japan

Francisco Delgado Cortes
Production Subdirector
PEMEX Refining
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THE ATTACHED DOCUMENT

1 Mid-term Evaluation

Joint Coordinating Committee recognized the Joint Evaluation Report which was submitted as the result of the joint work by both sides, shown in Appendix 1.

2 Revision of the Project Design Matrix and the Plan of Operations

Both sides agreed to revise the existing of Project Design Matrix (hereinafter referred to as "PDM") and made the draft of the third version of PDM as shown in Appendix 2, in order to show the framework and the contents of the actual activities of the Project precisely.

The Mexican side stated and the Team agreed that as for indicators of Project Purpose and Output 2, it is necessary to consider the detailed and specific means of verification, in order to estimate improvement of safety level and labor behavior hereafter, to use monitoring and evaluation.

The Team explained and the Mexican side understood that the Record of Discussions (hereinafter referred to as "R/D"), which was signed by both sides on September 25, 1996, need to be amended for recognition of the draft above mentioned, after consideration by the authorities concerned of the government of Japan.

Both sides agreed to revise the existing Plan of Operations (hereinafter referred to as "PO") for whole period and made the draft of the second version of PO, in accordance with the draft of the third version of PDM above mentioned, as shown in Appendix 3, based on the progress of the activities implemented hitherto and recommendation of the Joint Evaluation Report above mentioned.

The Team explained and the Mexican side understood that the progress of the Activities and the achievement of the Outputs and Project Purpose need to be periodically monitored whether or not the Project is progressing as scheduled, based on PO and the Annual Plan of Operations, which is preferably reformed according to the standardized form developed in JICA.

3 Other Issues

3.1 Management of the Project Operation

Both sides agreed that the steering committee, which is held twice a month between Salamanca Refinery and the Refinery Safety Training Center, bears responsibility for promoting field activities, and monitoring its progress.

3.2 Future Activities and Input

3.2.1 Increase of the Number of the Trainees in Japan

The Mexican side requested increase of the number of Trainees in Japan, because training to the managers in Japan is effective to improve safety consciousness and understanding of effectiveness of the Japanese safety method, who are expected to play an important role to implement the Japanese safety method in the field of Salamanca Refinery.

The Team recognized its importance and answered that it requires further consideration among the authorities concerned of the Japanese government.

3.2.2 Appraisal on Improvement of Labor Behavior

The Mexican side explained to the Team that appraisal on improvement of labor behavior through the activities of the Project is very important and necessary to judge the effectiveness of the Project, and requested dispatch of short-term experts who can appraise improvement of labor behavior.

The Team recognized its importance and answered that it requires further consideration among the authorities concerned of the Japanese government.

3.2.3 Observation of Safety Activities in Other Refineries of PEMEX

The Mexican side requested that Japanese experts visit other refineries of PEMEX in order to observe implementation of Japanese safety method in those refineries.

The Team answered that it requires further consideration among the authorities concerned of the Japanese government.

4 Attendance at the Discussions

The attendance at the discussions is as shown in Appendix 4.

LIST OF APPENDIXES

JOINT EVALUATION REPORT

AT MID-TERM

ON THE SAFETY TRAINING CENTER PROJECT

IN THE UNITED MEXICAN STATES

Mexico City, December 2, 1999

I. The Project Design Matrix for Mid-term Evaluation

Both sides agreed to evaluate based on the Project Design Matrix (hereinafter referred to as "PDM"), shown as Annex 1.

II. Accomplishment of the Plan

1. Tendency of Indicators in the Project Design Matrix — See Annex 2.

2. Progress of Activities — See Annex 3.

III. Five Evaluation Components

1. Effectiveness

	Achievement	Contributing Factors	Restricting Factors	Reference
Output 0. The organization and management system of the Project is established	• In accordance with R/D, 2 counterparts have nominated to each Japanese expert, and Refinery Safety Training Center (hereinafter referred to as "CES") and its organization and its duties are clearly defined. • Total number of counterparts is enough for the training in CES, but is not enough for the application activities of Japanese safety method in the fields of RIAMA.	• The importance of the Project is well understood. • Reconstruction of CES has finished at the beginning of the Project. • Local cost for the projec has been secured sufficiently.		Annex 4 Annex 5 Annex 6
1. Safety knowledge is acquired by all the employees	• Training in CES has been proceeded on schedule, and safety knowledge has been improved. • Management personnel upper than Area chief have trained a little in the safety common course which was already held. The management skill up course will be held soon to resolve the problem. • The knowledge and technique has improved trough the training of inspection by the short-term experts from the beginning of the Project • Training by CIDESI has been carried out, but schedule is delayed.	• As the top management people in RIAMA understand the importance of the Project, the attendance ratio has keeping high grade. • As the Video system is utilized for training in CES, the trainee understands well the course.		Annex 7 Annex 8 Annex 9 Annex 10 Annex 11
2. All the employees take preventive measures by analyzing potential hazards at work	• Before starting maintenance work or at plant operation, KYK has been implemented in accordance with the work permission sheet, which is required in RIAMA regulation. (Implementation ratio is approximately 30% as of end of June 1999). However, KYK do not implemented spontaneously by understanding its effectiveness. • Although RIAMA has introduced Hiyari-Hatto, actual implementation ratio is not clear. • The activities on HAD are developing at the morning meeting for only checking cloth and helmet, but little at the field work. • Further training in CES would be required. • RIAMA is introducing the	• Implementation of KYK has been put on duty in Shock Plan in RIAMA.	• The workers understand the importance of KYK and HAD trough the training in CES, however they do not understand how to develop it at the site and not comply with the effectiveness. • For the development at the site, the responsible person in line is necessary. However, the responsible person is not assigned and job demarcation on safety is not clear in line organization.	

	Hiyari-Hatto activity after deciding a manual.			
3. All the employees observe the procedures and regulations.	• Almost all the employees are wearing the uniforms and helmets now. At present, although promoting to use chin straps and goggles, the using ratio has not reached to sufficient level.	• Compared to the situation before the Project starts, safety consciousness of the employees has been improved.	• The contents of regulations on using personal protective equipment are not precise. Necessary instructions to the employees who don't use the equipment are not given thoroughly. • Chin straps and goggles are not provided to everyone. • Although instructions should be given to them daily in order to let the employees use the protective equipment more thoroughly, the engineers in line don't recognize the necessity enough.	
4. Recognition to unsafe condition is improved.	• Finding out of unsafe condition has been done by CES staff, which will be submitted as report. • RIAMA is also investigating unsafe conditions. • As to improvement of misunderstanding condition, recommendation on setting up the marks for blind plate management of shut-down maintenance was submitted and implemented.			
5. Safety information is utilized in each section.	• Morning meetings are held and safety information is notified in each section. Especially, almost all the working places of process are now holding turnover meetings and mornings. Morning meetings are held in many workshops of maintenance, but rarely in the plant before maintenance work starts. • Proposals have not been presented, except for the existing system in process. Moreover, the system to accept and implement the proposals is not established.	• In process, turnover meetings and morning meetings are recognized to be important and held daily. • Top managerial personnel have recognized that disclosure of information on accidents and Hiyari-Hatto can decrease accidents. • RIAMA ordered to inform of accidents and Hiyari-Hatto.	• Although, it is relatively easy for Operation sections to hold meetings as there are operation groups, maintenance sections don't have much opportunity to group. • In some sections, communication between process and maintenance is not enough.	
6. Safety activity plan is implemented in each section,	• Top managerial personnel came to recognize that there is some problem about safety management system, because KYK and HAD were not implemented as smoothly as expected. • Although the target as whole RIAMA has been clarified, concrete targets and operational plans of each section are not formed and implemented.			

Project Purpose Safety level in Salamanca Refinery is improved.	Considering "improvement of safety level" with four aspects (that is, safety consciousness, safety knowledge, safety rule, and safety management system,), safety level of RIAMA has been improved certainly, especially in the following matter. · Safety consciousness and knowledge of workers has improved certainly, through training in CES and field activities, comparing with the beginning stage of the Project. For example, · The ratio of wearing uniforms and personal protective equipment has been increasing. · In some working places, the employees made the safety promotion posters by themselves. However, it needs time before all the employees recognize effectiveness of Japanese method (APP, Hiyari-Hatto, HAD, 5S) and those method are implemented continuously in the organization. One of the reasons is that there are still some inhibiting factors, as explained in the right column. But, it is expected that the Project will progress rapidly hereafter, because attitude of the top managers of RIAMA toward the Project activities has become more positive.	• Through training in Japan, the training skill of C/P has become more sufficient, and they are able to instruct in the field activities with more self-confidence. • As one of good chance to contribute the safety activities, CES staffs attended to the Safety Patrol and made recommendations to the concerned personnel, at the shut-down maintenance work period, when many workers gathered.	• Circumstances to implement Japanese safety method (consciousness and techniques of the employees, safety management system) were not as ready as expected when the Project started. • Since the personnel who bear responsibility or who promote to instruct in the line to improve safety level, are not clearly defined, the level of progress differs among the sections, depending on the section chiefs. • Middle managerial personnel have not understood how safety is important to decrease accidents, and have not considered that the line personnel should bear responsibility for safety promotion. • Safety promoters have already been assigned and understood their own role, it is quite difficult to practice because the line engineers don't support them in some cases.	

2. Impact

	Impact	Reference
1. Direct Impact (Within Salamanca Refinery)	Through this Project, the labor behavior of the employees is clearly improved and the employees are feeling it actually. Compared to the situation before start this Project, followings are greatly improved. ・ Working area is kept clean ・ Meetings in each section are held ・ Starting time of the work is observed ・ Engineers came to prove positively themselves leadership at the meetings On the other hand, the number of accidents is decreasing year by year. It seems that the implementation of this project is contributing to decrease the accidents. From now on, at the stage of development of Japanese safety method, which were trained in CES, the rudimental accidents which are avoidable by implementing KYK and HAD, must be decreased.	
2. Indirect Impact (Outside of Salamanca Refinery	In the " Shock Plan", which were introduced recently, many Japanese safety activities are included. Further more, PEMEX directed to proceed KYK and HAD activities at all the refineries. On the other hand, some engineers from Cadereyta, Madero, Minatitlan, Salina Cruz, Tula, and maritime terminals had received the training course on KYK, Hiyari-Hatto and HAD in CES. The mentioned above means that PEMEX is recognizing the importance of Japanese safety method. Moreover, depend on requirement from Municipality of Guanajuato and Salamanca, seminars on Japanese safety method were held.	Annex 12

3. Efficiency

	Efficiency	Reference
1. Size and Timing of Input		
(Japanese side)		
(1) Dispatch of Experts	The number, the field, the technical level and the timing of dispatch were appropriate.	Annex 13
(2) Provision of Equipment	The equipment provided by Japan was appropriate, and well utilized in RIAMA and CES.	Annex 14
(3) C/P Training in Japan	Concerning CES C/P, the number of trainees is appropriate. However, in order to enhance understanding of the managerial personnel of RIAMA for further implementation of Japanese method and improvement of safety management system efficiently, it is to be desired that they be also trained as Japan.	Annex 15
(Mexican side)		
(1) Allocation of C/P	The number and the technical level are appropriate. However, transfer of some C/P was an obstacle for technical transfer by Japanese experts.	Annex 5
(2) Building and Facility	The timing and contents was appropriate.	Annex 16
(3) Local Cost	Local cost necessary for CES operation has been expended appropriately.	Annex 6
2. Supporting System		
(1) Joint Coordinating Committee	Held once a year, it has functioned as a meeting where progress and problems of the Project are reported, and future plan is authorized.	
(2) Steering Committee	The joint meeting is held twice a month, between CES (Chief of CES and Japanese experts) and RIAMA (general manager, chief of production unit, superintendents), for implementation and consolidation of Japanese method. Hereafter, in order to promote the whole organization of RIAMA to participate actively, this meeting is expected to play an important role.	Annex 17
(3) Headquarter of PEMEX	Necessary support has been provided.	
(4) Supporting Committee in Japan	Necessary support has been provided.	
3. Linkage with other cooperation projects	Training courses on inspection for ASNT Level 2/3 have been implemented by the linkage of the CIDESI Project.	Annex 9

4. Relevance

1. Relevance of Overall Goal (Productivity of Salamanca refinery is improved)	As improvement of productivity is one of the policies common among all the refineries of PEMEX, Overall Goal is still relevant at this moment.
2. Relevance of Project Purpose (Safety level of Salamanca refinery is improved)	Improvement of safety level will contribute to improvement of productivity.
3. Relevance of the whole plan of the Project	Accidents happen in RIAMA more frequently than advanced countries on safety, and main cause of those accidents is human error, which is mainly due to low-level safety consciousness and labor behavior of the employees. Japanese method (5S, HAD, APP, Hiyari-Hatto) is expected to improve the safety level of RIAMA, through improvement of the safety consciousness of staffs, as it's main idea is bottom-up approach. Besides, Japanese method is consistent with SIASPA, which is the main safety management plan of PEMEX. Therefore, the relation of Project Purpose and Output is relevant. However, the implementing schedule of the Project was not adequate enough, because it has taken more time and activities for implementing the Japanese method than that expected when the Project started, as circumstances to implement Japanese method were not as ready as expected when the Project started.

5. Prospect of Sustainability

	Prospect of Sustainability	Reference
1. Institutional aspect	(1) Personnel Necessary personnel for CES activities are allocated (2) Organization CES has already given necessary authority and responsibility to implement the training, and support and recommend for practicing at the field. However, in order to sustain the achievement of the Project in RIAMA after the Project ends., establishment of safety management system (especially, managerial personnel are well functioned) is indispensable.	Annex 5 Annex 4
2. Financial aspect	PEMEX will be able to secure enough budget for the activities after the Project ends.	Annex 6
3. Technical aspect	The techniques and knowledge of CES C/P has already reached to the level enough to implement the training courses. However, in order to implement activities by themselves after the Project ends, techniques for effective instruction need to be transferred within 2 years.	

Ⅳ.Necessity of Revision of the Plan, and Recommendations

1. Necessity of Revision of the Project Plan	Generally speaking, the activities of the Project are now progressing steadily, and the Project seems to achieve its aim within the rest of cooperation period. Although there is some restricting factors, both Mexican and Japanese side are making best effort to eliminate these factors. Therefore, there is no necessity for revision of the Project plan as a whole. However, to enhance the efficiency of the Project operation, and to assure the achievement of the Project purpose, there are a few matters to be considered, as follows.
2. Recommendation on Plan of the Project	Insufficient understanding and cooperation of middle managerial personnel is the obstacle for implementing Japanese method at work. Hereafter, it is very important to make approaches to these middle management personnel. Moreover, because more time and activities are necessary to proceed field activities than that expected when the Project started, sufficient and adequate input needed to be timely implemented.
3. Recommendation on Organization and Management System of the Project	In order to put the Project activities into practice smoothly in RIAMA, the following matters need to be considered. To consolidate safety promotion and management system, in order to assure that the safety activities are implemented in the line. (for example, to decide who bears responsibility for implementation of the line, or for instruction and advice on the safety activities promotion of whole RIAMA. • To establish the system for monitoring the progress of this Project's activity for consolidating at field in RIAMA. • To clarify the responsible person for corresponding to the recommends by CES. Besides, the following matters are indispensable for smooth operation of CES. • Not to transfer C/P to other sections, as it would retarded technical transfer from Japanese experts.

LIST OF ANNEXES

PROJECT DESIGN MATRIX FOR MID-TERM EVALUATION (1/2)

Annex 1

Detailed Contents of Narrative Summary	Indicators	Means of Verification	Important assumption
(Overall Goal) Productivity of Salamanca Refinery is improved.	Unplanned unit shut-down frequency due to incidents originated by human error decreases	Daily reports of refinery operation and/or operation records for each processing unit	• There will be no serious changes in the social and economic situation affecting operations of the refinery • The policy of PEMEX's top management will not change
(Project Purpose) Safety Level of Salamanca Refinery is improved	Safety Level of Salamanca Refinery is improved. (For reference) Total number of accidents, injury frequency rate and injury severity rate	Check list Accidents record	• Regulations on the environmental and energy saving enforcement will not deteriorate productivity
(Outputs) 0. The organization and management system of the Project is established	0-1 The number of counterparts allocation is to be based upon the Minutes of Discussion in principal (confirmed by each year) 0-2 The authority and responsibility of the project organization are clearly defined	0-1 Allocation record of counterparts 0-2 Record of CES	• Accidents due to the causes other than human error do not affect the safety level • Maintenance and repair works keep the present job level
1. Safety knowledge is acquired by all the employees	1-1 Completion ratio of training courses is over 90%. 1-2 Test passing (over 60%) ratio after safety training is over 80%. 1-3 Qualified inspector's ratio of certification ASNT level-2 is over 60%.	1-1 Training records of CES 1-2 Result of achievement on training 1-3 List of certification	
2. Labor behavior is improved	2-1 Labor behavior is improved		
3. All the employees take preventive measures by analyzing potential hazards at work	3-1 KYK implementation ratio is over 80% 3-2 HAD implementation ratio is over 80% 3-3 Number of Hiyari-Hatto reported by employees increase every year. 1 per person in 2001 3-4 5S implementation ratio is over 80%	3-1~3-4 Implementation record And audit	
4. All the employees observe the procedures and the regulations	4-1 Using ratio of helmet and chinstrap is over 80% 4-2 Using ratio of the attached documents of work permission is over 80% 4-3 Using ratio of the check lists of necessary facility check item is over 80%	4-1~4-3 Patrol report	
5. Recognition of unsafe conditions is improved	5-1 The number of unsafe conditions pointed out is decreased. 5-2 Marks and identifications to prevent misunderstanding are improved	5-1 Report of pointed out 5-2 Number of improved sections	
6. Safety information is utilized in each section	6-1 Holding ratio of meeting in each section is over 80 %. 6-2 Proposals is presented in each section	6-1 Meeting report 6-2 Report of proposals	
7. Safety activity plan is implemented in each section	7-1 Safety activity plan of each section is presented to refinery manager 7-2 Safety activity plan is implemented in each section.	7-1 Safety activity plan 7-2 Evaluation report / Audit	

PROJECT DESIGN MATRIX FOR MID-TERM EVALUATION (2/2)

Detailed Contents of Narrative Summary		Input		Important assumptions
(Outputs) 0. The organization and Management system of the Project is established	(Activities) 0-1 Allocate counterparts and administrative staff 0-2 Stipulate duties of functions 0-3 Install the organization for the decision and the meeting	Japanese Side Dispatch of experts Long term • Chief Advisor • Project coordinator • Safety administration • Maintenance safety • Process safety Short term • Technical inspection and others • Acceptance of C/Ps training in Japan Provision of equipment	Mexican Side • Space, building and facilities • Assignment of counterparts • Equipment and materials • Local cost	• Mexican counterparts continue to work for the Project • Training courses are not interrupted by ad hoc operation in Salamanca Refinery • Salamanca Refinery allocate appropriate budget necessary for application of Japanese method to the Refinery
0. Safety knowledge is acquired by all the employees	1-1 Transfer necessary knowledge for conducting training to counterparts. 1-2 Carry out training of safety common course including Japanese safety method 1-3 Carry out training of process safety course 1-4 Carry out training of maintenance safety course 1-5 Carry out training of management skill-up course 1-6 Carry out training of safety advanced course 1-7 Carry out training on inspection technology for inspectors 1-8 Carry out training on HAZOP and accident analysis 1-9 Improve existing safety training system and its contents			Pre-conditions • The Mexican Government supports the Project • PEMEX recognizes the importance of safety training program • Salamanca Refinery cooperates extensively with this project.
2. Labor behavior is improved	2-1 Carry out training of labor behavior			
3. All the employees take preventive measures by analyzing potential hazards at work	3-1 Implement KYK 3-2 Implement HAD (Calling with a pointed finger) 3-3 Implement Hiyari-Hatto 3-4 Implement 5S			
4. All the employees observe the procedures and the regulations	4-1 Conduct to follow the attached documents in work permission 4-2 Conduct to follow the safety regulation for maintenance work and the maintenance work procedure. 4-3 Conduct to follow the safety regulation for operation and operation manual			
5. Recognition of unsafe conditions is improved	5-1 Decrease unsafe conditions 5-2 Improve the present marks and identifications to prevent misunderstanding			
6. The safety information is utilized in each section	6-1 Hold morning meeting, TBM and turnover meeting. 6-2 Stimulate to present proposals on safety matter			
7. Safety activity plan is implemented in each section	7-1 Assign safety engineers and safety promoters in each Section 7-2 Clarify the duties and responsibilities of each concerned personnel in each section 7-3 Stimulate to make activity plan 7-4 Implement the activity			

TENDENCY OF INDICATORS

Annex 2

Detailed Contents of Narrative Summary	Indicators	Tendency Index (As of end of Sep. 99)					
		1996	1997	1998	1999	2000	2001
(Overall Goal) Productivity of Salamanca Refinery is improved	Unplanned unit shutdown frequency due to incidents originated by human error decreases. ( ) means total unplanned unit shutdown.	16 (44)	10 (29)	16 (44)	5 (14)		
(Project Purpose) The Safety Level of Salamanca Refinery is Improved	The safety level of Salamanca Refinery is improved (For reference) Total accidents Injury frequency rate Injury severity rate	 79 1.43 195	 77 1.07 66	 67 1.38 371	 51 2.37 792		
(Outputs) 0. The organization and management system of the Project is established	0-1 The number of counterparts allocation is to be based upon the Minutes of Discussion in principal (confirmed by each year) 0-2 The authority and responsibility of the project organization are clearly defined	Ok Ok	Ok Ok	Ok Ok	Ok Ok		
1. Safety knowledge is acquired by all the employees	1-1 Completion ratio of training to counterparts is 100% 1-2 Completion ratio of training on safety common course is over 90% 1-3 Completion ratio of training on process safety course is over 90% 1-4 Completion ratio of training on maintenance safety course is over 90% 1-5 Completion ratio of management skill-up course is over 90% 1-6 Completion ratio of safety advanced course is over 90% 1-7 Completion ratio of education on inspection is over 90% 1-8 Completion ratio of education on HAZOP and accident analysis course is over 90% 1-9 Test passing (over 60 points) ratio after training to all employees is over 80% (sampling at random) 1-10 Qualified inspectors ratio of certification ASNT level-2 is over 60%.	— — — — — — — — — —	100 — — — — — — — — —	100 8 8 8 — — 90 — — —	100 52 52 52 — — 95 — 96 — 75		
2. Labor behavior is improved	2-1 Labor behavior is improved						
3. All the employees take preventive measures by analyzing potential hazards at work	3-1 KYK implementation ratio is over 80% 3-2 HAD implementation ratio is over 80% 3-3 Number of Hiyari-Hatto reported by employees increase every year. 1 per person in 2001 3-4 5S implementation ratio is over 80%	— — — —	— — — —	— — — —	30 30 — —		
4. All the employees observe the procedures and the regulations	4-1 Using ratio of helmet and chinstrap is over 80% 4-2 Using ratio of attached documents of work permission is over 80% 4-3 Using ratio of check lists of necessary facility check item is over 80%	— — —	— — —	— — —			
5. Recognition of unsafe conditions is improved	5-1 The number of unsafe conditions pointed out is decreased. 5-2 Marks and identifications to prevent misunderstanding are improved	— —	— —	— —	— —		
6. The safety information is utilized in each section	6-1 Holding ratio of meeting in each section is over 80 %. 6-2 Proposals is presented in each section	— —	— —	— —	60 —		
7. Safety activity plan is implemented in each section	7-1 Safety activity plan is presented to refinery manager 7-2 Safety activity is implemented in each section	— —	— —	— —	— —		

Annex 3

Progress of activities

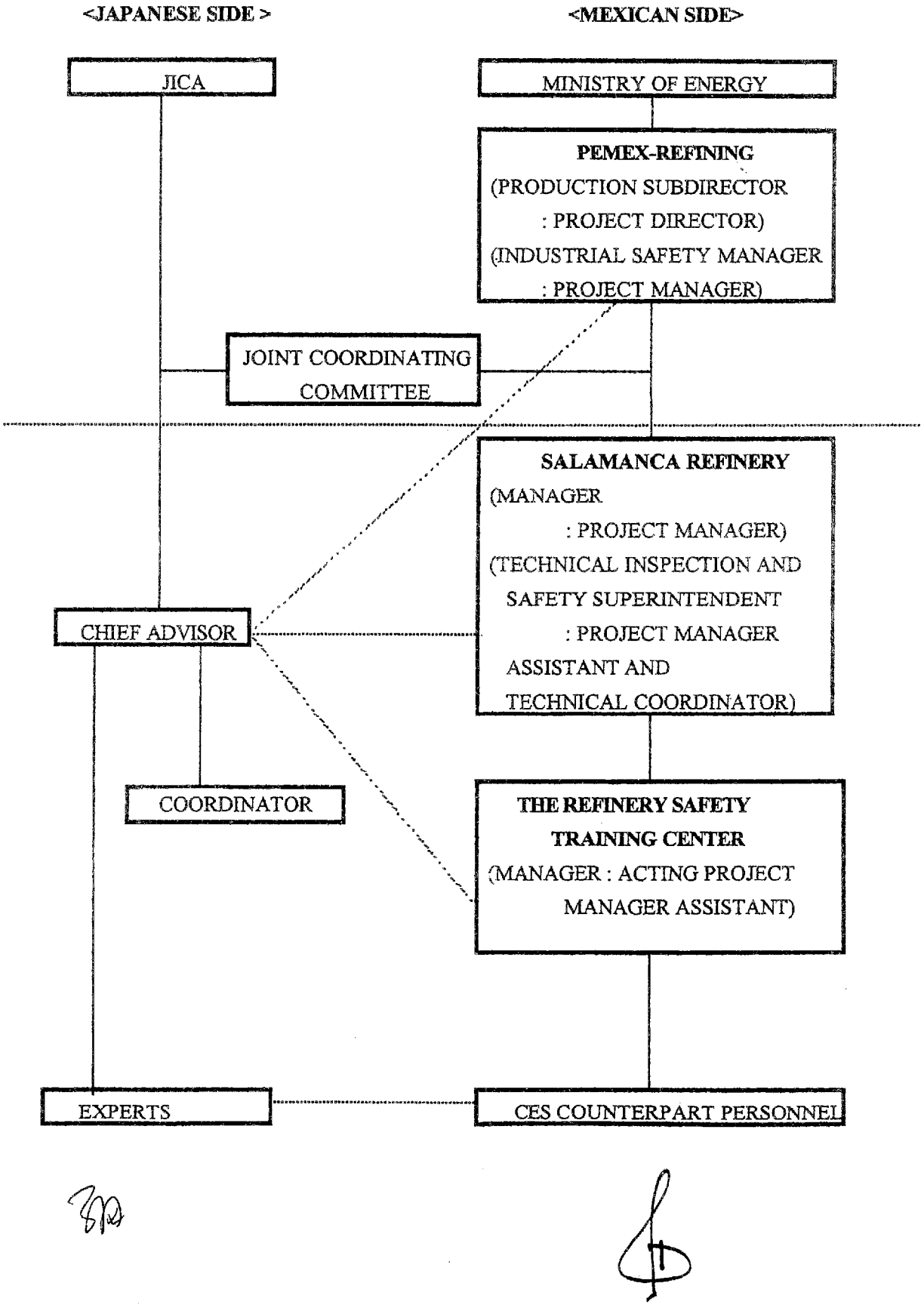
Detailed Contents of Narrative Summary		Progress of Activities	Reference
(Outputs) 0. The organization and management system of the Project is established	(Activities) 0-1 Allocate counterparts and administrative staff 0-2 Stipulate duties of functions 0-3 Install the organization for the decision and the meeting	(1) At the beginning of the project, 2 counterparts have nominated to each Japanese expert. 13 counterparts have been allocated now. (2) CES and its organization have been established and its duties are clearly defined in accordance with R/D.	Annex 6 Annex 5
1. Safety knowledge is acquired by all the employees	1-1 Transfer necessary knowledge for conducting training to counterparts. 1-2 Carry out training of safety common course including Japanese safety method 1-3 Carry out training of process safety course 1-4 Carry out training of maintenance safety course 1-5 Carry out training of management skill-up course 1-6 Carry out training of safety advanced course 1-7 Carry out training on inspection technology for inspectors 1-8 Carry out training on HAZOP and accident analysis 1-9 Improve existing safety training system and its contents	(1) Technical transfer to the counterparts has finished by the end of Mar. 1998. (2) Training to the engineers: 98/8 ~ 99/2 No. of engineer; 311 (90%) Training (phase-1) to the workers: 99/3 ~ 99/6 No. of workers; 3849 (99%) Training (Phase-2) to the workers: 99/8 ~ (3) Inspection management: 97/7 ~ 97/10 Non destructive Inspection technology: 98/3 ~ 98/5 Inspection technology for corrosion: 99/3 ~ 99/5 Inspection technology (UT): 99/10 ~ 99/11 (4) CES is investigating training system in RIAMA.	Annex 8 Annex 9 Annex 10 Annex 11
2. Labor behavior is improved	2-1 Carry out training of labor behavior	(1) Training to the engineers: 98/8 ~ 99/2 Training to the workers: 99/3 ~	
3. All the employees take preventive measures by analyzing potential hazards at work	3-1 Implement KYK 3-2 Implement HAD (Calling with a pointed finger) 3-3 Implement Hiyari-Hatto 3-4 Implement 5S	(1) KYK and HAD have been introduced to the site at Sep. 98 and have been promoted to consolidate by CES. (2) Hiyari-Hatto activities are not developed in work place. Although RIAMA has introduced Hiyari-Hatto, actual implementation ratio is not clear. (3) 5S activities are not introduced at site, however the floor is cleaned during the shutdown maintenance period.	
4. All the employees observe the procedures and the regulations	4-1 Conduct to follow the attached documents in work permission 4-2 Conduct to follow the safety regulation for maintenance work and the maintenance work procedure 4-3 Conduct to follow the safety regulation and operation manual	(1) CES instructed following activities during the shutdown maintenance work • Morning meeting attending all of the workers • Instruct to put the helmet, chin trap, goggles • Safety patrol in the plant area with area manager and concerned personnel • Consolidation to put on the personal protective equipment • KYK, HAD and Hiyari-Hatto • Point out the dangerous work and/ or unsafe action • Recommendation on shutdown maintenance work (2) CES prepared equipment check lists and instructed to use at site	

1

5. Recognition of unsafe conditions is Improved	4-1 Decrease unsafe conditions 4-2 Improve the present marks and identifications to prevent misunderstanding	(1) Finding out of unsafe condition by CES: Mar. 99~June 99 Recommendation: Nov. 99 (2) RIAMA is also investigating the unsafe condition. (3) As to improvement of misunderstanding condition, recommendation on setting up marks for blind flanges was submitted by CES and installed during the shutdown maintenance work.	
6. Safety information is utilized in each section	5-1 Hold morning meeting, TBM, and turnover meeting. 5-2 Stimulate to present proposals on safety matter	(1) CES made an instruction paper to inform the accidents, Hiyari-Hatto and other company information at the morning meeting, TBM and turn over meeting, and supervised them. (99/3~99/6) (2) CES instructed to hold a morning meeting and its contents during the shutdown maintenance (3) CES has investigated on accidents/ incidents information system in RIAMA.	
7. Safety activity plan is implemented in each section	6-1 Assign safety engineers and safety promoters in each section 6-2 Clarify the duties and responsibilities of each concerned personnel in each section 6-3 Stimulate to make activity plan 6-4 Implement the activity 6-5 Assign safety engineers and safety promoters in each section 6-6 Clarify the duties and responsibilities of each concerned personnel in each section 6-7 Stimulate to make activity plan 6-8 Implement the activity	(1) RIAMA nominated safety promoters in each work area and CES has instructed how to proceed safety activities (about 250 promoters) (2) Training to the safety promoters has been done. (Mar. 99, Aug. 99) (3) RIAMA nominated safety promoters (engineer) in each plant. CES will make a recommendation of their duties and responsibilities. (4) CES instruct to the site how to supervise the safety activities. (5) From Oct. 99, CES had a meeting with RIAMA superintendents regarding how to function PDCA continuously	

Annex 4

ORGANIZATION CHART FOR THE ADMINISTRATION OF THE PROJECT



Annex 5

List of Mexican Counterpart Personnel

(As of 01 Dec. '99)

Assignment	Number of C/Ps	Name
Project Director	1	Ing. Francisco Delgado Cortes
Project Manager of Head Office	1	Ing. Emilio Diaz Francez
Project Manager of the Project Site	1	Ing. Miguel Tame Dominguez
Assistant Project Manager	1	Ing. Jose Luis Torres Martinez
Chief of Safety Training Center	1	Ing. Jesus Manuel Almanza Torres
Safety Administration	5	Ing. Carlos Rafael Cuevaz Zaldo Ing. Isabel Victoria Alvarez Araujo Ing. Teodoro Castro del Valle Sr. Jesus Rueda Trujillo Sr. Juan Zavala Zuniga
Maintenance Safety	3	Ing. Victor Manuel Munguia Zuniga Ing. Fernando Martinez Fernandez Sr. Francisco Castro Lopez
Process Safety	3	Ing. Sergio Gonzalez Beltran Sr. Ernesto Casados Galarza Sr. Enrique Salgado Cardenas
Inspection	2	Ing. Candelario Enrique Cu Gutierrez Sr. Jose Guadalupe Escalante Salazar
Secretaries	3	
Driver	1	
House Keeper	1	

Annex 6

PEMEX BUDGET ALLOCATION

(PEMEX FY 1996 - 2001)

UNIT: US DOLLAR

ESTIMETED LOCAL COST FOR THE PROJECT

(1) FOR CONSTRUCTION

	1996	1997	1998	1999	2000	2001
1. Building	375,990.00	—	—	—		
2. Furniture	24,010.00	—	—	—		
SUBTOTAL	400,000.00	—	—	—		

(2) FOR OPERATION

	1996	1997	1998	1999	2000	2001
1. Wages	—	194,755.00	194,755.00	194,755.00	194,755.00	194,755.00
2. Services	—	1,650.00	1,650.00	1,650.00	1,650.00	1,650.00
3. Consumables	—	6,690.00	6,690.00	6,690.00	6,690.00	6,690.00
4.Maintenance	—	—	—	3,280.00	3,280.00	3,280.00
5. Several Expenses	—	93,120.00	93,120.00	93,120.00	93,120.00	93,120.00
SUBTOTAL	—	296,215.00	296,215.00	299,495.00	299,495.00	299,495.00

BUDGT EXECUTION (Exchange rate, 1996=7.60, 1997=7.9, 1998=9.14, 1999=9.67)

(1) CONSTRUCTION

	1996	1997	1998	1999	2000	2001
1. Building	375,990.00	—	40,000	—		
2. Furniture	24,010.00	—	—	—		
3. Computers	—	7,895.00	—	—		
SUBTOTAL	498,500.00	7,895.00	40,000	—		

(2) OPERATION

	1996	1997	1998	1999	2000	2001
1. Wages	—	317,368.00	304,191.00	135,908.00		
2. Services	—	11,737.00	11,284.00	11,084.00		
3. Consumables	—	6,690.00	9,995.00	1,898.00		
4.Maintenance	—	—	1,236.00	1,657.00		
5. Several Expenses	—	10,526.00	18,120.00	8,658.00		
SUBTOTAL	—	296,215.00	344,826.00	159,205.00		

(1999 : Jan. to Sep.)

Items of Technology Transfer to the Counterparts (1/3)

I. Long-term Experts

[1] Safety administration

1. Basic knowledge of safety
1.1 Fundamentals of safety management
1.2 Preventive measures against accident and incident recurrence
1.3 Various kinds of hazards and preventive measures
1.4 Prevention of behavioral accident
1.5 Safety measures for operation and works
1.6 Working regulation
1.7 Safety activities at work

2. Japanese safety activities
2.1 Concept and significant of Japanese safety activities
2.2 KY activity (Danger prediction activity)
2.3 5S
2.4 Hiyari-Hatto
2.5 Calling with a pointed finger
2.6 Zero accident activities
2.7 Daily safety activities
2.8 Safety audit
2.9 Small group activities

3. Education to improve working behavior
3.1 Education and training system
3.2 Japanese labor management

4. Others
4.1 Point of safety and health
4.2 The story of New KYT
4.3 Introduction to KYT/ KYK activity

[2] Process safety

1. Process characteristics
1.1 Operation Condition
1.2 Characteristics of handling materials

2. Precaution during operation
2.1 Safety measure performed by the process side
2.2 Items to be considered when issuing work permission

3. Example of process accidents and troubles
3.1 Introduce what happened in refineries in Japan and how the countermeasures were made

4. Additional items
4.1 Improving the basic knowledge level concerning the refinery operation
4.2 Raise the reliability of process plants
4.3 Small maintenance by operators
4.4 TPM (Autonomous maintenance)

[3] Maintenance safety

1. Improvement of maintenance management
1.1 Introduction of Japanese maintenance management technology
(1) Characteristics of Japanese management
(2) Japanese maintenance management

2. Confirmation of perfect diffusion of maintenance safety manuals
2.1 Preparation of maintenance safety manuals which everyone should knows
(1) Typical Japanese safety standards
(2) Safety requirements of behavior
2.2 Measures against recurrence of defective repairs
(1) Introduction typical Japanese method
2.3 Design modification control
(1) Introduction typical Japanese method
2.4 Qualification and certification system for welding technician
(1) Introduction Japanese system

3. Safety measures
3.1 Safety procedures for maintenance work
(1) Safety procedure for maintenance work
(2) Work flow and assignment of daily maintenance
(3) Work permit system during operation
(4) Work permit system during shutdown
(5) Work order for sub-contractor
(6) Safety review system before and after turnaround maintenance
(7) Contracting maintenance work and control of sub-contractor
(8) Order the educational contents on the safety of maintenance works

4. Communication between department
4.1 Typical Japanese activities
4.2 Communication between department

II. Short-term Experts

1. Non-destructive Inspection Technology
2. Inspection Technology for Corrosion
3. Non-destructive Inspection Test for Reactor

Annex 8

List of Training Material

1. For Engineer

1.1 Phase-1 (31st August 1998 – 16th October 1998) (1/4)

SAFETY COMMON	PROCESS SAFETY	MAINTENANCE SAFETY
How Japanese companies work?	Japanese Safety Measures Adoption	Maintenance Administration
Feeling danger experience	A Japanese operator working day	Video: Introduction to TPM
Why Japanese safety level has been increased	How to keep a unit safe through a daily surveillance	Introduction to TPM
KYK Danger Prediction Activity	Introduction to TPM	Video: Preventive & Predictive Maintenance
Movement from the labor force to the administrative top	Video: Introduction to TPM	Small Group Activities TPM
	TPM for operators	
	Autonomous Maintenance Program	

1.2 Phase-2 (19th October – 12th November 1998)

SAFETY COMMON	PROCESS SAFETY	MAINTENANCE SAFETY
Japanese Safety Administration in Petroleum Refineries	Properties and handling of hazardous materials	Planned Maintenance
Safety Administration Systems I & II	Video: Static electricity	Video: (Visual Control – General Look)
Accident & Incident investigation and information systems	Reviewing of manuals regarding safety	Autonomous Maintenance
Keys for safety administration	Points to stress on before emitting a work permission	Video: (Visual Control – Storage)
5S´s activities	Improving safety in Process Units	
Video: 5 steps for 5S´s	General considerations about static electricity	

1.3 Phase-3 (16th November – 10th December 1998)

SAFETY COMMON	PROCESS SAFETY	MAINTENANCE SAFETY
Preventive Measures for accidents and incidents	Permissions within operation duties	Oriented improves Part I
Several kinds of dangers and preventive measures	Work permission during general maintenance works	Video: Visual control and maneuvering
Zero – accidents activities	Video: 5S´s (Basic)	Video: Visual control: apparatus & quality
Human characteristics	Minor maintenance jobs performed by operators	Forming & Training Part I
	Video: Minor maintenance jobs performed by operators	Video: Accidents related to procedures

1.4 Phase-4 (2nd February – 26th February 1999) (2/4)

SAFETY COMMON	PROCESS SAFETY	MAINTENANCE SAFETY
Accident prevention	Increasing reliability in process units (Part I)	Video: Visual control & safety
Safety & Health topics	Examples of Accidents and incidents in Japan	Safety and total productive maintenance
Safety at work activities	Video: 5S´s activities	Video: Abunai I
Tool Box Meeting	Increasing reliability in process units (Part II)	Safety though the daily maintenance (Part II)
Small group activities		Video: Abunai II
		Video: Safe procedure for scaffolds

2. For Promoter

2.1 Phase-1 (March 1st to 5th /99)

SAFETY COMMON	PROCESS SAFETY	MAINTENANCE SAFETY
Japanese administration characteristics	Japan safety measures adoption	Japanese maintenance evolution
How Japanese companies work	Turn over	Introduction to Total productive maintenance
Feeling danger experience "ESP".	Patrol	Introduction to autonomous maintenance
Why the Japanese safety has been improved	Minor maintenance jobs performed by the operators	Introduction to Toolbox meeting
Review of the KYK activity	Morning assembly	KYK Activity using photographs
		VIDEO: Introduction to Total productive maintenance
		RIAMA TODAY

2.2 Phase-2 (August 2nd to 13th /1999)

SAFETY COMMON	PROCESS SAFETY	MAINTENANCE SAFETY
Safety administration organization	Properties and handling hazardous materials, dangers of water, steam and air, and static electricity	Work permission procedure used in the RIAMA
Promoter responsibility (unique point lesson)	Video: static electricity	Introduction and activity for the "standard instruction format"
Video: "5S´s".	Video: Petroleum	Education and training system
		Introduction and activity "unique point lesson"
		Video: Toolbox meeting in the RIAMA, Procedure for a safe job, Accident that happened in the U-13 unit

2.3 Phase-3 (January 31st - February 11th /00) (3/4)

SAFETY COMMON	PROCESS SAFETY	MAINTENANCE SAFETY
Promoters responsibility (unique point lesson)	Permission within operation jobs	Introduction to safety standards
KYK personal	Work permission during a general maintenance job	Japanese general standard activity for workers
Job accident prevention "Human error"	Video: 5S's (basic)	General considerations about static electricity
"Zero Accident" campaign		
Accident cases / how to observe safety rules (small group activities)		Conclusions
Accident analysis (cause - effect method)		Video: Petroleum and its dangers, ABUNAI 1, ABUNAI 2, Static electricity

2.4 Phase-4 (July 31st – August 11th /00)

SAFETY COMMON	PROCESS SAFETY	MAINTENANCE SAFETY
Promoter responsibility (unique point lesson)	Increasing of reliability of process units	Safety in the continuous maintenance
Accident cases / how to observe safety rules (small group activities)	Japanese accident examples	Small groups activity
Review of safety activities, HAD, KYK, ESP, 5S's, MORNING ASSEMBLY, RCH, ETC.	Video: 5S's activities	Morning assembly reinforcement
		Toolbox meeting reinforcement
		Construction scale of the Japanese standard procedure
		Video: Visual Control – General look and storage; Visual Control - Equipment and safety

3. For Worker

3.1 Phase-1 (March 1st to July 2nd /99)

SAFETY COMMON	PROCESS SAFETY	MAINTENANCE SAFETY
Feeling danger experience	Japanese Safety Measures Adoption	Japanese Maintenance Evolution
	Turn over	Introduction to TPM
	Patrol	Introduction to Autonomous Maintenance
	Minor maintenance jobs by operators	Introduction to Tool Box Meeting
	Morning assembly	KYK activity with photographs
	Video: A Japanese operator working day, water purge, steam purge, installing a pressure gauge	Video: Introduction to TPM
		RIAMA TODAY

3.2 Phase-2 (August 16th – December 7th /99) (4/4)

SAFETY COMMON	PROCESS SAFETY	MAINTENANCE SAFETY
5S's activities (Video program)	Properties and handling of hazardous materials, dangers of water, steam, air & static electricity	Work permission procedure used in the RIAMA
	Video: Petroleum	Introduction and "standard instruction format" activity
	Video: Static electricity	Education & Training System
		"Unique point lesson" Introduction and Activity
		Video: ToolBox Meeting in the RIAMA, Safe job procedure, U -13 accident

3.3 Phase-3 (February 14th - June 26th /00)

SAFETY COMMON	PROCESS SAFETY	MAINTENANCE SAFETY
Prevent personal accidents "Human Errors"	Work permissions during operation	Introduction to Safety Standards
"Zero Accidents" campaign	Work permission within a general maintenance work	Standard Japanese General Activity for Workers
Personal APP	Video: 5S's (Basic)	General considerations about Static Electricity
Accident cases / how to observe safety rules (small activities group)		Conclusions
		Video: Hazards of petroleum, ABUNAI 1, ABUNAI 2, Static Electricity

3.4 Phase-4 (August 14th – December 5th /00)

SAFETY COMMON	PROCESS SAFETY	MAINTENANCE SAFETY
Accident cases / how to observe safety rules (small group activities) Review of safety activities	Increasing reliability of process units	Safety in the continuous maintenance
	Accidents and incidents examples in Japan	Small groups activities
	Video: 5S's activities	Reinforcement of morning assembly
		Reinforcement of tool box meeting
		Construction Scale of the Japanese standard procedure
		Video: Visual Control – General look and storage; Visual Control - equipment and safety

TRAINING RECORD

Oct.99

		1997						1998												1999												No. of person	%	Passing Test
		7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12			
Technical transfer to counterparts																																		
Introduction course to CDD members	6 Days																															18	100	
Safety Intensive Course (HAD & APP)	1Day															(5/18~8/10)																4,712	100	
(HAD & APP)																																		
Safety Common Course																																		
For Engineers (Phase-1)	1Day																			(8/31~10/16)												316	95	86
(Phase-2)	1Day																			(10/19~11/12)												324	98	78
(Phase-3)	1Day																			(11/16~12/11)												304	92	94
(Phase-4)	1Day																				(2/2~2/28)											300	90	93
For Workers (Phase-1)	0.5Day																									(3/9~7/2)						3,489	98	96
(Phase-2)	0.5Day																																	
(Phase-3)	0.5Day																											(8/16~						
(Phase-4)	0.5Day																																	
Process Safety Course																																		
For Engineers (Phase-1)	1Day																			(8/31~10/16)												107	91	95
(Phase-2)	1Day																			(10/19~12/11)												128	108	100
(Phase-3)	1Day																			(11/16~12/11)												108	92	100
(Phase-4)	1Day																				(2/2~2/28)											99	84	94
For Workers (Phase-1)	0.5Day																									(3/9~7/2)						1,481	101	96
(Phase-2)	0.5Day																																	
(Phase-3)	0.5Day																											(8/16~						
(Phase-4)	0.5Day																																	
Maintenance Safety Course																																		
For Engineers (Phase-1)	1Day																			(8/31~10/16)												124	91	95
(Phase-2)	1Day																			(10/19~12/11)												119	95	100
(Phase-3)	1Day																			(11/16~12/11)												95	76	100
(Phase-4)	1Day																				(2/2~2/28)											103	82	100
For Workers (Phase-1)	0.5Day																									(3/9~7/2)						2,083	88.2	100
(Phase-2)	0.5Day																																	
(Phase-3)	0.5Day																											(8/16~						
(Phase-4)	0.5Day																																	
For Safety Promoters	1Day																					(3/2~3/8)						(8/2~8/13)				243	93	

Annex 10

Training Record by CIDESI

End of November

Course	Date	Number of Attendant	Examination
Ultrasonic Level-1	May 10 to 14, 1999	15	12
Radiograph Level-1	July 7 to 11, 1999	16	16
Ultrasonic Level-2	Aug.2 to 6, 1999	8	8
Magnetic Particles Level-1	Nov. 22 to 29, 1999	8	8
Magnetic Particles Level-2	Nov. 22 to 29, 1999	8	8

Annex 11

Training Record by Short Term Expert

End of November

	1997						1998												1999												Remarks
	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Maintenance & Inspection Management	———			(7/10~10/8)																											Mr. Utaro Kakiura
Non-destructive Inspection Technology									—	—		(3/12~5/9)																			Mr. Sanshiro Kimoto
Inspection Technology of Corrosion																					———		(3/11~5/5)								Mr. Toru Kato
Non-destructive Inspection for H-Oil																							(9/30~11/27)					———			Mr. Akira Tamura
Hazard Evaluation Technology																															

Annex 12

Training Record other than RIAMA

End of November

1. PEMEX Refineries

1.1 Superintendents and Managers from 5 refineries (31 personnel)
Safety common course including HAD and KYK
From 13th July 1998 to 29th July 1998

1.2 Engineers from 5 refineries (27 personnel)
HAD and KYK
12th and 13th Nov. 1998

1.3 Engineers from Minatitlan refinery (19 personnel)
HAD and KYK
From 21st Jan. to 8th Feb. 1999

1.4 Workers from Minatitlan refinery (32 Personnel)
Safety Common course (Phase-1)
15th and 22nd Feb. 1999, 15th and 22nd Mar. 1999, 12th Apr. 1999

1.5 Engineers and Workers from Maritime Terminals (23 Personnel)
Safety Administration, KYK, HAD
From 14 th to 19 th Oct. 1999

2. Other than PEMEX

2.1 Mexican Institute of Chemical Engineers in Guanajuato (45 personnel)
HAD, KYK, Hiyari-Hatto and 5S
27th Oct. 1998

2.2 Mexican Institute of Chemical Engineers in Tula (30 personnel)
HAD and KYK
30th July 1999

2.3 Health Department in Salamanca Municipality (35 personnel)
Introduction of QC
20th Aug. 1999

2.4 Health Department in Salamanca Municipality
Audit of 5S
9th Sep. 1999

2.5 Health Department in Salamanca Municipality (32 personnel)
Site activities of 5S
20th Sep. 1999

2.6 Technological Education Center No.115 (CETMEJA), CELAYA (120 Personnel)
General Safety
05th Oct. 1999

Annex 13

List of Japanese Experts

1. LONG TERM EXPERTS

Chief Advisor:		
	Ing. Ryuzo Furukawazono	5 Dec. 1996 ~ 4 Feb. 1999
	Ing. Katsumi Imanishi	18 Jan. 1999 ~
Coordinator:		
	Ing. Hiroshi Isaki	5 Dec. 1996 ~ 4 Dec. 1998
	Ing. Tosihiro Nozawa	19 Nov. 1998 ~
Safety Administration:		
	Ing. Hajime Mori	16 Jan. 1997 ~ 15 Jan. 1999
	Ing. Eizo Uegaki	16 Jan. 1997 ~ 15 July 1999
	Ing. Noriyuki Tsunetsugu	7 Jan. 1999 ~
	Ing. Akiteru Tamai	28 June 1999 ~
Maintenance Safety:		
	Ing. Hideyuki Iwasato	16 Jan. 1997 ~ 15 Jan. 1999
	Ing. Minoru Kuwahara	7 Jan. 1999 ~
Process Safety:		
	Ing. Toru Moriyama	16 Jan. 1997 ~ 15 July 1999
	Ing. Norio Watanabe	28 June 1999 ~

2. SHORT TERM EXPERT

Maintenance and Inspection Management		
	Ing. Utaro Kakiura	10 July 1997 ~ 8 Oct. 1997
Non-destructive Inspection Technology		
	Ing. Sanshiro Kimoto	12 Mar. 1998 ~ 9 May 1998
Inspection Technology for Corrosion		
	Ing. Toru Kato	11 Mar. 1999 ~ 5 May 1999
Non-destructive Inspection Technology for H-Oil Plant		
	Ing. Akira Tamura	30 Sep. 1999 ~ 27 Nov. 1999
(Hazard Evaluation Technology		
	Two(2) Experts	Jan. 2000 ~ Apr. 2000)

LIST OF MACHINERY, EQUIPMENT AND MATERIALS PROVIDED BY THE JAPANESE SIDE

1. LIST OF JAPANESE FISCAL YEAR 1996

	Name of equipment	Number of unit
1.-	Digital Video Disc	1
2.-	TV - Sets	6
3.-	Video - Sets	6
4.-	Video Editor	1
5.-	Personal Computers	8
6.-	Note-type Personal Computer	1
7.-	Laser Printers (Black and White)	3
8.-	Color Printer (Ink - jet type)	1
9.-	Copy Machines	2
10.-	Facsimile	1
11.-	Vehicle	1
12.-	Electric White Board	1
13.-	OHPs	7
14.-	Multi Media Projector	1
15.-	Video Cameras	2
16.-	Screens for OHP	7
17.-	Laser pointers	14

2. LIST OF JAPANESE FISCAL YEAR 1997

2.1 Safety:

1.- Chromatograph for Environmental Measurements with complementary equipment (Five Pump Gilair - 5" Programmable)

2.- Sonometer

3.- Fire Laboratory Kit

2.2 Inspection:

4.- Ultrasonic equipment for flaw detection with complementary equipment (Kraut -Kramer Branson Model USN-52)

5.- Equipment for flaw detection in steel pipelines (Model Steel-Test 1000)

6.- "ZETEC" Equipment for Electromagnetic inspection (Model MIZ 40-RFT)

7.- Ultrasonic equipment for thickness measurement with complementary equipment (Kraut - Kramer Branson Model USN-52)

8.- Magnaflux equipment for magnetic particles inspection

9.- Ultrasonic equipment for flaw detection (Kraut - Kramer Branson Model USN-52)

10.- Texas nuclear equipment for alloy analyzer (Texas Nuclear Model 9277)

11.- "ZETEC" equipment for Electromagnetic Inspection (Model MIZ 40 -A)

2.3 Others:

12.- Books (Safety, Process, Maintenance and Inspection)

13.- Videotapes (Safety, Process, Maintenance and Inspection)

3. LIST OF JAPANESE FISCAL YEAR 1998

	Name of equipment	**Number of Unit**
3.1 Safety, Process and Maintenance:		
1.-	Books (Safety, Process, Maintenance and Inspection)	
2.-	Videotapes (Safety, Process and Maintenance)	
3.2 Inspection:		
3.-	Standard Test Pieces	
	for UT	6
	for MT	8
	for Liquid Penetration (Aluminum Comparison)	4

4. LIST OF JAPANESE FISCAL YEAR 1999

4.1 Safety:

1.- Gas Dispersion and Fire Simulation (Software) (Safer System - TRACE)
(Including Fire and Explosion, Release Rate Estimation, Infiltration and Tool Kit Capabilities)

Annex 15

List of Counterparts Trained in Japan

End of November

1. Japanese Fiscal Year 1996
   Safety Administration and Maintenance
   Ing. Guillermo Camacho Uriarte — 3 Oct. 1996 ~ 17 Oct. 1996

2. Japanese Fiscal Year 1997
   Safety Administration
   Ing. Jose Renteria Soto — 24 Sep. 1997 ~ 20 Oct. 1997
   Safety Management Technology
   Ing. Rafael Alvarez Martinez — 24 Sep. 1997 ~ 20 Oct. 1997
   Maintenance Safety
   Ing. Victor Manuel Munguia Zuniga — 24 Sep. 1997 ~ 20 Oct. 1997

3. Japanese Fiscal Year 1998
   Safety Administration
   Ing. Jesus Manuel Almanza Torres — 1 Apr. 1998 ~ 2 May 1998
   Ing. Carlos Rafael Cuevas Zaldo — 1 Apr. 1998 ~ 2 May 1998
   Ing. Candelario E. Cu Gutierrez — 1 Apr. 1998 ~ 2 May 1998
   Safety Management
   Ing. Manuel Melo Lopez — 10 Mar. 1999 ~ 31 Mar. 1999
   Ing. Armando Marin Marin — 10 Mar. 1999 ~ 31 Mar. 1999

4. Japanese Fiscal Year 1999
   Maintenance Safety
   Ing. Fernando Martinez Fernandez — 30 June 1999 ~ 27 July 1999
   Process Safety
   Ing. Sergio Gonzalez Beltran — 30 June 1999 ~ 27 July 1999
   (One (1) Counterpart — Feb. 2000 ~ Mar. 2000)
   Safety Management
   Ing. Miguel Tame Dominguez — 26 Sep. 1999 ~ 9 Oct. 1999
   Inspection Technology
   (One (1) Counterpart — Feb. 2000 ~ Mar. 2000)

DRAFT OF PROJECT DESIGN MATRIX (1/2) (Ver-3)

Appendix 2

Detailed Contents of Narrative Summary	Indicators	Means of Verification	Important assumption
(Overall Goal) Productivity of Salamanca Refinery is improved.	Unplanned unit shut-down frequency due to incidents originated by human error decreases	Daily reports of refinery operation and/or operation records for each processing unit	• There will be no serious changes in the social and economic situation affecting operations of the refinery • The policy of PEMEX's top management will not change
(Project Purpose) Safety Level of Salamanca Refinery is improved	Safety Level of Salamanca Refinery is improved. (For reference) Total number of accidents, injury frequency rate and injury severity rate	Check list Accidents record	• Regulations on the environmental and energy saving enforcement will not deteriorate productivity
(Outputs) 0. The organization and management system of the Project is established	0-1 The number of counterparts allocation is to be based upon the Minutes of Discussion in principal (confirmed by each year) 0-2 The authority and responsibility of the project organization are clearly defined	0-1 Allocation record of counterparts 0-2 Record of CES	• Accidents due to the causes other than human error do not affect the safety level • Maintenance and repair works keep the present job level
1. Safety knowledge is acquired by all the employees	1-1 Completion ratio of training courses is over 90%. 1-2 Test passing (over 60%) ratio after safety training is over 80%. 1-3 Qualified inspector's ratio of certification ASNT level-2 is over 60%.	1-1 Training records of CES 1-2 Result of achievement on training 1-3 List of certification	
2. Labor behavior is improved	2-1 Labor behavior is improved		
3. All the employees take preventive measures by analyzing potential hazards at work	3-1 KYK implementation ratio is over 80% 3-2 HAD implementation ratio is over 80% 3-3 Number of Hiyari-Hatto reported by employees increase every year. 1 per person in 2001 3-4 5S implementation ratio is over 80%	3-1~3-4 Implementation record And audit	
4. All the employees observe the procedures and the regulations	4-1 Using ratio of helmet and chinstrap is over 80% 4-2 Using ratio of the attached documents of work permission is over 80% 4-3 Using ratio of the check lists of necessary facility check item is over 80%	4-1~4-3 Patrol report	
5. Recognition of unsafe conditions is improved	5-1 The number of unsafe conditions pointed out is decreased. 5-2 Marks and identifications to prevent misunderstanding are improved	5-1 Report of pointed out 5-2 Number of improved sections	
6. Safety information is utilized in each section	6-1 Holding ratio of meeting in each section is over 80 %. 6-2 Proposals is presented in each section	6-1 Meeting report 6-2 Report of proposals	
7. Safety activity plan is implemented in each section	7-1 Safety activity plan of each section is presented to refinery manager 7-2 Safety activity plan is implemented in each section.	7-1 Safety activity plan 7-2 Evaluation report / Audit	

DRAFT OF PROJECT DESIGN MATRIX (2/2) (Ver-3)

Detailed Contents of Narrative Summary		Input		Important assumptions
(Outputs) 0. The organization and Management system of the Project is established	(Activities) 0-1 Allocate counterparts and administrative staff 0-2 Stipulate duties of functions 0-3 Install the organization for the decision and the meeting	Japanese Side Dispatch of experts Long term • Chief Advisor • Project coordinator • Safety administration • Maintenance safety • Process safety Short term • Technical inspection and others • Acceptance of C/Ps training in Japan Provision of equipment	Mexican Side • Space, building and facilities • Assignment of counterparts • Equipment and materials • Local cost	• Mexican counterparts continue to work for the Project • Training courses are not interrupted by ad hoc operation in Salamanca Refinery • Salamanca Refinery allocate appropriate budget necessary for application of Japanese method to the Refinery
0. Safety knowledge is acquired by all the employees	1-1 Transfer necessary knowledge for conducting training to counterparts. 1-2 Carry out training of safety common course including Japanese safety method 1-3 Carry out training of process safety course 1-4 Carry out training of maintenance safety course 1-5 Carry out training of management skill-up course 1-6 Carry out training of safety advanced course 1-7 Carry out training on inspection technology for inspectors 1-8 Carry out training on HAZOP and accident analysis 1-9 Improve existing safety training system and its contents			Pre-conditions • The Mexican Government supports the Project • PEMEX recognizes the importance of safety training program • Salamanca Refinery cooperates extensively with this project.
2. Labor behavior is improved	2-1 Carry out training of labor behavior			
3. All the employees take preventive measures by analyzing potential hazards at work	3-1 Implement KYK 3-2 Implement HAD (Calling with a pointed finger) 3-3 Implement Hiyari-Hatto 3-4 Implement 5S			
4. All the employees observe the procedures and the regulations	4-1 Conduct to follow the attached documents in work permission 4-2 Conduct to follow the safety regulation for maintenance work and the maintenance work procedure. 4-3 Conduct to follow the safety regulation for operation and operation manual			
5. Recognition of unsafe conditions is improved	5-1 Decrease unsafe conditions 5-2 Improve the present marks and identifications to prevent misunderstanding			
6. The safety information is utilized in each section	6-1 Hold morning meeting, TBM and turnover meeting. 6-2 Stimulate to present proposals on safety matter			
7. Safety activity plan is implemented in each section	7-1 Assign safety engineers and safety promoters in each Section 7-2 Clarify the duties and responsibilities of each concerned personnel in each section 7-3 Stimulate to make activity plan 7-4 Implement the activity			

Draft of Plan of Operations for whole period (Ver-2)

Appendix 3

	Out Put		Activities	Breakdown of Activities	Schedule	In Charge
0	The organization and management system of the Project is established	0-1	Allocate counterparts and administrative staff			CES
		0-2	Stipulate duties of function			CES
		0-3	Install the organization for the decision and the meeting			CES
1.	Safety knowledge is acquired by all the employees	1-1	Transfer necessary knowledge for conducting training to counterparts.	1. Conducting training		EXPT
		1-2	Carry out training of safety common course including Japanese Safety method	1. Prepare the training material 2. Training to all the employees		S
		1-3	Carry out training of process safety course	1. Prepare the training material 2. Training to all the employees		P
		1-4	Carry out training of maintenance safety source.	1. Prepare the training material 2. Training to all the employees		M
		1-5	Carry out training of management skill-up course	1. Prepare the training material 2. Training to engineers		S
		1-6	Carry out training of safety advanced course	1. Prepare the training material 2. Training to engineers		S
		1-7	Carry out training on inspection technology for inspectors	1. Prepare & purchase the equipment 2. Utilize the equipment 3. Refresh training course 4. Special course for corrosion 5. Special course for UT		S
		1-8	Carry out training on HAZOP and accident analysis	1. Prepare the training 2. Training to engineers		S
		1-9	Improve existing safety training system and its contents	1. Investigate existing training system and its contents 2. Review and study 3. Recommend		S S L
2	Labor behavior is improved	2-1	Carry out training on labor behavior	1. Prepare the training material 2. Training to all employees		S
3	All the employees take preventive measures by analyzing potential hazards at work	3-1	Implement-KYK	1. Preparation for site activities 2. Introduce to the site 3. Consolidate 4. Evaluate		S RIAMA RIAMA RIAMA
		3-2	Implement HAD (calling with a pointed finger)	1. Preparation for site activities 2. Introduce to the site 3. Consolidate 4. Evaluate		S RIAMA RIAMA RIAMA

	Out Put		Activities	Breakdown of Activities	Schedule 96 10	97 1 4 7 10	98 1 4 7 10	99 1 4 7 10	00 1 4 7 10	01 1 4 7 10	In Charge
		3-3	Implement Hiyari-Hatto	1. Preparation for site activities							S
				2. Introduce to the site							RIAMA
				3. Consolidate							RIAMA
				4. Evaluate							RIAMA
		3-4	Implement 5S	1. Preparation for site activities							S
				2. Introduce to the site							RIAMA
				3. Consolidate							RIAMA
				4. Evaluate							RIAMA
4	All the employees observe the procedures and the regulations	4-1	Conduct to follow the attached documents in work permission	1. Investigate the actual situation and prepare the example of documents.							PM
				2. Prepare the additional document							RIAMA
				3. Introduce to the site							RIAMA
				4. Follow-up							RIAMA
		4-2	Conduct to follow the safety regulation for maintenance and maintenance work procedure	1. Investigate the actual situation and prepare the example of handbook, checklist etc.							M
				2. Recommend on the procedure etc. or point out the default of rules							M
				3. Prepare the handbook, checklist etc. and review the procedure etc.							RIAMA
				4. Introduce to the site							RIAMA
				5. Follow up							RIAMA
		4-3	Conduct to follow the safety regulation for operation and operation manual	1. Investigate the actual situation and prepare the example of handbook, checklist etc.							P
				2.Recommend on how to review the manuals etc.							P
				3. Prepare the handbook, checklist etc. and review the manuals etc.							RIAMA
				4. Introduce to the site							RIAMA
				5. Follow-up							RIAMA
5	Recognition of unsafe conditions is improved	5-1	Decrease unsafe conditions	1. Fix the survey point							P
				2. Survey							P
				3. Recommend							L
				4. Carry out measure							RIAMA
		5-2	Improve the present marks and identifications to prevent misunderstanding	1. Fix the content							P
				2. Review of the existing standards							P
				3. Recommend							L
				4. Introduce to the site							RIAMA

Appendix 4

ATTENDANCE AT THE DISCUSSIONS

I.- MEXICAN SIDE:

(1) PEMEX HEAD OFFICES

Mr. Francisco Delgado Cortés	Production Subdirector of PEMEX REFINACION
Mr. Emilio Díaz Francés	Industrial Safety Manager
Mr. Gerardo Acevedo Sobrado	Industrial and Physical Safety Sub Manager
Mr. Miguel Mendoza Gutiérrez	Industrial Safety Coordinator

(2) SALAMANCA REFINERY

Mr. Miguel Tame Dominguez	Salamanca Refinery Manager
Mr. Manuel Melo López	Production Unit Chief
Mr. Armando Marín Marín	Evaluation and Planning Unit Chief
Mr. Eduardo Jasso Cruz	Human Resources Unit Chief
Mr. José Luis Torres Martínez	Technical Inspection and Industrial Safety Superintendent
Mr. Alvaro Muro González	Maintenance Superintendent
Mr. Benjamín Guerrero Romero	Operation Superintendent
Mr. Antonio Alvarez Moreno	Technical Inspection and Industrial Safety Coordinator

(3) SAFETY TRAINING CENTER

Mr. Jesús Manuel Almanza Torres	Safety Training Center Manager
Mr. Carlos Rafaél Cuevas Zaldo	Safety Group Counterpart
Mr. Candelario Enrique Cu Gutiérrez	Inspection Group Counterpart
Mr. Sergio González Beltrán	Process group Counterpart
Mr. Fernando Martínez Fernández	Maintenance Counterpart

II.- JAPANESE SIDE:

(1) ADVISORY TEAM

Mr. Yuji Hosaya	Leader
Mr. Fumio Tanaka	Member (Safety Administration)
Mr. Shigeo Konno	Member (Technical Transfer Planing)
Ms. Yukari Saito	Member (Project Management)

(2) JAPANESE EXPERTS

Mr. Katsumi Imanishi	Chief Adviser
Mr. Toshihiro Nozawa	Coordinator
Mr. Noriyuki Tsunetsugu	Safety Administration Expert
Mr. Akiteru Tamai	Safety Administration Expert
Mr. Norio Watanabe	Process Safety Expert
Mr. Minoru Kuwahara	Maintenance Safety Expert

(3) JICA MEXICO OFFICE

Mr. Saburo Yamaguchi	Resident Representative
Mr. Hidemitsu Sakurai	Deputy Resident Representative