

# 添付資料 IV

活動実績資料

## (1) 活動状況写真

Discussion with the C/Ps for examination & inspection



Whole Discussion



Whole Discussion



Individual Discussion



Individual Discussion



Discussion at site



Discussion at site

Discussion with the C/Ps for examination & inspection



Whole Discussion

Whole Discussion



Individual Discussion

Individual Discussion



F/S Meeting with C/P

JICA Experts & DOE Staff

Discussion with C/P  
Interview with EDL



Discussion of the Activity Plan for the second phase  
(Jan.19,26, 2012)



Interview with EDL(TL & SS Dep. and Training Center (Feb.10, 2012)



Interview with EDL  
(Feb.13, 2012)

Equipment check at EDL Training Center  
(May 29, 2012)



Meeting with EDL TC members



Confirmation of equipment



Confirmation of equipment



Confirmation of equipment



Confirmation of equipment



Confirmation of equipment

Practice for Usage of Check Sheet in DL and Interview about HP and DL (Xiengkhouang PDEM)  
(Oct. 26, 2012)



Lecture



Lecture



Group Work



Group Work



Exercise



Interview

Field OJT



230kV Transmission Line around Nabong SS & Nam Ngum 1 PS  
(Nov.17, 2010)



Phonetong SS (Nov.29, 2010)

Nabong SS (Dec.6, 2010)



Nam Ngum 1 PS (Dec.6, 2010)

Nam Ngum 1 PS (Dec.6, 2010)



Field OJT



115kV Pakxan-Thakek-Pakbo Transmission Line Project (Feb.2-4, 2011)



Distribution Lines in Vientiane (Feb.17, 2011)



Theun-Hinboun PS Expansion Project (Feb.21-23, 2011)

Field OJT



Theun-Hinboun PS Expansion Project (Feb.21-23, 2011)



Nam Ngum 2 Hydropower Station (May18 – 20, 2011)



Nam Ngum 2 Hydropower Station (May18 – 20, 2011)

Field OJT



Distribution Line for Vientiane (May25-26, 2011)



Nam Ngum 1 Hydropower Station (Jul. 14, 2011)



Nam Ngum 1 Hydropower Station (Jul. 14, 2011)

Inspection Prior to First Impounding for THXP Hydropower Project  
(Jun. 14 – 16, 2011)



Meeting



Retaining dike



Dam site



Dam site



In the gallery



Closing meeting

Field OJT and examination



Training for examination of Naxaythong equipment layout and drawings (Aug. 18-19, 2011)



Training for examination of Nam Ngum 1 test log(Aug. 18-19, 2011)

OJT (DL) (Nov. 18, 2011)



OJT (DL) (Nov. 18, 2011)

Discussion(DL) (Nov. 18, 2011)

Inspection before COD for Nam Nhon Hydropower Project

(Sep. 24 – 27, 2011)



Meeting



Meeting at Bokeo PDEM



Powerhouse



Intake dam



Forebay



Tailrace

Accident Investigation (landslides near transmission towers for Nam Theun 2 Hydropower Station)  
(Nov. 7 – 9, 2011)



Site



Site



Meeting



Meeting



Site survey



Site survey

Examination and inspection at Nam Ngum 5 Hydro Power Station  
(Feb.6-9, 2012)



Meeting room



Presentation by SINOHYDRO



Explanation of LETPS procedure



Examination



Powerhouse facilities



Site inspection for powerhouse



Examination and inspection at Nam Ngum 5 Hydro Power Station

(Feb.6-9, 2012)



Transmission line facilities



Site inspection for transmission line



Dam facilities



Site inspection for dam



Inquiry to SYNOHYDRO



Wrap-up meeting

Field OJT of DL field  
(Feb.28, 2012)



Field OJT

Field OJT



Field OJT

Field OJT



Field OJT

Wrap-up meeting

Field OJT at Thanaleng Substation

(Feb.29, 2012)



Previous Discussion at DOE office



Field OJT

Field OJT



Field OJT

Field OJT

Inspection of Dam Foundation at Nam Luok Dam and Nam Ken Dam for Hongsa Lignite Power Station (May 23-26, 2012)



Presentation about the project from HPC



Explanation from HPC at Nam Luok Dam



Checking the rock condition at Nam Luok Dam



Site inspection at Nam Ken Dam



Grouting works at Nam Ken Dam



Discussing the contents of MM with HPC

Re-inspection prior to first impounding at Nam Ngum5 Hydropower Station  
(Jun. 4-6, 2012)



Reviewing previous MM



Confirming the progress of work



OJT at switchyard



Arch-type dam



Explanation about dam deformation



Installing spillway gates

Field OJT at Nam Mang 3 Hydropower Station  
(May 31, 2012)



OJT for transmission line facilities



OJT for power facilities



OJT for substation facilities



Questionnaires to EDL-Gen



Questionnaires to EDL-Gen



Questionnaires to EDL-Gen

Seminar and OJT in Vientiane Province  
(Jul.2-3, 2012)



Seminar by new C/P



Application of Checklist by PDEM



OJT for Examination by Experienced C/P



OJT for Examination by New C/P



OJT for Site Inspection (Meter check)



Discussion after Site Inspection

Pre-seminar on the Promotion of LEPTS Understanding (Vientiane)

(Feb. 25, 2011)



Opening



Opening



Presentation



Presentation



Group Discussion and Whole Discussion





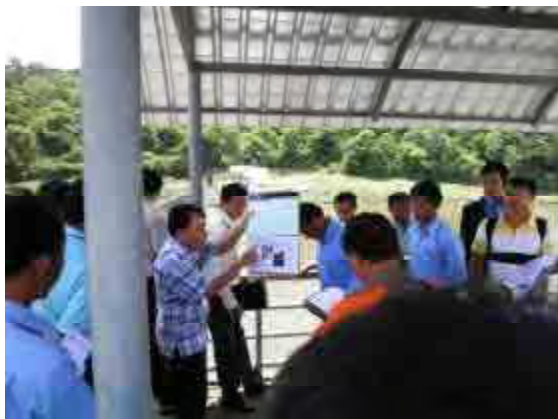
1st Seminar on the Promotion of LEPTS Understanding (Champasak Province)  
(Jun. 6-9, 2011)



Opening



Lecture



Field training for hydro



Field training for distribution



Question and answer



Certificate of participation

2nd Seminar on the Promotion of LEPTS Understanding (Xiengkhouang Province)

(Oct. 22-25, 2012)



Opening Remarks



Group Photo



Lecture (Electricity Law, LEPTS)



OJT at Nam Ka 2



OJT at Phongsavanh SS



Award of a Certificate

3rd Seminar on the Promotion of LEPTS Understanding (Savannakhet Province)

(Jan. 22-24, 2013)



Opening Remarks



Group Photo



Lecture (Electricity Law, LEPTS)



Lecture (HE)



Lecture (DL)



Award of a Certificate

1st Counterpart training in Japan (Chubu EPCo. and Kansai EPCo., JAPAN)

(Sep.1-13, 2011)



OJT at Tokuyama Dam



OJT at Tokuyama Dam



OJT (Sakurai line construction site)



OJT (Amagase Hydropower station)



Field OJT (DL)



Group Photo

1st Counterpart training in Japan (Chubu EPCo. and Kansai EPCo., JAPAN)

(Sep.1-13, 2011)



Lecture



Lecture



OJT at Koshido Dam Control office



Human Resource Development Center



Individual Discussion



OJT at Kitakatsuragi SS

2nd Counterpart Training (Chubu EPCo. and Kansai EPCo., JAPAN)

(Sep. 6-19, 2012)



Lecture



Group Photo



OJT at small dam



OJT at customer service center



OJT at hydropower station



OJT at TL construction site

2nd Counterpart Training (Chubu EPCo. and Kansai EPCo., JAPAN)

(Sep. 6-19, 2012)



Q&A at Nishidaira Dam Control Office



OJT at Koshido Dam Control Office



Individual Discussion



Individual Discussion( Uji PS)



OJT at Minami Himeji SS



OJT at Yoko-oji Ogura TL

1st JCC Meeting (DOE conference room)

(Nov. 4, 2010)



Opening



Group Photo



Presentation



Discussion



Discussion



2nd JCC Meeting (DOE conference room)  
( Nov.14, 2011)



Group Photo



Opening



Presentation



Discussion

3rd JCC Meeting (Conference room on the sixth floor of MEM building)

(Dec. 4, 2012)



Opening remarks



Presentation



Discussion

## (2) 現場検査および OJT

## 現場検査記録

プロジェクト:	115 kV Paksan-Thakhek-Pakbo 送電線建設工事
区分:	OJT
日付:	2011年2月2日～4日
参加者:	
DOE:	Ms. Santisouk PHIMPHACHANH (送電)、 Dr. Xayphone BOUNSOU (送電)
専門家:	三浦総括 (水土木)、丸岡専門家 (送電)
活動内容:	<ul style="list-style-type: none"><li>• 事前に準備したチェックシートや手引書 (ドラフト) を用いて、目視による模擬検査を実施した。</li><li>• 建設現場 (基礎工事、架線工事) にも訪れ、建設中における検査の着眼点についても指導を実施した。</li></ul>
所見:	<ul style="list-style-type: none"><li>• 事前に事業者から設計資料、設備台帳、図面等の書類の情報提供を受け、検査では書類と現場が一致していることを確認する必要がある。</li><li>• 現場検査のチェックシートや事例集 (ドラフト) は、OJT の都度 C/P の意見を取り入れ、今後も定期的に見直す必要があった。専門家はそれらを、プロジェクト期間を通して、改善を図った。</li></ul>

## 現場検査記録

プロジェクト:	Theun-Hinboun 水力発電所拡張工事 (THXP)
区分:	OJT
日付:	2011年2月21日～23日
参加者:	
DOE:	Ms.Santisouk PHIMPHACHANH (送電)、Dr. Phoukhong SENGVILAY (水土木)、Mr. Va YATHOTU (水力電気および変電)
専門家:	川上副総括 (水土木)、藤田専門家 (水力電気)、木下専門家 (水力電気)、中居専門家 (変電)
活動内容:	<ul style="list-style-type: none"> <li>• 事前に準備したチェックシートを用いて、ダム・発電所・変電所・送電線などの検査手法の確認を実施した。</li> <li>• Theun-Hinboun 水力発電所は7月に初期湛水を控えており、事業者と検査の時期および事前資料の内容確認を実施した。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>• 事前に事業者から設計資料や図面等の情報提供が無いと、検査の実施に大きな妨げとなるのはっきりした。専門家は、検査前に書類を受け取る重要性をC/Pに伝えた。</li> <li>• 現場検査のチェックシートはより現実的なものに見直す必要があった。プロジェクト期間を通して、専門家とC/Pはチェックシートを見直した。</li> <li>• 実際の湛水検査に向けて準備を進めた。</li> </ul>

## 現場検査記録

プロジェクト:	配電設備 (Vientiane Capital) (既設)
区分:	OJT
日付:	2011年2月17日
参加者:	
DOE:	Mr. Thammanoune (配電)、Mr. Phouxay (配電)
専門家:	和田専門家 (配電)、小野澤専門家 (研修強化)
活動内容:	<ul style="list-style-type: none"><li>• Vientiane Capitalにおいて、配電設備の審査・検査のOJTが行われた。本OJTでは、チェックリスト案が現場検査で用いられた。</li><li>• OJT後には、現場で見つけたポイントを共有するために議論が行われ、チェックリストの使用方法の確認が行われた。</li></ul>
所見:	<ul style="list-style-type: none"><li>• チェックリストを用いて、C/Pは電線と他の構造物間の離隔不足等、LEPTSに適合していない箇所を見つけた。</li><li>• 確認会議後、議論の結果に基づき、チェックリストが修正された。</li></ul>

## 現場検査記録

プロジェクト:	Nam Ngum 2 (NN2) 水力発電所 (既設)
区分:	OJT
日付:	2011年5月18日～20日
参加者:	
DOE:	Dr. Phoukhong SENGVILAY (水土木)、Mr. Va YATHOTU (水電気)
専門家:	三浦総括 (水土木)、木下専門家 (水電気)、澤井専門家 (水土木補助)
活動内容:	<ul style="list-style-type: none"> <li>• 新設水力発電設備検査を意識した現場OJTとして、既設発電所の設備視察や書類確認を行った。</li> <li>• 設備視察を通じて各種設備や発電所運用に関する知識や理解を深めた。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>• NN2 (運開：2011年、出力：615MW) は全体的には良く管理されていたものの、Flood Management Ruleに関して放流時の意思決定フローが定められていないことが分かった (OJT完了後、NN2に対してフローの早期整備をDOEよりコメント)。C/PだけでなくIPP事業者に対してもLEPTS遵守に対する意識付けが求められる。</li> <li>• 今回のOJTに参加したC/Pについては、発電所設備や運用に対する知識がやや不足しているところもあった。実際の検査やOJTを通じて検査経験を積み、バランスのとれた検査官となるよう指導していく必要があった。専門家の援助により、プロジェクト終了までにはこれらの課題については、C/Pは理解できるようになってきた。</li> </ul>

## 現場検査記録

プロジェクト:	Vientiane 県配電設備 (1) (既設)
区分:	OJT
日付:	2011年5月25日～26日
参加者:	
DOE:	Mr. Thammanoune NAKHAVITH (配電)、Mr. Phouxay VIENGVIXAY (配電)
専門家:	三浦総括 (水土木)、小野澤専門家 (研修強化)、和田専門家 (配電)
活動内容:	<ul style="list-style-type: none"> <li>• DOEの指導能力向上を目的に、DOEが、PDEMやEDLに対して審査・検査に関する講義や既設設備および建設中の配電設備を使った技術指導を実施し、必要に応じて専門家がアシストした。</li> <li>• OJTを通して、DOE、PDEMおよびEDLの配電設備や検査・審査の流れについての知識・理解を深めた。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>• PDEMは、審査・検査の流れを十分に理解していなかった。マニュアルの普及を促進するとともに、審査・検査の流れについてはさらなる指導が必要であった。これらに対応するために、2012年7月2、3日の第2回セミナーにおいて、LEPTSおよびガイドラインがVientiane PDEMへ提供された。</li> <li>• C/Pによる講義は総じてスムーズに進んだが、受講者の質問から議論が始まり、講義が止まる場面があった。専門家は、講義中の時間管理の重要性についてC/Pへ指導した。</li> <li>• 建設中の配電設備は、大半は技術基準に適合していたが、高圧中圧間の離隔不足、変圧器の不適合な接地等、いくつかの指摘事項があった。C/Pが説明するまでPDEMがこれらの指摘事項に気がつかない場面があったため、PDEMのさらなる審査・検査技術の向上が必要であった。セミナー後、専門家は今後の追加研修の必要性をC/Pに説明を行った。C/Pはセミナーの重要性を認識し、2012年7月2、3日にVientiane県で第2回セミナーを開催した。</li> </ul>



## 現場検査記録

プロジェクト:	Theun Hinboun 水力発電所拡張工事 (THXP)
区分:	湛水前検査
日付:	2011年6月14日～16日
参加者:	
DOE:	Mr. Hatsady SYSOULATH (副局長)、Dr. Phoukhong SENGVILAY (水力土木)、 Ms. Santisouk PHIMPHACHANH (送電)
専門家:	川上副総括 (水力土木)、中居専門家 (変電)
活動内容:	<ul style="list-style-type: none"> <li>• THXPから申請 (Form5) を受け、DOEとしては正規な手続きを踏んだ初めての湛水前検査を実施した。検査後には両社で協議議事録 (M/M) に署名し、DOEは条件を付して湛水を認めるとの終了証を現地で授与した。</li> <li>• C/Pにとっては、検査手続きに理解を深めるとともに、事前申請書類の必要性やその内容、そしてチェックシートの現地での活用方法などの理解を深める大変良い機会となった。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>• ダムの一部が施工中で、洪水吐ゲートも湛水中に設置する (部分湛水) である旨の通知を事前に受けていたが、実際には取水口ゲートが設置されていない、監査廊下部の変位計やポンプが未設置、さらに湛水についての下流住民への周知が未実施であったので、それらが完了してから湛水を認めることとした。THXPも検査を受ける事業者として未熟である。</li> <li>• C/Pは、技術面の他にも事前準備の必要性、検査官としての心得や検査項目の精査、そして終了証署名などといった基本的な手続きの重要性を認識した。</li> </ul>

## 現場検査記録

プロジェクト:	Nam Ngum 1 (NN1) 水力発電所 (既設)
区分:	OJT
日付:	2011年7月14日
参加者:	
DOE:	Mr. Phouxay (配電)、Mr. Va (水力電気および変電)、Mr. Lair (水力土木および配電)
専門家:	木下専門家 (水力電気)、小野澤専門家 (研修強化)
活動内容:	<ul style="list-style-type: none"> <li>• 若手の電気および機械系C/Pに対して、既設NN1水力発電所 (運開: 1971年、出力: 155MW) においてOJTを実施した。</li> <li>• 特に、水力電気・変電分野のC/Pでは、チェックポイントの説明及び技術基準との適合良否判定について重点的に説明し、他分野のC/Pには、発電所・開閉所等に設置されている機器の理解 (名称、機能、動作等) を深めることを重点的に説明した。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>• NN1はLEPTS制定前に運開している発電所であるため、技術基準に適合していない箇所が散見され、実物と手引書を照らし合わせて良い事例か悪い事例かを確認しながらチェックできたため、有益なトレーニングを行うことができた。</li> <li>• 一方で、基本図面 (単線結線図、配管系統図、機器配置図) 等を事前に準備しておらず、事前の情報収集が不十分であった。専門家は、C/Pに現場に行く前に必要な情報を得て確認するようアドバイスした。</li> </ul>

## 現場検査記録

プロジェクト:	Nam Ngum 1 (NN1) 水力発電所 (既設) および Naxaython 変電所 (既設)
区分:	OJT
日付:	2011年8月18、19日
参加者:	
DOE:	Mr. Viengsay (水力電気)、Mr. Va (水力電気および変電)、Mr. Lair (水土木および配電)
専門家:	藤田専門家 (水力電気)
活動内容:	<ul style="list-style-type: none"> <li>• 水力電気および変電のC/Pとともに、NN1水力発電所、Naxaython230kV変電所において、竣工検査のシミュレーション訓練を実施した。</li> <li>• 検査結果についてC/Pと事後会議を行い、検査記録書の確認を行った。</li> <li>• 現地で技術基準の適合例と不適合例を写真とともに収集した。これらをもとにC/Pが絶縁強度、熱的強度の適合例として事例集を作成するよう指導した。今後、同様にしてC/P自ら事例集を改訂していくようコメントした。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>• C/Pは結果を報告書として記録するといったことに不慣れであるため、OJTを通じて記録を残すことを指導した。実際の審査・検査では記録を共有し、以降に、情報を活かせる仕組みをC/Pに定着させることが大切である旨を、専門家はC/Pに指導した。</li> <li>• NN1水力発電所のスタッフはLEPTSをよく理解していたが、Naxaython変電所では検査OJTを通じて変電所スタッフにLEPTSを伝達することもあった。</li> </ul>

## 現場検査記録

プロジェクト:	Nam Nhone 小水力発電所
区分:	完成検査
日付:	2011年9月24日～27日
参加者:	
DOE:	Dr. Phoukhong (水力土木)、Mr. Veingsay (水力電気および変電)、Ms. Santisouk (送電)
JICA:	ラオス事務所 議尾次長
専門家:	川上副総括 (水力土木)
活動内容:	<ul style="list-style-type: none"> <li>Bokeo県において建設中であったNam Nhone小水力発電所 (3 MW) について、DOEがBokeo PDEMに対して行う完成検査支援への指導・立会を行った。</li> <li>当時の電力法では、5 MW以下の水力発電所については県エネルギー局 (PDEM) が権限を有しているため、DOEはPDEMが行う完成検査への技術支援を行うという立場で参加した。</li> <li>検査終了後、参加者 (DOE、PDEM、EDLおよび事業者) はMMに署名し、事業者が保安規程 (Safety rule) および電気事業免許取得願を提出後に、県知事が合格証を出すことになった。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>本プロジェクトの事業者は、銀行からのローンを付けることなく事業を進めることができたが、(お金も技術も無い) 地方政府とのCAでは貸付を受けることができないため、中央政府による何らかの承認行為が必要である。</li> <li>C/PやPDEMには言葉 (英語) の壁があるため、M/Mの作成や議事進行の内容理解が困難である場面が見られた。大規模IPPにおいても、事業者が外国人であるため同時通訳やMMの言語 (英語、ラオ語等) の取り決めが必要である。</li> </ul>

## 現場検査記録

プロジェクト:	Nam Theun 2 水力発電所
区分:	事故調査 (地滑り)
日付:	2011年11月7日～9日
参加者:	
DOE:	Mr. Houmphanh (副部長)、Ms. Santisouk (送電)、Dr. Xayphone (送電)
専門家:	木下専門家 (水力電気)、織田専門家 (水土木補助)
活動内容:	<ul style="list-style-type: none"> <li>• 7月下旬から8月上旬にかけての多雨および洪水の影響でNam Theun 2送電設備の周辺で地滑りが生じ、支持物および基礎が一部損壊に至った。</li> <li>• DOEはDEPD経由でNam Theun 2電力会社 (NTPC) より情報を入手したため、NTPCに出向き、事象および今後の方針の説明を受けるとともに、地滑り箇所の現場視察を行った。</li> <li>• 建て替える新鉄塔の設計基準および事故報告を提出するように、DOEからNTPCへ依頼を行った。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>• LEPTSには事故が発生した場合、報告をする旨の記載があるものの、NTPCはDOEへフォーマットに沿った速報や詳報を提出していなかった。</li> <li>• Nam Theun 2水力発電所のCAにLEPTSの記載がないため、現場に行く前は、C/PはNTPCにLEPTSを遵守するよう強くは言えない、という誤った認識を持っていた。専門家はC/Pに、LEPTSがCAに記載されていなくとも、LEPTS等関係法令は遵守しなければならない旨を指導した。</li> </ul>

## 現場検査記録

プロジェクト:	Nam Ngum 5 水力発電所
区分:	湛水前検査
日付:	2012年2月6日～9日
参加者:	
DOE:	DOE: Mr. Houmphanh (副部長)、Ms. Santisouk (送電)、 Dr. Phoukhong (水力土木)、Mr. Lair (水力土木および配電)
DEB:	Ms. Suksamon Keophosay
専門家:	丸岡専門家 (送電)、藤原専門家 (送電)
活動内容:	<ul style="list-style-type: none"> <li>• Nam Ngum 5水力発電所 (事業者=Sinohydro社、ダム高=100.5m、発電容量=計120 MW、送電線距離=約0.9 km) において、湛水開始が予定されており、その前に土木設備の審査・検査を行う必要があった。今回現地で、DOEが行う土木及び送電設備に係る審査・検査への指導・立会を行った。</li> <li>• DOEは主任技術者届、建設の事前届、その他添付資料の提出を事業者に求め、その提出書類について審査を行った。その結果、土木工事の施工方法や洪水対策の詳細説明を事業者に求め、申請書及び審査に必要な書類の再提出を指示し、検査依頼書の提出等今後の必要手続きについて事業者の説明を行った。</li> <li>• 現場検査においては、DOE検査員が送電線地上高のLEPTS違反解消や品質確保の徹底を事業者に指導し、運開前に再度検査を行うことを事業者の説明した。</li> <li>• 検査終了後参加者 (DOE、DEBおよび事業者) はM/Mに署名し、DOEは一通りの審査・検査を実施できた。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>• 審査・検査に合格しないとCertificateを発行できないことを明言し、これは事業者に対して牽制することにもなっていたことから、DOEは規制組織としての機能を果たした。</li> <li>• 審査・検査についても、不足書類の提出・不具合事象の解消を的確に指摘していた。また、次回検査までに確実に指摘事項に対応することを事業者に要求するなど、フォローを行っていた。</li> <li>• 審査・検査書類の事前提出を要求したものの、提出されなかったことから、検査・審査のタイミングだけでなく、継続的に事業者に対して牽制をかけるような方策も必要である。</li> <li>• 会議をスムーズに進めるために、限られた時間中でM/Mを作成する必要があった。専門家は、C/Pの技術向上を図るため、M/M作成時のノウハウを引き続き指導していった。</li> </ul>

## 現場検査記録

プロジェクト:	道路拡張に伴う配電設備移設 (Vientiane Capital)
区分:	OJT
日付:	2012年2月28日
参加者:	
DOE:	Mr. Thammanoune (配電)、Mr. Phouxay (配電)、Mr. Lair (水力土木および配電)
専門家:	式町専門家 (配電)、和田専門家 (配電)
活動内容:	<ul style="list-style-type: none"> <li>• C/Pは、道路拡張による配電設備移設現場において、経験の浅いC/Pの審査検査能力を高めると同時に、ベテランC/Pの指導力を高めるため、審査検査のOJTを行った。</li> <li>• 現場で指摘したポイントを共有するために、EDLスタッフもC/Pに同行した。</li> <li>• OJT終了後、C/Pは専門家とともに事後確認会議を開催し、現場で指摘・議論したポイントを共有した。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>• C/Pは、住居設備間の低圧線離隔不足、B種接地を行っていない変圧器、張力不足の控線等、LEPTSに適合していない設備を指摘した。</li> <li>• ベテランC/Pは、現場でチェックしたポイントを経験の浅いC/Pに共有することにより、リーダーシップを発揮した。</li> <li>• 事後確認会議では、経験の浅いC/Pが積極的に意見を出していた。専門家は、C/Pは検査ポイントをある程度のレベルまで理解していることを確認した。</li> </ul>

## 現場検査記録

プロジェクト:	Thanaleng 変電所
区分:	OJT
日付:	2012年2月29日
参加者:	
DOE:	Mr. Phouxay (配電)、Mr. Va (水力電気および変電)、Mr. Lair (水土木および配電)
専門家:	式町専門家 (配電)、和田専門家 (配電)、木下専門家 (水力電気)、高橋専門家 (変電)
活動内容:	<ul style="list-style-type: none"> <li>• 専門家はC/Pと共に、Thanaleng 115 kV変電所において、竣工検査のOJTを実施した。</li> <li>• 水力電気および変電のC/Pに対し、手引書および事例集を用いて、チェックポイントの説明及び技術基準との適合良否判定について重点的に説明し、良い事例・悪い事例を確認しながら理解を深めた。</li> <li>• 検査結果についてC/Pと事後確認会議を行い、今回得られた知見を基に事例集の更新を行った。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>• OJTを重ねるごとに若手C/Pの検査能力が向上していると感じた。引き続きOJTを実施し、実検査に向けて能力向上を図る重要性を感じた。</li> <li>• 試験記録審査についてもOJTを実施したかったが、現地には試験記録が保管されていなかった。</li> </ul>



## 現場検査記録

プロジェクト:	Hongsa Lignite 火力発電所
区分:	岩盤検査
日付:	2012年5月23日～26日
参加者:	
DEM:	Dr. Phoukhong (水土木)、Mr. Phouxay (送電および配電)、Mr. Va (水力電気および変電)
専門家:	織田専門家 (水土木補助)
活動内容:	<ul style="list-style-type: none"> <li>• Hongsa石炭火力発電所(Xayabouri県、事業者：Hongsa Power Company(HPC)、出力：1,878MW)において、冷却水取水用のダム (Nam Luokダム：ダム高53.4m、Nam Kenダム：ダム高62.5m) の岩盤検査を行った。</li> <li>• DEMはHPCに、検査前に提出されているべきForm4 (ダムの岩盤検査申請書類) を、速やかに提出するように要求した。</li> <li>• ダムサイトでグラウチング工事のOJTを実施した。C/Pは、ロックハンマーを用いて岩盤状況を確認した。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>• DEMが自ら事前に議事録 (案) を準備したため、議事録の内容について、HPCとのディスカッションをスムーズに進めることができた。</li> <li>• 事業者に現場検査前に書類を提出させる重要性を、専門家はC/Pに指導した。</li> </ul>

## 現場検査記録

プロジェクト:	Nam Mang 3 水力発電所 (既設)
区分:	OJT
日付:	2012年5月31日
参加者:	
DEM:	Mr. Phouxay (送電)、Mr. Va (水力電気および変電)、Mr. Lair (水土木)
専門家:	高橋専門家 (変電)、西尾専門家 (水力電気)、藤原専門家 (送電)
活動内容:	<ul style="list-style-type: none"> <li>• C/Pの検査能力向上を主目的として、Nam Mang 3 水力発電所 (事業者=CWE社 (China International Water and Electric、EDL)、有効落差=543m、発電容量=計40 MW、変圧器容量=計44MVA、送電線距離=約35 km) において、手引書を活用した検査OJTを実施した。</li> <li>• 検査後に会議を行い、OJTで得られたデータを元に、必要に応じて事例集を改訂するようC/Pに指導した。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>• 事後確認会議において、C/Pは自ら本OJTの結果説明を行い、また不明な点は専門家に聞くなどして、設備や検査に対する理解を深めることができたことから、本OJTでの目的は達成されたといえる。</li> <li>• 実際の検査では、不具合箇所を現場で指摘する必要性もあることから、現場での確に指摘できるよう見るべきポイントや、必要に応じて、図面や測定結果、施工方法など確認すべきポイントについて技術移転を実施していく必要がある。</li> <li>• 将来的にはC/Pが若手に指導していく必要があるため、本OJTで得られた知見について、C/P同士で説明し合う場を設けた。検査OJTおよび事前・事後会議の場を用いて積極性の醸成を図り、検査において若手に指導できるよう、専門家はC/Pに技術移転を図った。</li> <li>• 本OJTで得られた実設備とそれぞれの役割に係る知見を活かして、書類審査能力向上を図った。</li> </ul>

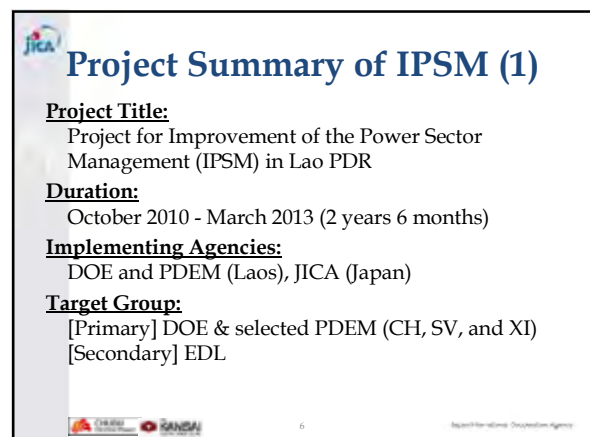
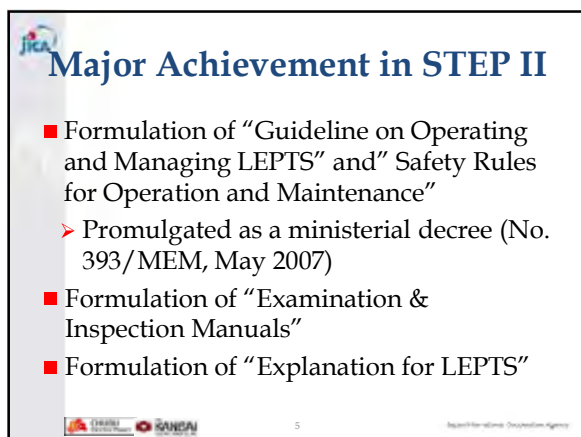
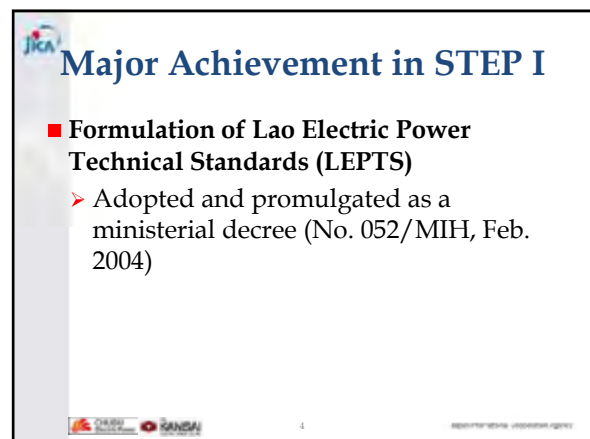
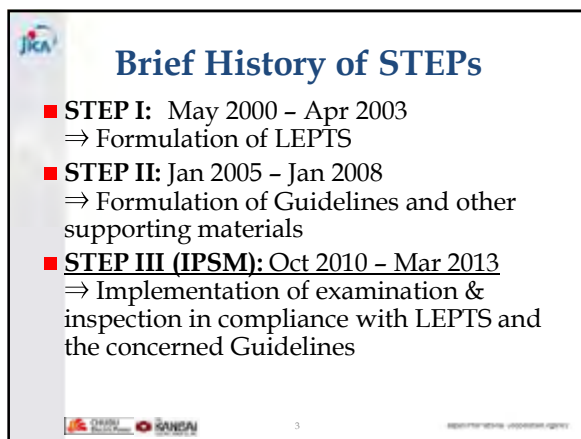
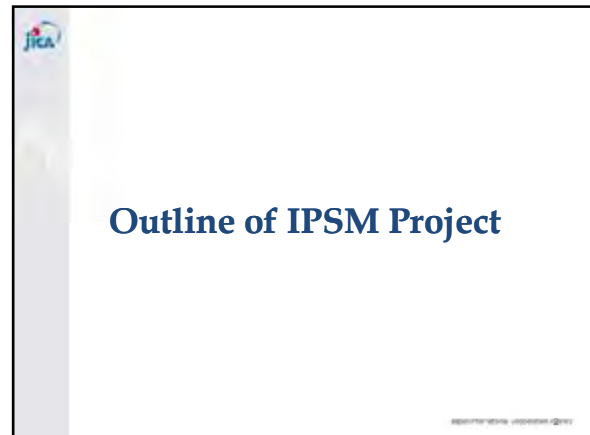
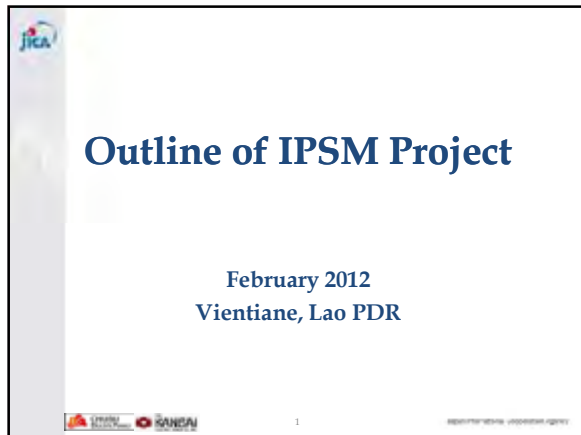
## 現場検査記録

プロジェクト:	Nam Ngum 5 水力発電所
区分:	湛水前再検査
日付:	2012年6月4～6日
参加者:	
DEM:	Dr. Phoukhong (水土木)、Mr. Veingsay (水力電気および変電)、Mr. Minist (送電および配電)、Mr. Lair (水土木)
専門家:	織田専門家 (水土木補助)、西尾専門家 (水力電気)
活動内容:	<ul style="list-style-type: none"> <li>• Nam Ngum5水力発電所において、2012年2月に行われた湛水前検査時には、ダム計測設備、洪水吐ゲート等が未設置であり、6月までに設置することになっていた。その対応状況確認および、発電所および変電設備の現場進捗確認を目的として、サイトへ専門家が同行した。</li> <li>• プーコン氏は前回の議事録をSino社のメンバーに見せ、前回指摘事項を1つ1つ相手側に進捗を確認する等、毅然とした態度は、検査官としてふさわしい姿であった。</li> <li>• 洪水吐ゲートにおいては工事の進捗が遅れており、進捗を確認するに留まった。</li> <li>• ダム計測設備においては、変形を監視するためのベンチマークおよび反射プリズムは確認できたものの、プラムラインは未設置、漏水計測設備も確認できなかった。Sino社は湛水開始後の変形を記録しているとは言っていたものの、記録は見当たらなかったため、プーコン氏が先方にデータの提出を要求した。</li> <li>• 発電所、変電所およびダムサイトにおいて、OJTを実施した。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>• 2月上旬の検査時の指摘事項を踏まえ、Sino社は2月下旬に、Form1 (主任技術者届 (BD時、建設時および運開後の3部))、Form2 (送電、BD時)、Form5 (湛水前検査) およびForm6 (操作規程) を提出しており、2月時点でのDEMの役割が、十分果たせていると考えられる。</li> <li>• 全ての検査に合格しないと、Certificateは発行しないと繰り返し相手側に言う等、DEMの規制機能は果たせていると考えられる。</li> <li>• 工事の遅れにより、現場で確認できない項目があった。C/Pは現場に来る前に、より事業者と連絡を取り、工事の進捗状況を確認する必要がある。</li> <li>• C/Pが現場確認の行程を決定するという姿が見られた。(以前は、相手側の言われるままの現場確認行程であった。)</li> </ul>

## 現場検査記録

プロジェクト:	Vientiane 県配電設備 (2)
区分:	OJT
日付:	2012年7月2、3日
参加者:	
DEM:	Mr. Thammanoune (配電)、Mr. Oudomsine (配電)、Mr. Sengpheth (配電)
専門家:	式町専門家 (配電)、小野澤専門家 (研修強化)
活動内容:	<ul style="list-style-type: none"> <li>• PDEMおよび新規配属C/PのLEPTS審査・検査能力向上およびベテランC/Pの指導能力強化を主目的として、専門家も同行し、Vientiane Provinceにおいてチェックリストを活用した審査OJTを、過去のB/D書類を用いて実施するとともに、Vang Viengにおいてチェックリストを活用した配電設備の検査OJTを実施した。</li> <li>• 審査・検査OJTを実施後にPDEM、Provincial EDLを含めた全体会議を開催し、現地設備の不適合箇所について共有化を図るとともに、PDEM、Provincial EDLとチェックリストの実習結果等の意見交換を実施した。</li> </ul>
所見:	<ul style="list-style-type: none"> <li>• 今回ベテランC/P 1名と新規配属のC/P 2名が参加したが、ベテランC/Pは習熟度が高く、PDEMへの指導内容も前回から格段に向上した。一方、新規配属のC/P 2名はまだLEPTS内容を理解していない部分が多く、習得のための教育が必要であり、PDEMへ指導できるレベルに到達するには長期的な教育・指導が必要であった。専門家は、OJT後に新規配属のC/Pに基礎的な技術を指導した。また、新規配属の2名は、英語がほとんど理解できず、指導の障壁となっていた。</li> <li>• PDEMはLEPTS審査・検査能力習得への高い意欲を示したが、まだまだ低い技術レベルにあり、専門家は、C/Pに進捗をフォローするために、引き続きセミナーを開催するようお願いした。</li> <li>• 設計審査において提出書類に不備があり、PDEMが追加提出や修正を要請した場合でも、コントラクターに十分な能力がない可能性があることが判明した。コントラクターに研修を行う必要性について、C/PはPDEMへ説明した。PDEMはそのような研修の重要性だけでなく、自らコントラクターに指導するためにLEPTSを学ぶ必要性を認識した。</li> </ul>

### (3) DEB および DEPP との協議資料



**Project Summary of IPSM (2)**

**Overall Goal:**  
The number of electric power facilities that suit LEPTS increases and the electric power is stably supplied

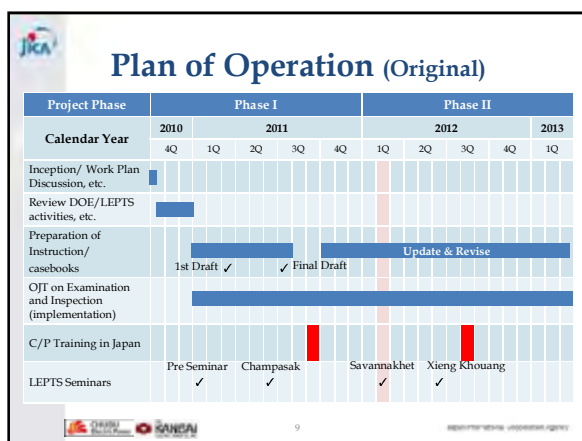
**Project Purpose:**  
Regulatory function in the power sector is strengthened

**Project Summary of IPSM (3)**

**Output 1:**  
DOE's examination and inspection capabilities are enhanced.

**Output 2:**  
The capacity of DOE for supervising PDEM is enhanced.

**Output 3:**  
Understanding on LEPTS in target provinces is improved.



**Project Team (DOE→DER)**

	NAME	TITLE
1	Mr. Viraphonh VIRAVONG	Project Director, Vice Minister of MEM
2	Mr. Bouathep MALAYKHAM	Director of EPMD
3	Mr. Houmphanh VONGPHACHAN	IPSM Managing Director, DD of EPMD
4	Mr. Veingsay CHANTHA	Substations, Hydropower Electrical Engineering, (Civil Engineering)
5	Mr. Thammanoune NAKHAVITH	Distribution Lines, Private Company
6	Ms. Santisouk PHIMPACHANH	Ministerial Ordinance, Transmission Lines
7	Dr. Xayphone BOUNSOU	Ministerial Ordinance, Transmission Lines, Nuclear Power, (Civil Engineering)
8	Dr. Phoukhong SENGVILAY	Civil Engineering
9	Mr. Phouxay VIENGVIXAY	Distribution Lines, Private Company
10	Mr. Va YATHOTU	Hydropower Electrical Engineering
11	Mr. Lair PHIMPHISAME	Distribution Lines, Civil Engineering

**Project Team (JICA Experts)**

	NAME	COMPANY	TITLE
1	Mr. Hirokazu NAKANISHI	Chubu	Chief Advisor/ Hydropower Civil Engineering 1
2	Mr. Yasuhiro KAWAKAMI	Chubu	Deputy Chief Advisor/ Hydropower Civil Engineering2/ Institutional and Organizational Issues
3	Mr. Hirofumi FUJITA	Kansai	
4	Mr. Hirokazu KINOSHITA	Kansai	Hydropower Electrical Engineering
5	Mr. Akira NISHIO	Kansai	
6	Dr. Koji SHIKIMACHI	Chubu	Distribution Lines 1
7	Mr. Hideki WADA	Chubu	Distribution Lines 2
8	Mr. Yoshio MARUOKA	Kansai	Transmission Lines
9	Mr. Hiroaki FUJIWARA	Kansai	
10	Mr. Kenta TAKAHASHI	Kansai	Substations
11	Mr. Masato ONOZAWA	Chubu (Pionnier Research)	Development of Training
12	Mr. Koji ODA	Chubu	Coordinator/ Assistant Hydropower Civil Engineering

**Progress of the Project**



## Major Achievement in Phase I

- Instructions and casebook for inspection prepared.
- Actual site inspections conducted.
- The first seminar for PDEM organized in Champasak province.
- Counterpart training in Japan organized with six participants (4 from DOE and 2 from PDEM).



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International Cooperation Agency



## Intensive activities in Phase II



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International Cooperation Agency



## Intensive activities in the phase II

1. Focus on examination and inspection for IPP Projects
2. Reconfirm the relationship among DOE, EDL and GOL (MEM)
3. Strengthen the regulatory capabilities of DOE and PDEM
4. Formulation of long-term (10 years) guidance for electric power regulation.



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## 1. Focus on examination and inspection for IPP Projects

- Support the revision of LEPTS and the relevant guidelines according to the organizational and administrative changes
- Clarification of the procedures for IPP development (PDA, CA)
- Practical instructions for examination



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## 2. Reconfirm the relationship among DOE, EDL and GOL (MEM)

- Technical discussion to conform LEPTS articles and EDL regulations with EDL technical dept. and training center
- Review the existing records of internal examination and inspection conducted by EDL



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## 3. Strengthen the regulatory capabilities of DOE and PDEM


- LEPTS understanding seminars
  - ✓ February 21-23, 2012 in Savannakhet (⇒ suspended)
  - ✓ June 19-21, 2012 in Xieng Khouang
- More technical instructions to be applied for examination
- Preparation of practical instructions written in Lao language



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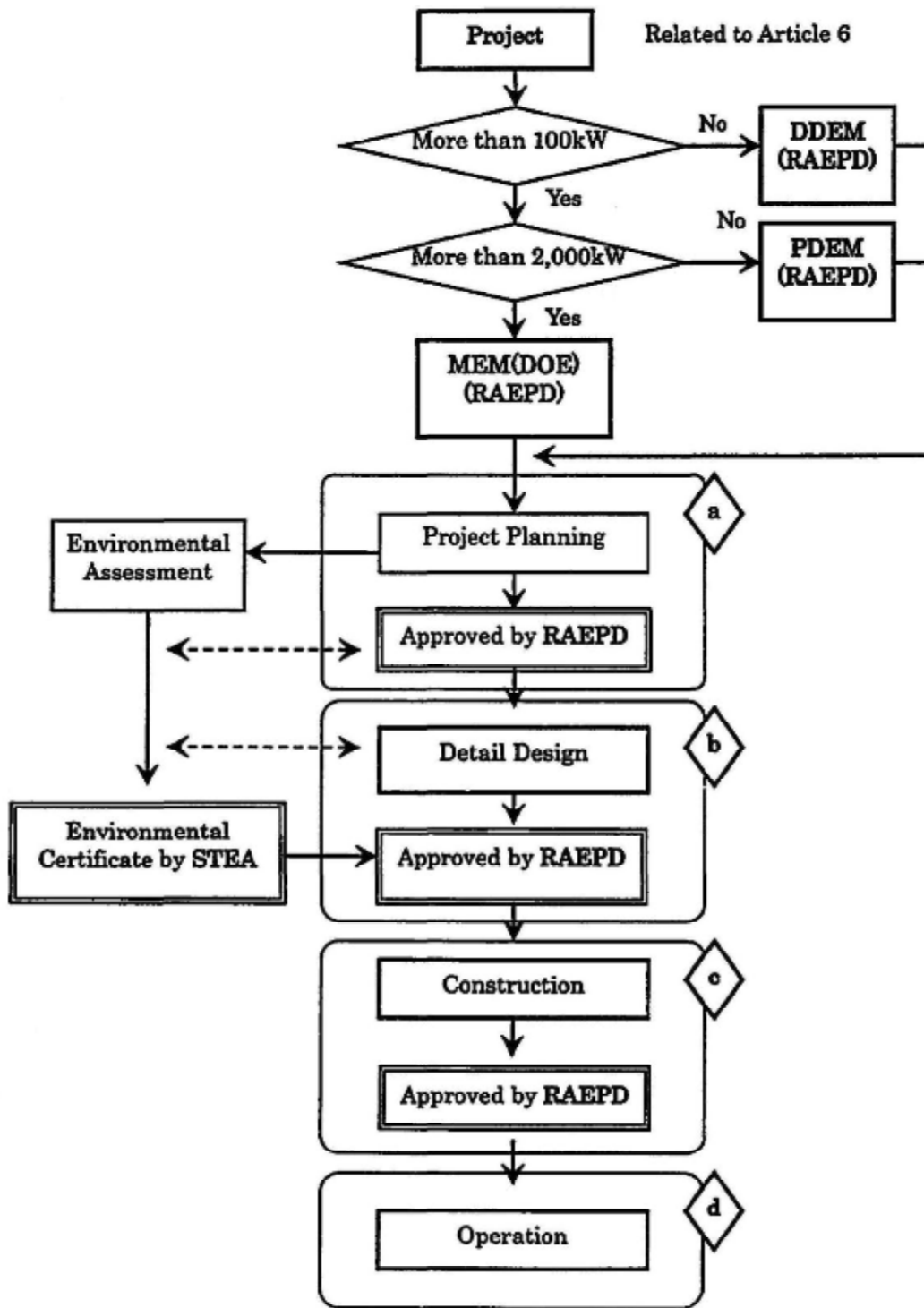


 **4. Formulation of long-term guidance for electric power regulation.**

- Analyses on current regulatory situation (institutional structure, IPP projects, neighboring countries etc.)
- Establishment of regulatory stages (quality and quantity of regulation)
- Stage-wise dissemination plan of LEPTS for DOE, PDEM and EDL



*Thank you for your attention!*



(source) Guideline on Operating and Managing Lao Electric Power Technical Standards

**Figure: Procedure of Electric Power Development**

**Table: Draft job demarcation among departments**

No.	Responsibilities of RAEPD	DEPP	DER	DEB
i)	Reviews and comments project description	—	—	—
ii)	Reviews and approves the scope of works for pre-feasibility study and/or feasibility study	—	—	—
iii)	Reviews and approves field investigation plans for prefeasibility study and/or feasibility study	—	—	—
iv)	Examines and approves pre-feasibility study	✓✓	✓	✓✗
v)	Examines and approves feasibility study	✓✓	✓	✓✗
vi)	is notified of chief engineers and registers them	—	✓✓	—
vii)	Reviews and approves field investigation plans for detail design	✓	✓✓	✓✗
viii)	Examines and approves design criteria and detail design	✓	✓✓	✓✗
ix)	Examines and approves modification of detail design	✓	✓✓	✓✗
x)	Inspects dam foundation	—	✓✓	—
xi)	Inspects prior to first impounding	—	✓✓	—
xii)	Examines and inspects power facilities before commencement of operation	—	✓✓	—
xiii)	is notified of flood management rule	✓✓	✓	✓=
xiv)	is notified of safety rules	—	✓✓	—
xv)	orders remedy to the Owner for conformance to LEPTS	—	✓✓	—

(legend)

✓✓: Responsible department

✓: Concerned department

#### (4) プロジェクト一覧

## 1. Power Projects in Lao PDR - Under Construction

No	Name of Project	Location Province	Installed Capacity (MW)	STATUS		Investors (Sponsors)	Planned Market	Remarks
				Progress of MOU/PDA/CA	Commercial Operation			
1	Hongsia Lignite (IPP)	Xayaboury	1,878	PDA (HOA) Signed 18/12/2006 and period 18 months, renewal 19/12/08 to 20/6/09 Tariff MOU 13/5/09 (PDA signed with Thai-Lao Lignite of Thailand on 22 July 1994 was procedurally terminated in October 2006)	2015	<ul style="list-style-type: none"> <li>LHSE 20%</li> <li>Ratchaburi 40%</li> <li>BANPU 40%</li> </ul>	Laos/Thailand	Progress Construction 9.1%
2	Nam Long	Luangnamtha	5	CA Signed 21/3/2011	2013	Luangpaseuth Construction Co., Ltd	Laos	CA completed
3	Nam Ngum 5 Hydropower (IPP)	Luangprabang /	120	CA Signed 10/4/2007	2012	<ul style="list-style-type: none"> <li>EDL 15%</li> <li>Sinohydro (China) 85%</li> </ul>	Laos	Progress Construction 80.6%
4	Nam Ngiep 2	Xiengkhouang	180	PDA Signed 25.8.2010 and period 18 month	2015	CWE (China)		Under Construction
5	Nam Sim (IPP)	Houaphan	8	PDA Signed 2/10/2007	2015	<ul style="list-style-type: none"> <li>ECI (Laos) 25%</li> <li>Energy Development AS (Norway)</li> </ul>	Laos	CA completed
6	Tad Salen Hydropower (IPP)	Savannakhet	3.2	<ul style="list-style-type: none"> <li>PDA not required</li> <li>CA Signed 03/02/2009</li> </ul>	TBD	SIC Manufacturer (Thailand) 100%	Laos	Progress Construction 40%
7	Theun-Hinboun Hydropower Expansion (IPP)	Bolikhamxay	220+60	<ul style="list-style-type: none"> <li>CA Amended 27/8/2008</li> </ul>	2012	<ul style="list-style-type: none"> <li>EDL 60%</li> <li>Nordic Group (Norway) 20%</li> <li>MDX (Thailand) 20%</li> </ul>	Laos/Thailand	Progress Construction 96%
8	Xekaman 3 Hydropower (IPP)	Sekong	250	<ul style="list-style-type: none"> <li>PDA not required</li> <li>CA Signed 4/01/2006</li> </ul>	2010	<ul style="list-style-type: none"> <li>EDL 15%</li> <li>VLP (Vietnam) 85%</li> </ul>	Laos/Vietnam	Progress Construction 96.18%
9	Xekaman 1 Hydropower (IPP)	Attapeu	322	CA Signed 10/2/2011	2013	<ul style="list-style-type: none"> <li>GOL 15 - 30%</li> <li>VLP (Vietnam) 70-85%</li> </ul>	Vietnam/Laos	Progress Construction 11.6%
10	Xayabouri (Mekong) (IPP)	Xayaboury/ Luangprabang	1,285	CA Signed 29/10/2010	2019	<ul style="list-style-type: none"> <li>GOL 20%</li> <li>Ch. Kanchang &amp; PT 80%</li> </ul>	Laos/Thailand	Pre-Construction

4,331

## 2. Power Projects in Lao PDR - Planning Stage (PDA Stage)

No	Name of Project	Location Province	Installed Capacity (MW)	STATUS		Investors (Sponsors)	Planned Market	Remarks
				Progress of MOU/PDA/CA	Commercial Operation Date			
1	Don Sahong (Mekong)	Champasak	240	PDA Signed 13/02/2008	2017	<ul style="list-style-type: none"> <li>GOL 20%</li> <li>Mega First (Malaysia) 80%</li> </ul>	Laos/Thailand	PDA Completed
2	Nam Beng	Oudomxay	34	PDA Signed 10/3/2010	2015	China National Electrical Equipment Corp.	Laos	PDA Completed
3	Nam Kong 1 (IPP)	Attapeu	150	PDA Signed 23/06/2008	2017	<ul style="list-style-type: none"> <li>Region Oil (Russia) 80%</li> <li>LHSE 20%</li> </ul>	Thailand	CA/PPA Negotiation
4	Nam Lik 1 (IPP)	Vientiane	60	PDA Signed 08/4/2008	2014	<ul style="list-style-type: none"> <li>GOL 20%</li> <li>Hydro Engineering Co. (Thailand) 80%</li> </ul>	Laos	CA/PPA Negotiation
5	Nam Mang 1 (IPP)	Bolikhamxay	57	PDA Signed 20/5/2010	2015	Far-East Industrial Co., Ltd	Laos	CA/PPA Negotiation
6	Nam Mo (IPP)	Xiengkhouang	120	PDA Signed 30/03/2008	2015	<ul style="list-style-type: none"> <li>HN.CIT 65%</li> <li>Viet-Lao Economical Cooperative General Co. (VLECG) 35%</li> </ul>	Vietnam	CA/PPA Negotiation
7	Nam Ngiep 1 Hydropower (IPP)	Bolikhamxay	262.9	PDA Signed 27/4/2006 and period 18 months, renewal 27/5/08 to 26/2/09	2018	<ul style="list-style-type: none"> <li>LHSE 25%</li> <li>Kansai Electric &amp; Nippon Koei (Japan) 45%</li> <li>EGAT Inter 30%</li> </ul>	Laos/Thailand	CA Negotiation
8	Nam Ngum 3 Hydropower (IPP)	Vientiane and Xieng Khouang	460	PDA Signed 15/11/97	2017	<ul style="list-style-type: none"> <li>LHSE (Laos) 23%</li> <li>Marubeni (Japan) 25%</li> <li>Ratchaburi (Thailand) 25%</li> <li>GMS (Thailand) 27%</li> </ul>	Thailand	CA/PPA Negotiation
9	Nam Ou 1-7 (Cascade)	Phongsaly/ Luangprabang	1,156	PDA Signed 15/10/2007	2013-2016	<ul style="list-style-type: none"> <li>GOL 10 - 25%</li> <li>Sinohydro (China) 90% - 75%</li> </ul>	Thailand or China and Laos	CA Negotiation
10	Nam Phak	Champasak	45	PDA Signed 06/11/2009	2015	<ul style="list-style-type: none"> <li>EDL 20%</li> <li>Kobe Green Power Co., Ltd (Japan) 80%</li> </ul>	Laos	PDA Completed
11	Nam Pha	Luangnamtha / Bokeo	130	PDA Signed 20/8/2010 and period 18 months	2016	AP Bizlink Group (Malaysia)	Laos	PDA Completed
12	Nam Sane 3 (IPP)	Xiengkhouang	65	PDA Signed 19/06/2008	2016	<ul style="list-style-type: none"> <li>GOL 25%</li> <li>Rohas Euco Industries Berhad (Malaysia) 75%</li> </ul>	Laos	PDA Completed
13	Nam Seuang 1	Luangprabang	63	PDA Signed 11/8/2010 and period 18 month	2017	Bru Thai International	Laos/Thailand	PDA Completed
14	Nam Seuang 2	Luangprabang	141	PDA Signed 11/8/2010 and period 18 month	2017	Bru Thai International	Laos/Thailand	PDA Completed

15 Nam Tha 1	Bokeo/ Luangnamtha	168 PDA Signed 16/6/2010	2015	<ul style="list-style-type: none"> <li>•Gol 25%</li> <li>•China Souther Grid 75%</li> </ul>	Laos/Thailand	CA/PPA Negotiation
16 Nam Theun 1 Hydropower (IPP)	Bolikhamxay	523 •CA/PPA under negotiation (tariff concluded)	2018	<ul style="list-style-type: none"> <li>•LHSE 20%</li> <li>•Gamuda (Malaysia) 40%</li> <li>•EGCO (Thailand) 40%</li> </ul>	Laos/Thailand	PDA Completed
17 Pakbeng (Mekong)	Oudomxay/ Xayaboury	855 PDA Signed 27/12/2010 and period 18 month	2018	<ul style="list-style-type: none"> <li>•GOL 19%</li> <li>•Datang Ove seas Investment Co.,Ltd 81%</li> </ul>		PDA Completed
18 Phou Ngoy (Mekong)	Champasak	651 PDA Signed 7/12/2010 and period 18 months	2018	Charoen Energy and Water Asia Co.,Ltd	Thailand/Laos	PDA Completed
19 Sanakham (Mekong)	Xayaboury/ Vientiane	660 PDA Signed 27/12/2010 and period 18 month	2018	<ul style="list-style-type: none"> <li>•GOL 19%</li> <li>•Datang Ove seas Investment Co.,Ltd 81%</li> </ul>		PDA Completed
20 Se Kong 4 Hydropower (IPP)	Sekong	300 PDA signed 23/6/2008	2017	<ul style="list-style-type: none"> <li>•LHSE 20%</li> <li>•Region Oil (Russia) 80%</li> </ul>	Thailand	CA/PPA Negotiation
21 Se Kong 5 Hydropower (IPP)	Sekong	330 PDA signed 19/6/2009	2016	Region Oil (Russia) Strategic partners to be invited	Thailand /Laos	CA/PPA Negotiation
22 Xenamnoy 1	Champasak/ Attapeu	148 PDA Signed 25/01/2010	2013 - 2014	<ul style="list-style-type: none"> <li>•GOL 10%</li> <li>•Phongxubthavy Road and Bridge Construction Co., Ltd 90%</li> </ul>		CA/PPA Negotiation
23 Xepian-Xenamnoy (IPP), Attapeu and Champasak	Attapeu and Champasak	390 PDA Signed 14/11/2008 and period 18 months	2016	<ul style="list-style-type: none"> <li>•LHSE 24%</li> <li>•SK Engineering &amp; Construction (Korea) 26%</li> <li>•Korea Western Power Co., Ltd 25%</li> <li>•Ratchaburi Electric Generating</li> </ul>	Thailand/Laos	CA Negotiation
24 Xe Katam (IPP)	Champasak	61 PDA Signed 20/12/2007 and period 18 months	2016	<ul style="list-style-type: none"> <li>•GOL 25%</li> <li>•Kansai (Japan) 55%</li> <li>•Thai investor 20%</li> </ul>	Laos	PDA/PPA Completed
25 Nam Kong 2	Attapeu	66 PDA Signed 16/3/2011 and period 18 months	2017	Hong Anh Gai Lai Mineral Joint Stock Company		
26 Nam Phai	Vientiane	60 PDA Signed 20.12.2011		Norinco International Cooperation (China)		

## (5) LEPTS 理解促進セミナー



a) プレセミナー(Vientiane )

**Agenda for the Pre-seminar  
on  
The Technical Cooperation for Improvement of Power Sector  
Management (IPSM)  
08:30-16:00, February 25, 2011  
International Cooperation and Training Center ICTC, at Km 5**

- 8:30- Registration
- 9:00- Opening Remarks
- Mr. Hatsady SYSOULATH, Deputy Director General of Department of Electricity, Ministry of Energy and Mines
  - Mr. Yoshiharu YONEYAMA, Senior Representative of JICA Laos Office
- (Group Photo Session)
- 9:20- Presentation by Japanese Experts
- 9:50- Presentation by DOE
- 10:20- Coffee Break
- 10:40- Presentation by EDL
- 11:10- Presentation by PDEM  
(Xieng khouang, Savannakhet, Champasak)
- 11:40- Questions and Answers
- 12:00- Lunch
- 13:00- Group Discussion
- A group: Xieng khouang PEEM
  - B group: Savannakhet PDEM
  - C group: Champasak PDEM
- 15:00- Coffee Break
- 15:10- Whole Discussion
- 15:50- Closing Remarks
- Mr. Hatsady SYSOULATH, Deputy Director General of Department of Electricity, Ministry of Energy and Mines

b) 第1回セミナー (Champasak)

## Program for the Seminar on **Promotion of Lao Electric Power Technical Standards for**

"The Technical Cooperation for Improvement of Power Sector Management (IPSM)"

6 to 9 June 2011

for

Champasak Provincial Department of Energy and Mines (PDEM)

### 1. Goals of the Seminar

- To promote understanding of the LEPTS background, objectives and procedures in Provinces (PDEMs).
- To enhance the inspection skills mainly in the field of small hydropower and distribution in Provinces (PDEMs).

### 2. Objective of the Seminar

After the successful completion of the seminar, participants will be able to carry out inspection and examination of electric power facilities based on LEPTS.

### 3. Participants

<u>Organization</u>	<u>No. of Participants</u>	<u>Organization</u>	<u>No. of Participants</u>
DOE	8	PDEM	8
JICA Laos Office	2	EDL	13
(8 & 9 June: Mr. Matsuzaki and Mr. Kayasith)		ECI	1
JICA Experts	4		
(Mr. Kawakami, Mr. Fujita, Mr. Fukunaga Mr. Maruoka,)			

### 4. Venue and Agenda of the Seminar

Venue: Champasak Palace Hotel, Pakse

Road No.13 Ban Prabath P.O.Box 718, Pakse LAO PDR, Laos

TEL: +856-31-212 263

FAX: +856-31-212 781

Agenda: (Attached)

## Agenda of the Seminar

Date & Time		Activities	Lecturer(s)	Remarks
<b>Day 1</b>	<b>June 6 (Mon)</b> 8:30 - 9:00	Registration		
	9:00 -	Opening Remarks - PDEM - JICA Team	Representatives from PDEM and Mr. Kawakami	
	9:10	Outline of LEPTS and procedures, and roles as regulator (Picture and coffee break)	Mr. Bouathep	Purpose of the seminar, procedures of LEPTS with the existing materials, etc.
	9:30 - 11:00	Lecture for hydropower civil engineering	Dr. Phoukhong (Mr. Kawakami)	Introduction of check list and case book. Topics on examination and inspection are highlighted.
	11:00 - 12:00	Lecture for hydropower facilities	Mr. Viengsay (Mr.Fujita)	
	Break (Lunch)			
	13:00 - 1500	Lecture for distribution lines  (Coffee break)	Mr. Thammanoune and Phouxay (Mr.Fukunaga)	
15:15 - 16:00	Lecture for transmission line	Ms. Santisouk (Mr. Maruoka)		
<b>Day 2</b>	<b>June 7 (Tue)</b> 8:00 – 17:00	Field OJT to Se Xet 1 &2 Hydro civil and electrical engineering (Existing and under construction sites)	Headed by Dr. Phoukhong and Mr. Viengsay	By 2 mini buses
<b>Day 3</b>	<b>June 8 (Wed)</b> 8:00 – 17:00	Field OJT Distribution lines	Headed by Mr. Mr. Thammnoune	By 5 4WD
<b>Day 4</b>	<b>June 9 (Thu)</b> 8:30-	Questionnaire (Questions collected and summarized)	ALL	Confirmation on procedures of examination using LEPTS, check list and case book.
	Tea/ coffee break as necessary			
	- 11:30	Answering the questions by participants (continued)	ALL	
	11:30-12:00	Evaluation of the Seminar	ALL	
	Break (Lunch)			
13:30- 15:00	Presenting Certificate & Closing Remarks - DOE - JICA Lao Office	Mr. Bouathep and Mr. Matsuzaki	Certificate of completion will be granted	

c) 第2回セミナー (Xieng Khouang)

## Program for the Seminar on **Promotion of management on Lao Electric Power Technical Standards for**

"The Technical Cooperation for Improvement of Power Sector Management (IPSM)"

21 to 26 October 2012

for

Xiengkhouang Provincial Department of Energy and Mines (PDEM)

### 1. Goals of the Seminar

- To promote understanding of the LEPTS background, objectives and procedures in Provinces (PDEMs).
- To enhance the inspection skills mainly in the field of small hydropower and distribution in Provinces (PDEMs).

### 2. Objective of the Seminar

After the successful completion of the seminar, participants will be able to carry out inspection and examination of electric power facilities based on LEPTS.

### 3. Participants

<u>Organization</u>	<u>No. of Participants</u>	<u>Organization</u>	<u>No. of Participants</u>
DEM	12	PDEM	13
JICA Laos Office	1	Provincial divisions	3+10
( Mr. Yuzurio (only from 24 to 25 OCT)		EDL Headquarters	4
JICA Experts	4	Provincial EDL	4
(Mr. Kawakami (only on 22 OCT), Mr. Onozawa, Mr. Kinoshita, Mr. Wada)		Provincial private co.	6

\* Participants of Provincial divisions and Provincial private co. attend only in the morning on 22 OCT.

### 4. Venue and Agenda of the Seminar

Venue: Conference Room at Golden Mountain Garden Group Hotel

Phonesavanxay village, Paek District, Xiengkhouang Province, LAO PDR

TEL & FAX: +856-61-213899

Agenda: (Attached)

## Agenda of the Seminar

	Date & Time	Activities	Lecturer(s)	Remarks
<b>Day 1</b>	<b>21 OCT (Sun)</b> 7:00 - 17:00	Transfer from Vientiane to Phonsavang	-	By two van and airplane
<b>Day 2</b>	<b>22 OCT (Mon)</b> 8:30 - 9:00	Registration	-	
	9:00 - 9:15 (15min)	Opening Remarks from DEM, PDEM, JICA Team	Representatives from DEM, PDEM and JICA Team	
	9:15-12:00 (2h30m)	Lecture on outline of <b>Electric Law, LEPTS</b> , procedures, and roles as regulator (including 15 min. coffee break)	Mr. Houmphanh	Purpose of the seminar, Electric Law and LEPTS 2 sets of LEPTS
	Group photo session / Lunch			
	13:30 - 14:00 (30min)	Presentation of <b>Action plan</b>	Mr. Khamkeuth	Based on the training in Japan
	14:00 - 16:00 (1h45m)	Lecture for <b>hydropower civil engineering</b> (including 15 min. coffee break)	Dr. Phoukhong	Introduction of check list and casebook. Topics on examination and inspection are highlighted.
	16:00-16:30 (30min)	Q&A session		
<b>Day 3</b>	<b>23 OCT (Tue)</b> 8:30 - 10:00 (1h30min)	Lecture for <b>hydropower electrical engineering</b> (including 15 min. coffee break)	Mr. Va	
	10:00 - 10:30 (30min)	Q&A session		
	10:45 - 11:45 (1h)	Lecture for <b>substation</b>	Mr. Houmphanh	
	11:45 - 12:00 (15m)	Q&A session		
	Lunch			
	13:00 - 14:30 (1h30min)	Lecture for <b>distribution lines</b> (including 15 min. coffee break)	Mr. Thammanoune	
	14:30 - 15:00 (30min)	Q&A session		
	15:15 - 16:15 (1h)	Lecture for <b>transmission lines</b>	Mr. Phouxay	
16:15 - 16:30 (15m)	Q&A session			
<b>Day 4</b>	<b>24 OCT (Wed)</b> 8:00 - 9:30	Transfer from Phonsavang to Namka	-	By two van and three mini van
	9:30 - 11:30 (2h)	Field OJT to the followings -Namka small hydropower dam/station	Dr. Phoukhong and Mr. Va	
	Transfer (1h) / Lunch			
	13:30 - 14:00 (30min)	-115 kV T/L in Lat houang	Mr. Phouxay	Check list and casebook will be used.
	14:15 - 15:15 (1h)	-22 kV D/L in Lat houang	Mr. Thammanoune	
	15:30 - 16:00 (30min)	-115/22 kV Phone thong S/S	Mr. Houmphanh	



	Date & Time	Activities	Lecturer(s)	Remarks
<b>Day 5</b>	<b>25 OCT (Thu)</b> 8:30 - 11:30	DEM will Answer the Questions of Day2-Day4	ALL	
	11:30-12:00	Questionnaire of the Seminar (Evaluation)	ALL	
	Lunch			
	13:30- 15:00	Presenting Certificate & Closing Remarks from DEM, JICA Team	Representatives from DEM and JICA Team	Certificate of completion will be granted to participants.
	15:00 - 17:00	Review and Evaluation of the Seminar	DEM and JICA Team	
	<b>26 OCT (Fri)</b> 7:00 - 17:00	Transfer from Phonsavang to Vientiane (DEM)	-	By two van
	<b>28 OCT (Sun)</b> 7:00 - 17:00	Transfer from Phonsavang to Vientiane (JICA Experts*)	-	By air plane

\* JICA experts will conduct interview and discussion with PDEM on 26<sup>th</sup> OCT.

d) 第3回セミナー (Savannakeht)

## Program for the Seminar on **Promotion of management on Lao Electric Power Technical Standards for**

"The Technical Cooperation for Improvement of Power Sector Management (IPSM)"

21 to 25 January 2013

for

Savannakhet Provincial Department of Energy and Mines (PDEM)

### 1. Goals of the Seminar

- To promote understanding of the LEPTS background, objectives and procedures in Provinces (PDEMs).
- To enhance the inspection skills mainly in the field of small hydropower and distribution in Provinces (PDEMs).

### 2. Objective of the Seminar

After the successful completion of the seminar, participants will be able to carry out inspection and examination of electric power facilities based on LEPTS.

### 3. Participants

<u>Organization</u>	<u>No. of Participants</u>	<u>Organization</u>	<u>No. of Participants</u>
DEM	10	PDEM	10
JICA Experts	4	Provincial divisions	8
(Mr. Nakanishi, Mr. Onozawa, Mr. Takahashi, Mr. Oda)		Provincial EDL	3
		Provincial private co.	6

\* Participants of Provincial divisions and Provincial private co. attend only in the morning on 22 JAN.

### 4. Venue and Agenda of the Seminar

Venue: Conference room, Phonephasot Hotel

B. Na Lau – Suntisouk Road, Kayson Phomevihan District, Savannakhet  
Province, LAO PDR

TEL: +856-41-212-158

Agenda: (Attached)

	Date & Time	Activities	Lecturer(s)	Remarks
Day 1	<b>21 JAN (Mon)</b> 8:00 - 17:00	Transfer from Vientiane to Savannakhet	-	By 3 mini vans
	<b>22 JAN (Tue)</b> 8:30 - 9:00	Registration	-	
Day 2	9:00 - 9:15 (15min)	Opening Remarks from DEM, PDEM, JICA Team	Representatives from DEM, PDEM and JICA Team	
	9:15-12:00 (2h30m)	Lecture on outline of <b>Electric Law, LEPTS</b> , procedures, and roles as regulator (15 min. coffee break during lecture)	Mr. Houmphanh	Purpose of the seminar, Electric Law and LEPTS 2 sets of LEPTS
	Taking picture / Lunch			
	13:30 - 14:00 (30min)	Presentation of <b>Action plan</b>	Mr. Matmanyvong	Based on the training in Japan
	14:00 - 16:30 (2h15min)	Lecture for <b>hydropower civil engineering</b> (15 min. Coffee break during lecture)	Dr. Phoukhong	
	<b>23 JAN (Wed)</b> 8:30 - 10:30 (2h)	Lecture for <b>hydropower electrical engineering</b> (15min. Coffee break)	Mr. Va	Introduction of check list and casebook. Topics on examination and inspection are highlighted.
10:45 - 12:00 (1h15m)	Lecture for <b>substation</b> Lecture for <b>transmission lines</b>	Mr. Viengxay Mr. Phouxay		
Lunch				
13:00 - 16:00 (3h)	Lecture for <b>distribution lines</b> (15 min. Coffee break)	Mr. Thammanoune		
Day 4	<b>24 JAN (Thu)</b> 8:30 - 11:30	Questionnaire (Questions collected and summarized) (15 min. Coffee break) Answering the questions by participants (continued)	ALL	Confirmation on procedures of examination using LEPTS, check list and casebook
	11:30-12:00	Evaluation of the Seminar	ALL	
	Lunch			
	13:30- 15:00	Presenting Certificate & Closing Remarks from DEM, JICA Team	Representatives from DEM and JICA Team	Certificate of completion will be granted.
	15:00 - 17:00	Evaluation of the Seminar	DEM and JICA Team	
Day 5	<b>25 JAN (Fri)</b> 8:00 - 17:00	Transfer from Savannakhet to Vientiane	-	By 3 mini vans

(6) 本邦でのカウンターパート研修

a) 第1回カウンターパート研修

**Program on the Counterpart Training for the Project  
for Improvement of Power Sector Management (IPSM) in Lao PDR (31 Aug - 14 Sep, 2011)**

Attachment IV (6) a

Date		Program (*The brackets inside shows the time duration of programs.)	Program Place (*Meeting time/spot : TBA)	Remarks	
31-Aug	Wed	AM Arriving in Japan (PM 14:00~17:30) JICA Briefing, etc	JICA Chubu (Seminar Room D2)		
1-Sep	Thu	(AM 10:00~12:00) JICA Orientation / Return Flight Meeting (PM 13:30~16:30) Introduction of Training Program Outline / Confirmation of preparations of the participants	JICA Chubu (Seminar Room C2) JICA Chubu (Seminar Room C2)		
2-Sep	Fri	(AM 9:30~12:00) LECTURE - Power Sector in Japan and Company Profile (PM 13:30~16:30) LECTURE - Outline of Electricity Regulatory Framework and Inspection in Japan	Chubu Electric Power Headquarters (Meeting Room 1-2) Chubu Electric Power Headquarters (Meeting Room 1-2)	(meet at hotel at 8:30 firstly) TRANSPORT: Subway, Walk LUNCH: BRING YOUR OWN.	
		(Left-side) Schedule in CHUBU for Hydropower Civil Engineering and Distribution Team (4 delegates: Dr. SENGVILAY (①-1), Mr. SYLYSAVATH (①-1), Mr. NAKHAVITH (①-2), Mr. VIRACHACK (①-2)) Coordinator : Kaori French (Mobile: 070-5553-1791)	(Right-side) Schedule in KANSAI for Hydropower Plant, Substation and Transmission Team (2 delegates: Mr. CHANTHA(②), Dr. BOUNSOU(②)) Coordinator : Akiko Watanabe (Mobile: 070-6668-6009)		
3-Sep	Sat	Holiday	Holiday		
4-Sep	Sun	Holiday	Move to Osaka (AM 9:55~ Departure from Nagoya station: PM 12:20 Arrival at Osaka station)	TRANSPORT: (②)Bullet Train	
5-Sep	Mon	(①-1: Civil Engineering (2 delegates)) (AM 9:30~12:00) LECTURE - Inspection Method of Hydropower Civil Engineering Facility (①-2: Distribution Line (2 delegates)) (AM 9:30~12:00) LECTURE - Inspection Method of Electric Distribution Facility (①-1: (2 delegates)) (PM 13:30~16:30) LECTURE - Ditto (①-2: (2 delegates)) (PM 13:30~16:30) LECTURE - Ditto	(②: (2 delegates)) (AM 10:00~12:30) LECTURE - Examination & Inspection Method: Example on written notification of construction to gov t (②: (2 delegates)) (PM 14:00~17:00) Q & A - Examination & Inspection Method: Transmission Designing	(①-1)(AM&PM) Chubu Electric Power Headquarters (Meeting Room 1-2) (①-2)(AM&PM) Chubu Electric Power Headquarters (Meeting Room 111) (②)(AM&PM) Kansai Electric Power, Power System Engineering Center (Nakanoshima Center Building)	TRANSPORT: (①-1, ①-2)Subway, Walk (②)Train, Walk LUNCH: (①-1, ①-2)PLEASE BRING YOUR OWN. (②)PLEASE BRING YOUR OWN.
6-Sep	Tue	(①-1 & ①-2: (4 delegates)) (AM9:30~10:00) LECTURE - Development of Human Resources and Education (AM10:15~12:00) SITE VISIT - Fault restoration simulator (①-1 & ①-2: (4 delegates)) (PM13:00~14:15) SITE VISIT - Dam simulator (PM14:30~16:30) SITE VISIT - Power history museum	(②: (2 delegates)) (AM10:30~12:00) SITE VISIT - On-the-job training (OJT) @ Sakurai line construction site (②: (2 delegates)) (PM14:00~16:00) SITE VISIT - On-the-job training (OJT) @ Kitakatsuragi substation	(①-1 & ①-2) (AM9:30~) Human Resource Development Center: Main Building 2F(Meeting Room 1) (AM10:15~) Power Distribution Training Center (PM13:00~) Engineering Work Training Center (PM14:30~) Power History Museum (②) (AM10:30~) 77kV Sakurai Line Construction Site (PM14:00~) 275kV Kitakatsuragi Substation	(①-1 & ①-2)* Wearing Sandal is NOT permitted. TRANSPORT: (①-1 & ①-2)JICA bus (②)Hired bus (KSA) LUNCH: (①-1 & ①-2)Bring your own, or company canteen @ 440 yen (②)BRING YOUR OWN.
7-Sep	Tue	(①-1 & ①-2 (4 delegates)) (AM11:00~12:00) SITE VISIT - Tokuyama Hydropower Construction Site - Inspection Method (①-1 & ①-2 (4 delegates)) (PM13:15~13:35) Tokuyama Dam - Viewing from viewing platform (PM13:50~14:20) Tokuyama Dam - Mechanical gate room (PM14:40~15:10) Tokuyama Dam - Construction site 1 or 3 (PM15:55~16:25) Tokuyama Dam - Construction site - Inspection Method	(②: (2 delegates)) (AM10:30~13:00) SITE VISIT - OJT at Uji hydropower plant (②: (2 delegates)) (PM14:30~16:00) SITE VISIT - Kisenyama pumped storage power plant	(①-1 & ①-2) (AM9:30~) Tokuyama Hydropower Plant Construction Site. (②) (AM) Uji Hydropower Plant (PM) Kisenyama Pumped Storage Power Plant	TRANSPORT: (①-1 & ①-2)Hired bus (KSA) (②)Train, Walk, Taxi LUNCH: All: BRING YOUR OWN.
8-Sep	Wed	(①-1: (2 delegates)) (AM10:00~11:00) SITE VISIT - Koshido Dam - Overview of Koshido civil engineering management center - Inspection method of the existing dam (Koshido) (PM12:30~13:30) SITE VISIT - Kuroda Dam - Training related to Dam Measurement (PM13:50~14:40) SITE VISIT - Mayumi Check Dam / Powerhouse (PM15:00~15:10) SITE VISIT - Yahagi Dam (①-2: (2 delegates)) (AM 9:30~12:00 / PM13:00~16:00) SITE VISIT - Inspection method of distribution line (Toyota branch)	(②: (2 delegates)) (AM10:30~13:00) SITE VISIT - OJT at Amagase hydropower plant (②: (2 delegates)) (PM14:00~16:00) FEEDBACK - Feedback through the OJT	(①-1) (AM&PM) Koshido Dam (①-2) (AM&PM) CEPCO Toyota Branch (②) (AM&PM) Amagase Hydropower Plant	(①-2)(Meet Mr. Wada at hotel lobby at 7:45) TRANSPORT: (①-1)JICA bus (①-2)Subway, Train, Taxi, Walk (②)Train, Walk, Taxi LUNCH: All: BRING YOUR OWN.
9-Sep	Fri	(①-1: (2 delegates)) (AM 9:30~12:00) LECTURE - Inspection Method of Hydropower Civil Engineering Facility (①-2: (2 delegates)) (AM 9:30~12:00) LECTURE - Inspection Method of Electric Distribution Facility (①-1: (2 delegates)) (PM 13:30~16:30) LECTURE - Ditto (①-2: (2 delegates)) (PM 13:30~16:30) LECTURE - Ditto * Final preparation of action plan is included.	(②: (2 delegates)) (AM10:00~12:30) LECTURE - Introduction of Kansai Electric Power Safety Regulations and accident response (②: (2 delegates)) (PM13:30~16:30) Final preparation of action plan	(①-1)(AM&PM) Chubu Electric Power Headquarters (Meeting Room 1-2) (①-2)(AM&PM) Chubu Electric Power Headquarters (Meeting Room 111) (②)(AM&PM) Kansai Electric Power, Power System Engineering Center (Nakanoshima Center Building)	TRANSPORT: (①-1, ①-2)Subway, Walk (②)Train, Walk LUNCH: (①-1, ①-2)?? (②)PLEASE BRING YOUR OWN.
10-Sep	Sat	Holiday	Back to Nagoya		
11-Sep	Sun	Holiday			
12-Sep	Mon	(AM9:30~PM12:00) Q & A (PM13:30~PM16:30) DISCUSSION - Intensive discussion for improvement of examination and inspection in Laos - Afterwards - Reception party hosted by CEPCO	Chubu Electric Power Headquarters (Meeting Room 1-2, 111)	(meet at hotel at 8:40 firstly) TRANSPORT: Subway, Walk LUNCH: BRING YOUR OWN	
13-Sep	Tue	(AM) Final preparation of action plan (PM13:30~15:00) PRESENTATION from delegates - Action plan (PM15:00~15:30) EVALUATION meeting (PM15:30~16:00) CLOSING CEREMONY	JICA Chubu (Seminar Room B1-2)		
14-Sep	Wed	Departure Day			

b) 第2回カウンターパート研修



**Program on the Counterpart Training for the Project  
for Improvement of Power Sector Management (IPSM) in Lao PDR (5 Aug - 20 Sep, 2012)**

Attachment IV (6) b

Date		Program (*The brackets inside shows the time duration of programs.)	Program Place (*Meeting time/spot : TBA)	Remarks
5-Sep	Wed	AM Arriving in Japan JICA Briefing, etc	JICA Chubu	
6-Sep	Thu	JICA Orientation / Return Flight Meeting (PM 14:30~16:30) Introduction of Training Program Outline / Confirmation of preparations of the participants	JICA Chubu JICA Chubu (seminar room D-2)	
7-Sep	Fri	(AM 9:30~12:00) LECTURE - Power Sector in Japan and Company Profile (PM 13:30~16:30) LECTURE - Outline of Electricity Regulatory Framework and Inspection in Japan	Chubu Electric Power Headquarters (Meeting Room 1-7) Chubu Electric Power Headquarters (Meeting Room 1-7)	TRANSPORT: Subway, Walk LUNCH: BRING YOUR OWN.
		(Left-side) Schedule in CHUBU for Hydropower Civil Engineering and Distribution Team (5 delegates: Mr. Lair PHIMPHISANE (DEM) Mr. Bounta CHIMMALA (Savannakhet PDEM) Mr. Itiyaphone MATMANYVONG(Savannakhet PDEM) Mr. Khamkeuth PHONSAVANH (Xiengkhouang PDEM) Mr. Soulideth PHANTHAVONGXAY (Xiengkhouang PDEM)	(Right-side) Schedule in KANSAI for Hydropower Plant, Substation and Transmission Team (3 delegates: 1. Mr. Houmphanh VONGPHACHANH(DEM) 2. Mr. Phouxy VIENGVIKAY (DEM) 3. Mr. Va YATHOTOU (DEM)	
8-Sep	Sat	Holiday		
9-Sep	Sun	Holiday		TRANSPORT: Bullet Train
10-Sep	Mon	(AM 9:30~12:00) LECTURE - Inspection Method of Hydropower Civil Engineering Facility  (PM 13:30~16:30) LECTURE - Inspection Method of Electric Distribution Facility	(AM 9:30~12:00) LECTURE - Inspection Method of Substation and Transmission Lines Facility  (PM 13:30~16:30) LECTURE - Inspection Method of Hydropower Electrical Engineering Facility	(AM&PM) Chubu Electric Power Headquarters (Meeting Room 1-7)  (AM&PM) Kansai Electric Power, Power System Engineering Center (27th-floor meeting room, Nakanoshima Center Building)
11-Sep	Tue	(AM11:00~16:00) SITE VISIT - Nishidaira Dam Control Office	(AM10:00~16:30) SITE VISIT - On-the-job training (OJT) @ Minami Himeji Substation site	[Chubu] (AM&PM) Nishidaira Dam Control Office  [Kansai] (AM&PM) Minami Himeji Substation
12-Sep	Wed	(3 delegates: Mr. Lair PHIMPHISANE (DEM) Mr. Itiyaphone MATMANYVONG(Savannakhet PDEM) Mr. Khamkeuth PHONSAVANH (Xiengkhouang PDEM)  (AM10:00~16:00) SITE VISIT - Koshido Dam - Overview of Koshido civil engineering management center - Inspection method of the existing dam (Koshido) - SITE VISIT - Kuroda Dam, Mayumi dam etc. (2 delegates: Mr. Bounta CHIMMALA (Savannakhet PDEM) Mr. Soulideth PHANTHAVONGXAY (Xiengkhouang PDEM)  (AM9:30~16:00) SITE VISIT- Owariasahi Customer Center - Inspection method of the existing distribution lines	(AM10:00~12:00) SITE VISIT - OJT at Ebisugawa Hydropower Plant (AM13:30~16:00) SITE VISIT - OJT at Keage Hydropower Plant	[Chubu] (AM&PM) Koshido Dam Control Office  [Chubu] (AM&PM) Owariasahi Dam Control Office  [Kansai] (AM) Uji Hydropower Plant (PM) Kisenyama Pumped Storage Power Plant
13-Sep	Thu	Human Resource Development Center (AM9:30~10:00) LECTURE - Development of Human Resources and Education (10:00~12:00) LECTURE - at power distribution training center  (14:00~16:00) FEEDBACK - Feedback through the OJT	(AM10:00~12:00) SITE VISIT - OJT at 77kV transmission line construction site (AM13:30~16:00) SITE VISIT - OJT at Uji Hydropower Plant	[Chubu] - Human Resource Development Center - Chubu Electric Power Headquarters (Meeting Room 118,119)  [Kansai] Uji city (AM) 77kV transmission line (PM) Uji Hydropower Plant
14-Sep	Fri	(AM 9:00~12:00) LECTURE - Examination and Inspection method (PDEM)  (AM 13:30~16:30) LECTURE - Examination and Inspection method (PDEM)	(AM 9:30~12:00) LECTURE - Examination and Inspection method (PDEM)  (AM 13:30~16:30) Preparation for PDEM Seminar	(AM&PM) Chubu Electric Power Headquarters (Meeting Room 118,119)  (AM&PM) Kansai Electric Power, Power System Engineering Center (27th-floor meeting room, Nakanoshima Center Building)
15-Sep	Sat	Holiday	Back to Nagoya	
16-Sep	Sun	Holiday		
17-Sep	Mon	Holiday		
18-Sep	Tue	(AM9:30~PM12:00) Q & A  (PM13:30~PM16:30) DISCUSSION - Intensive discussion for improvement of examination and inspection in Laos - Afterwards - Reception party hosted by CEPCO		Chubu Electric Power Headquarters (Meeting Room 109,110,111,112)
19-Sep	Wed	(AM) Final preparation of action plan (PM13:30~15:00) PRESENTATION from delegates - Action plan (PM15:00~15:30) EVALUATION meeting (PM15:30~16:00) CLOSING CEREMONY		JICA Chubu
20-Sep	Thu	Departure Day		

# 添付資料 V

合同調整委員会(JCC)資料

(1) 第 1 回 JCC

## **Minute of meeting**

### **First Joint Coordinating Committee (JCC) Meeting Project for the Improvement of the Power Sector Management IPSM in the Lao PDR**

The first Joint Coordinating Committee (JCC) meeting was held at the DOE conference room on 4 November 2010 about 14:00pm. Mr. Viraphone Viravong (Director General of DOE, MEM) and Mr. Togawa (Chief Representative of JICA Laos Office) as the co-chairpersons of the meeting, Experts, representatives from JICA, DOE, Electricite du Laos (EDL) a representative from Japanese Embassy to Lao is also participant and relevance agencies participated in the meeting.

Mr. Viraphone Viravong gave an opening speech indicating the purpose and objective of this project and also the detailed schedule of implementation for the project. The direct counterparts of the Project are the LEPTS Regulatory Unit (RU), the Electric Power Management Division, the DOE and the Ministry of Energy and Mines (MEM). The Division is in charge of examinations and inspections of power facilities, legal work related to the Electricity Law and work for energy savings. JICA experts set up the plan for follow up of the schedule in each period of work for examination and inspection project in accordance with the guidelines of the Power Technical standard of Lao PDR, this implement is for improvement of the Power Sector Management IPSM in the Lao PDR.

Mr. Togawa, Chief Representative of JICA Laos Office, expressed his thanks to the DOE and also staff who helped to prepare the work plan for the project with good cooperation and support. To implement this project by examination and inspection of many projects from previous work, the Government of Japan is always to assist on the part of Power sector development in Laos such as improvement of the Capacity building of the Lao Government staff and also completed of the establishment for IPSM project with the setting-up of some regulatory documents which will be a reference for the basic guidelines for examination and inspection in the Power sector.

The Japan International Cooperation Agency's (JICA's) Technical Cooperation Project, entitled "the Project for Improvement of Power Sector Management (IPSM) in the Lao People's Democratic Republic (Lao PDR)", commenced from 25 October 2010.

Japanese Experts with various backgrounds are working in the same office as the LEPTS RU members and sharing information with good communication.

The Main purpose of meeting is:

1. To Propose the objective and overall expectations of the project
2. To Propose the general IPSM work plan, period and detail of implementation.
3. Outline the Structure of implementation plan for IPSM project
4. Brainstorming and discussion about the project implementation plan to obtain support for project implementation

During the meeting there were discussions in detail of problems and sharing of ideas on the following sections:

- Hydro Civil
- Hydro electrical
- Distribution
- Transmission
- Substation

- The work plan detail of this project is focused on the improvement of the guidelines for examination and inspection of Hydro civil and electrical sections to suit of the real situations and can be implemented.

The JICA Expert explained about the following:

- the related sector for implement this project such as DOE/MEM, EDL and DEPD
- The purpose and goal of this project and the preparation of the plan for case book
- Prepare the pre-seminar at provincial level to promote the guidelines of examination and inspection of project for staff's understanding and implementation.
- Explanation of the implementation plan in each period and action plan
- Department of Electricity's (DOE's) examination and inspection capabilities are enhanced.
- The capacity of DOE for supervising Provincial Department of Energy and Mines is enhanced.
- An improved understanding of the LEPTS in target provinces.

The counterparts of the Project are the LEPTS Regulatory Unit (RU), the Power Management Division, the DOE and the Ministry of Energy and Mines (MEM). The Division is in charge of examinations and inspections of power facilities, legal work related to the Electricity Law and work for energy savings.

Following the Project Expert's presented about the objective and work plan of this project, the participants gave the following comments:

1. Mr. Chantho Milattanapeng, Head of Environment and Social Division, commented on the guidelines for monitoring and management of examination and inspection of IPSM project. The guideline does not cover for future for the thermal power, because Laos will have some power projects that will be generated by thermal power and renewable energy.
2. Mr. Viraphon Viravong Director of DOE, has some suggestion to the expert about on the job training for all the technical staff DOE which electric power management division that will improve the strength for implementation of technical standard IPSM.
3. Mr. Houmphanh Vongphachanh, Deputy Head of electric power management division and also the project manager for IPSM, further informed the meeting about the purposed of this project on the following:
  - Improvement of the regulatory function for reinforced operation of the Lao Electric Power Technical Standard (LEPTS) and authorization and approval of power projects
  - The project is developing the document under the technical standard and also prepares the guidelines for examination and inspection.
  - The capacity building for inspection for all staff of EPMD and assign the work is each field to responsible for inspection and management.
  - Prepare the training program by related to the EDL training center at Sokpaloung and also consult with JICA expert in EDL Training center.
4. Mr. Bounlop, Head of EDL training center informed the meeting that the training center would support and cooperate with the project, as in the previous STEP II project with Lao power technical standard.
5. Mr. Bounoum, Deputy Director of EDL commented about the case study of each project that will be included in this project. He suggested that the case book should divide the detail by each case study of each field.
6. Mr. Viengxay Chantha, member of regulator unit of EPMD, commented on the improvement of the guideline of examination and inspection related to the real situation that can be implemented.

7. Mr. Viraphon, DOE-DG suggested that there should be a detailed plan and try to make it complete with our target and also be clear about the work duty of DOE, EDL and DEPD

8. The representative from Planning and Investment office requested the project to indicate the project budget for each period of implementation and also time and number of participants attending seminars and details of the promotion of this project , and plans for the import of equipment for this project.

9. Mr. Viraphon proposed to the IPSM to support for Software and Hardware to implement this project to be successful.

The Activity Plan was explained by the Experts and, thereafter, discussion was made on the contents of the basic policy and schedule of the Project. A strong expectation to the Project was expressed by Mr. Viraphonh in the closing remarks of the meeting. Before the end of closing speech, Mr. Viraphone expressed sincere thanks and closed the meeting at 15:30pm

Vientiane, 4 November 2010  
Santisouk Phimpachanh

**MEM – DOE**

## Activity Plan on the Project for Improvement of the Power Sector Management (IPSM) in the Lao PDR

November 2010

Project Period: October 2010 - March 2013

November 2010

**MEM – DOE**

## Objective and goal of the Project

< Project Objective >  
Improvement of the regulatory function for reinforced operation of the LEPTS, and authorization and approval of power projects.

< Project Goal >  
Regulatory function in the power sector is enhanced.

< Overall Goal >  
The number of electric power facilities that suit LEPTS increases and the electric power is stably supplied.

November 2010

**MEM – DOE**

## Project Outputs

- Output 1
  - DOE’s examination and inspection capabilities are enhanced.
- Output 2
  - The capacity of DOE for supervising PDEM is enhanced.
- Output 3
  - Understanding on LEPTS in target provinces is improved.

November 2010

**MEM – DOE**

## Indicators for the Project Objective

- The number of reviewed project documents (F/S, D/D, etc.) by DOE based on the practical examination instructions.
- The number of inspection activities by DOE based on the practical inspection instructions.
- The number of reviewed project documents (F/S, D/D, etc.) by PDEM based on the practical inspection instructions.
- The number of electric power facilities reports from PDEM to DOE.
- The number of internal inspection activities by EDL based on the practical inspection instructions.
- Electric power facilities reports from EDL to DOE include the matter related to LEPTS.

November 2010

**MEM – DOE**

## Implementing Agencies and Target Group

- Implementing Agencies
  - Laos : DOE and PDEM
  - Japan : JICA
- Target Group (beneficiary)
  - DOE (primary)
  - EDL (Secondary)

November 2010

**MEM – DOE**

## List of Japanese Experts

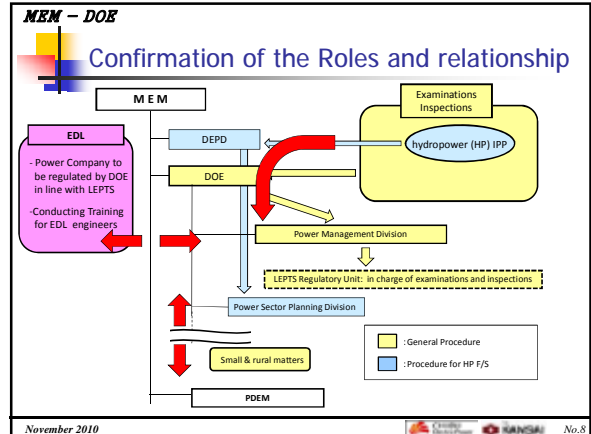
Name	Organization	Job Title
Mr. Masahiko MIURA	CEPCO	Chief Advisor/ Hydropower Civil Engineering 1
Mr. Yasuhiro KAWAKAMI	CEPCO	Deputy Chief Advisor/ Hydropower Civil Engineering2 / Institutional and Organizational Issues
Mr. Hirofumi FUJITA	KEPCO	Hydropower Electrical engineering
Mr. Tatsumi FUKUNAGA	CEPCO	Distribution Lines 1
Mr. Hideki WADA	CEPCO	Distribution Lines 2
Mr. Yoshio MARUOKA	KEPCO	Transmission Lines
Mr. Masao NAKAI	KEPCO	Substations
Mr. Masato ONOZAWA	CEPCO (Pioneer-research)	Development of Training 1
Ms. Tomoko MIZUYORI	CEPCO (Pioneer-research)	Development of Training 2
Yosuke SAWAI	CEPCO	Coordinator/ Assistant Hydropower Civil Engineering

November 2010

**MEM – DOE**

## Basic Policy of the Project to be discussed and confirmed

November 2010 No.8



**MEM – DOE**

### Relationship and Roles (1)

- EDL is:
  - ✓ An Electric power company to be regulated.
  - ✓ Partner to promote LEPTS.
- Proposed relationship with EDL in the Project:
  - ✓ Participation in the field training as necessary.
  - ✓ Technical discussion.
  - ✓ Others ?

November 2010 No.9

**MEM – DOE**

### Relationship and Roles (2)

- Roles between Regulatory Unit (Power Management Division) and other divisions
  - ✓ Power Sector Planning Division
    - in charge of Feasibility Study (F/S)
  - ✓ Rural Electrification Division
    - in charge of the formulation and monitoring of rural electrification project

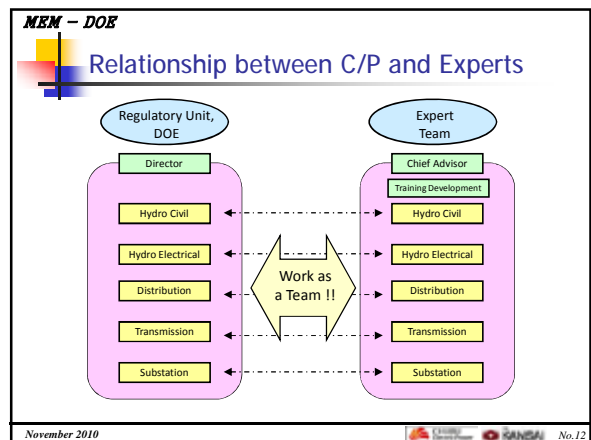
November 2010 No.10

**MEM – DOE**

### Relationship and Roles (3)

- Relationship between PDEMs
  - ✓ DOE will assist PDEMs to conduct:
    - Field inspections.
    - Reporting to MEM.
  - ✓ DOE with assistance of the Experts will hold seminars to promote understanding of LEPTS at model provinces (PDEMs).

November 2010 No.11





**MEM – DOE**

## Comprehensive schedule of the Project

November 2010

**MEM – DOE**

## Flow of the Project

November 2010

**MEM – DOE**

## Contents of the Review Report

Table of contents	Contents
1. Background	- Results of STEP 1 and STEP 2, and factors towards the Project
2. Legal framework around the LEPTS	- Outline of the LEPTS, Guideline, Safety Rules, examination and inspection manuals
3. Examination and inspection setup	- Setup for examinations and inspections at the DOE and PDEMs up to know
4. Current status of examinations and inspections 1) Hydropower civil engineering 2) Hydropower electrical engineering 3) Distribution 4) Transmission lines/ substations	- Results of the fact-finding study of examination and inspection in each field of technology
5. Current status of human resource development	- Current status of human resource development through the EDL LEPTS training etc.
6. Framework of instructions and casebooks	- Easy-to-understand and easy-to-use instructions, and casebooks of genuine value
7. Recommendations	Recommendations (including PDM issues as necessary)

November 2010

**MEM – DOE**

## Instructions and Case books

- Based on the LEPTS, Guideline, Safety Rule, Examination/ Inspection Manual, and experience

Relation between the PO	Name
PO 1: DOE's examination and inspection capabilities are enhanced.	1-3 Examination and inspection instructions Case book
PO 2: The capacity of DOE for supervising PDEM is enhanced.	2-1 Inspection instructions 2-3 Case book 2-5 Revision of forms used for inspection records by PDEMs
PO 3: Understanding on LEPTS in target provinces is improved.	3-2 Case book

November 2010

**MEM – DOE**

## Seminars to Promote Understandings of the LEPTS at Model Provinces

- Participants: PDEMs, DOE, EDL and Experts
- Contents of the seminar:
  - Lecture on the objective and outline of the LEPTS
  - Field training for PDM's inspections
- Pre-Seminar in Vientiane: to understand the Project purpose among DOE, LEPTS trainers (in February 2011)

November 2010

**MEM – DOE**

## Thank you very much for your attention!

November 2010

(2) 第 2 回 JCC

MINUTES OF MEETING  
FOR  
THE SECOND JOINT COORDINATING COMMITTEE  
OF  
THE JAPANESE TECHNICAL COOPERATION PROJECT  
FOR  
THE IMPROVEMENT OF POWER SECTOR MANAGEMENT (IPSM)  
IN  
THE LAO PDR

The Second Joint Coordinating Committee of the Japanese Technical Cooperation Project for the Improvement of Power Sector Management (IPSM) in the Lao PDR (hereinafter referred to as "Project") was convened on the 14<sup>th</sup> November 2011 at the meeting room of the Department of Electricity (hereinafter referred to as "DoE"), Ministry of Energy and Mines (hereinafter referred to as "MEM") of the Lao PDR.

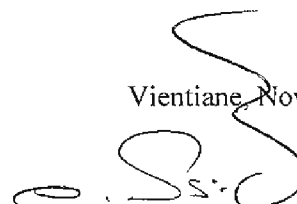
The Japanese side and the Lao side discussed issues related to the Project and exchanged views with other stakeholders that attended the meeting. Both sides further discussed the actions to be taken in the second phase of the Project.

As a result of the discussion, the Lao and Japanese sides agreed upon the matters referred to in the document attached hereto.

Vientiane, November 14, 2011




Mr. Hirokazu NAKANISHI  
Leader,  
IPSM Project



Mr. Viraphonh VIRAVONG  
Vice Minister,  
Ministry of Energy and Mines, Lao  
PDR

Witness:



Dr. Masato TOGAWA  
Chief Representative,  
JICA Laos Office

## ATTACHMENT

### **1. Recognition of Work Progress and Achievement**

Both Lao and Japanese sides carried out the technical cooperation project as stipulated in the Project Design Matrix mutually agreed on July 16, 2010. Work progress as of October 31, 2011, was presented as shown in ANNEX-1. The achievements of the Project were acknowledged by the attendees.

### **2. Recognition of Actions Taken in the 2<sup>nd</sup> year of the Project**

Both sides agreed that the following issues are important for the implementation of the 2<sup>nd</sup> year of the Project: (1) to focus on the most critical examination and inspection issues regarding IPP projects; (2) to reconfirm the relationship among the DoE, EDL and GoL (MEM); and (3) to strengthen the regulatory capabilities of the DoE and PDEM. The Lao side requested that the primary focus of the activities in the 2<sup>nd</sup> year of the project shall be to deepen the understanding of technical matters related to LEPTS and its procedures. Particularly, that the use of LEPTS by DoE members during examinations shall be greatly strengthened in technical and administration aspects. JICA stated that it recognized that the purpose of restructuring the Ministry is to enhance the administrative capacities of respective divisions. It requested the Ministry to increase the manpower of the regulatory division as its importance will grow in coming years.

### **3. Revision of LEPTS Guidelines and Relevant Manuals**

The Lao side stressed that LEPTS Guidelines and relevant manuals should be updated and modified to match the organizational and administrative changes in the MEM. JICA agreed with the comment and stated that it expected the Lao side to make the necessary updates and modifications, as it is the government that is responsible for these documents. Both sides agreed that these documents shall be updated and modified by the Lao side with assistance from JICA experts.

### **4. Development of Annex to be Attached to MOU, PDA and/or CA**

The experts asserted that LEPTS must be adopted by all electric power sector stakeholders in the Lao PDR. In order to promote LEPTS more effectively, the GoL must clarify the procedures of the approval process as well as LEPTS. Japanese experts further propose that an Annex (or excerpt) of LEPTS is developed and provided to the IPP to clarify procedures. Such a document would be attached to MOU, PDA and/or CA, depending on the current status of the on-going IPP project. DEPD shall invite all stakeholders of IPP projects to organize a meeting to clarify approval procedures and LEPTS requirements. The Japanese side stressed that the LEPTS addendum shall be prepared by the Lao side with a help from the experts.



### **5. Practical Instruction and Casebook**

The Lao side emphasized that practical guides shall be used not only for inspections but also examinations. The guides and casebook shall be completed and used by both the DoE and PDEM. The Lao side made a request to the Japanese side that more technical contents that suit examination are updated toward the end of the project. Both sides agreed that the practical guides shall be translated into the Lao language by the Lao side.

### **6. Work Plan**


Both sides agreed to work closely to take the DoE's requests into consideration when completing the work plan for the 2<sup>nd</sup> year of the Project, which will be submitted by January 2012.



Annex-1: Presentation of 2<sup>nd</sup> JCC (Handout)  
Annex-2: Attendance Lists

## 2<sup>nd</sup> JCC on the Project for Improvement of the Power Sector Management (IPSM) in Lao PDR


November 14, 2011





## Contents of Presentation


- Outline of Project
- Progress of Project
- Actions to be taken in the 2<sup>nd</sup> Phase of IPSM





## Description of Project


Name: Project for Improvement of the Power Sector Management (IPSM) in Lao PDR  
 Duration: October 2010 - March 2013  
 Implementing Agencies: DOE and PDEM (Laos)  
 JICA (Japan)  
 Target Group: DOE (Primary) & EDL (Secondary)





## Description of Project

**Project Purpose:** Regulatory function in the power sector is strengthened  
**Overall Goal:** The number of electric power facilities that suit LEPTS increases and the electric power is stably supplied









## Project Description

**Output 1:**  
DOE's examination and inspection capabilities are enhanced.

**Output 2:**  
The capacity of DOE for supervising PDEM is enhanced.


**Output 3:**  
Understanding on LEPTS in target provinces is improved.



## Plan of Operation (Original)

Project Phase	Phase 1				Phase 2							
Calendar Year	2011				2012				2013			
Month	10	1	4	7	10	1	4	7	10	1	4	
Inception/ Work Plan Discussion, etc.	[Green bar from Oct 2010 to Mar 2011]											
Review DOE/LEPTS activities, etc.	[Green bar from Oct 2010 to Mar 2011]											
Preparation of Instruction/ casebook	[Black bar from Oct 2010 to Mar 2011]											
OJT on Examination and Inspection (implementation)	Pre Seminar		Chiang Mai			Savannakhet	Xeng Nongxouang					
Counterpart Training in Japan	JCC#1	Midway Test	Progress Rpt 1		JCC#2	Progress Rpt 2	Progress Rpt 3		JCC#3	Progress Rpt 4	JCC#4	
LEPTS Summary	Work Plan										Completion Rpt 2	



### Project Team (DOE)

Name	Job Title
Mr. Bouthep MALAYKHAM	Director of Division
Mr. Houthphanh VONGPHACHAN	Deputy Director (IPSM Manager)
Mr. Veingsay CHANTHA	Substations, Hydropower Electrical Engineering, (Civil Engineering)
Mr. Thammanoune NAKHAVITH	Distribution Lines, Private Company
Ms. Santisouk PHIMPACHANH	Ministerial Ordinance, Transmission Lines
Dr. Xayphone BOUNSOU	Ministerial Ordinance, Transmission Lines, Nuclear Power, (Civil Engineering)
Dr. Phoukhong SENGVILAY	Civil Engineering
Mr. Phouxay VIENGVIXAY	Distribution Lines, Private Company

November 2011 No.7

### Project Team (Japanese Experts)

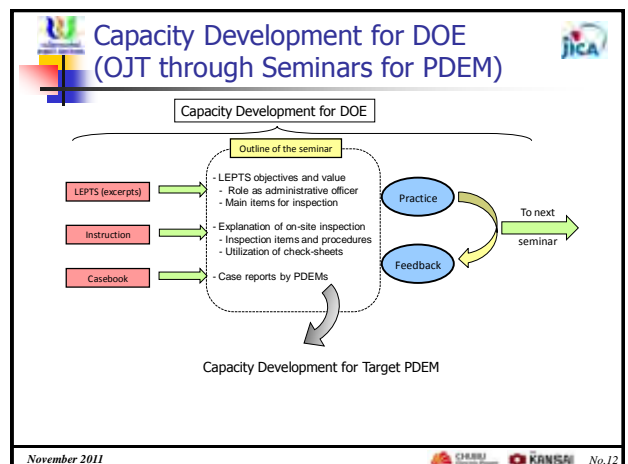
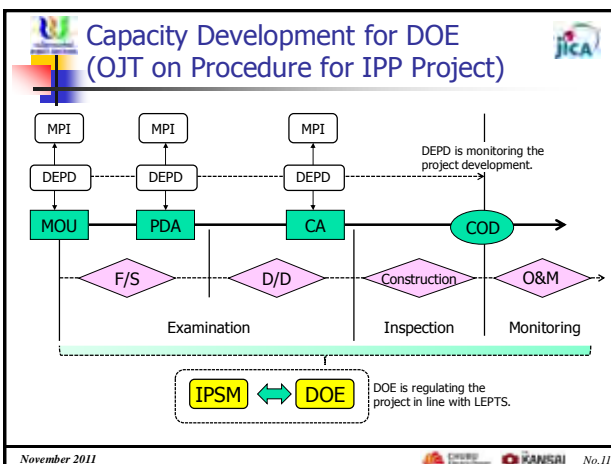
Name	Organization	Job Title
Mr. Hirokazu NAKANISHI	CEPCO	Chief Advisor/ Hydropower Civil Engineering 1
Mr. Yasuhiro KAWAKAMI	CEPCO	Deputy Chief Advisor/ Hydropower Civil Engineering2 / Institutional and Organizational Issues
Mr. Hirofumi FUJITA	KEPCO	Hydropower Electrical engineering
Mr. Hirokazu KINOSHITA	KEPCO	Hydropower Electrical engineering
Mr. Koji SHIKIMACHI	CEPCO	Distribution Lines 1
Mr. Hideki WADA	CEPCO	Distribution Lines 2
Mr. Yoshio MARUOKA	KEPCO	Transmission Lines
Mr. Kenta TAKAHASHI	KEPCO	Substations

November 2011 No.8

- ### Indicators for Project Objective
- The number of reviewed project documents (F/S, D/D, etc.) by DOE based on the practical examination instructions.
  - The number of inspection activities by DOE based on the practical inspection instructions.
  - The number of reviewed project documents (F/S, D/D, etc.) by PDEM based on the practical inspection instructions.
  - The number of electric power facilities reports from PDEM to DOE.
  - The number of internal inspection activities by EDL based on the practical inspection instructions.
  - Electric power facilities reports from EDL to DOE include the matter related to LEPTS.
- November 2011 No.9

### Progress of the Project

November 2011 No.10




**Project Description**

**Output 1:**  
DOE's examination and inspection capabilities are enhanced.

**Output 2:**  
The capacity of DOE for supervising PDEM is enhanced.


**Output 3:**  
Understanding on LEPTS in target provinces is improved.

November 2011  No.13

**Output 1: DOE's examination and inspection capabilities are enhanced.**

**Indicators:**


- The Practical examination and inspection instructions are formulated.
- Examination of documents and on-site inspections are conducted properly based on LEPTS.
- Improvement of institutional arrangement for regulatory function of DoE.

November 2011  No.14

**Indicator a & b: (Practical instructions for inspection)**

**Achievement:**

- The Instructions were formulated and being modified through OJTs and actual inspections, and
- The Instructions are being utilized for field OJTs and inspections.

November 2011  No.15


**Indicators a & b: OJTs and Inspections Using the Instructions Developed**

**OJT Site Inspection Results**

Date	Project Name (Stage)	Technical field for OJTs				
		Hydro Civil	Hydro Electrical	Trans-Mission	Sub-station	Distribution
2-4, Feb. 2011	Paksan-Pakbo Transmission Project (Under construction)			○		
21-23, Feb. 2011	Theun-Hinbun Hydropower Expansion (Under Construction)	○	○	○	○	
18-20, Feb. 2011	Nam Ngum 2 Hydropower (Existing)	○	○			
25-26, May 2011	Phonhong, Vang Vieng Distribution (Existing and COD)					○

**Inspection Results**

Date	Project Name (Stage)	Technical field for OJTs				
		Hydro Civil	Hydro Electrical	Trans-Mission	Sub-station	Distribution
18-19 Aug. 2011	Theun-Hinbun Hydropower Expansion (Inspection Prior to First Impounding)		○		○	
14-16, Jun. 2011		○				


November 2011  No.16

**Indicator a & b: (Practical instructions for inspection)**

**Tasks to be carried out:**

- More focus on examination: Instructions should be used for examinations and be modified as necessary, and
- Deeper technical understanding is necessary for C/P to carry out proper inspection & examination.


→ One of the most critical issues

November 2011  No.17



**Indicator c: Improvement of institutional arrangement for regulatory function of DoE.**

**Achievement:**


- Inspection procedures (e.g. receiving Forms, conducting inspections and issuing a completion letter with minutes of meeting, etc.) clarified and much improved, and
- The procedures became a "routine" for proceeding inspection.



November 2011  No.18



 **Obstacles still remains in examination and inspection (Developer's Perspective)** 


- Consensus between GoL and IPP (i.e. technical issues)
  - Level of communication b/w GoL and developer varies project to project on LEPTS and its Guidelines, and
  - Inconsistent adoption of LEPTS to the projects already signed MOU (interim measures on LEPTS are arbitrary)
- Role difference b/w DEPD and DOE Unclear
  - DEPD works as focal point for IPP development in Lao PDR, DOE responsible for all technical matter on LEPTS,
  - Lack of communication between DEPD and DOE for on-going projects (e.g. status, scheduling, etc.)
- DOE: Deeper technical understanding needed on design concept & requirement, etc.



November 2011  No.19

 **Indicator c: Improvement of institutional arrangement for regulatory function of DoE.** 

**Tasks to be carried out:**


- Procedures from the beginning (F/S) to end (COD and O&M) clarified,
- Scheduling (e.g. status, examination & inspection, etc) of on-going projects be shared among PEDE, DOE and IPP,
  - ➡ One of the most critical issues



November 2011  No.20

 **Output2: The capacity of DOE for supervising PDEM is enhanced.** 

**Indicators:**


- a. LEPTS trainers' ability as trainer is improved.
- b. The practical examination and inspection instructions are formulated.
- c. Inspection recording forms for PDEM are revised.
- d. Case books are continuously revised.



November 2011  No.22

 **Indicator a: LEPTS trainers' ability as trainer improved** 

**Achievement:**


- The ability for LEPTS training has been improving through seminars, OJTs and inspections, and
- Teaching capacity improved (handouts prepared, translated into Lao Language, and training module taught w/o experts' help).



November 2011  No.23

 **Indicator a: LEPTS trainers' ability as trainer is improved.** 

**Tasks to be carried out**

- The regulatory unit continues to provide technical support for inspection and examination when requested by PDEM (as DOE helped Nam Nhon HEP), and
- Additional LEPTS seminars scheduled in Feb. and June 2012.

November 2011  No.24


 **Indicator b: The practical examination and inspection instructions are formulated.** 



**Achievement:**

- The Instructions prepared by the Experts are being translated into Lao language and modified for PDEM inspectors by EPMD.

**Tasks to be carried out:**

- The Instruction shall be adopted by PDEM (monitoring).

November 2011  No.25



 Indicator c: Inspection recording forms for PDEM are revised. 



**Achievement:**

- Inspection recording forms not yet confirmed.

**Tasks to be carried out:**

- Continue discussion on the issue.

November 2011   KANSAI No.26



 Indicator d: Case books are continuously revised. 



**Achievement:**

- The case books with good and bad cases were formulated and being revised, adding new incidents.

**Tasks to be carried out:**



- Updating the casebooks based on actual incidents observed from OJT and inspections.



November 2011   KANSAI No.27

 Output 3: Understanding on LEPTS in target provinces is improved. 

**Indicators:**



- a. Seminars on LEPTS are conducted in target provinces.
- b. Participants' understanding on LEPTS is improved.
- c. User-friendly case books are formulated.
- d. Case books are continuously revised.



November 2011   KANSAI No.28

 Indicator a: Seminars on LEPTS are conducted in target provinces. 

**Achievement:**

- The first seminar for PDEM was organized in Champasak province in June 2011,
- Invited PDEM engineers for a field-based practical OJT with focus on inspection of CE & DL,
- Other participants include central & provincial EDL, EDL Training Center and local contractors,
- All training modules carried out by DOE in Lao language (handout, field trip and Q&A session), and
- 2 more LEPTS seminar scheduled in Savanaket and Xieng Koung.

November 2011   KANSAI No.29



 Indicator b: Participants' understanding on LEPTS is improved. 



**Achievement:**

- 2 Engineers from Champasak PDEM participated in the counterpart training in Japan to deepen their technical understanding of LEPTS.

**Tasks to be carried out:**

- Monitor the changes and improvement of inspection and examination in the target provinces,

November 2011   KANSAI No.30



 Indicator c & d: User-friendly case books are formulated and are continuously revised. 

**Achievement:**

- The case books with good and bad cases were formulated and being revised adding new incidents.

**Tasks to be carried out:**

- Continue revisions for updating the casebook.

November 2011   KANSAI No.31

**Actions to be taken  
in the 2<sup>nd</sup> Phase of the IPSM**

November 2011

**Tasks as short-term issues in the  
second phase of IPSM**

- To focus on the most critical issues on examination and inspection for IPP projects.
- To reconfirm the relationship between EDL and GoL (MEM), and
- To strengthen the regulatory capabilities of PDEM.

November 2011

**Most critical issues on examinations  
and inspections for IPP projects**

- A) Consensus between GoL and developers on LEPTS and related Guidelines at the early stage of projects (before MOU),
- B) Sharing accurate scheduling of examinations and inspections, and
- C) Deeper technical understanding for (at least) design concept following the LEPTS articles as regulators.

November 2011

**Institutional framework (questions)**

The diagram illustrates the institutional framework. At the top is the 'Developer'. Below it is a box containing 'DEPD' and 'DOE(GOL engineer)'. Inside this box, 'DEPD' is further divided into 'Technical', 'Financial', and 'Environmental'. To the right of this box is a separate box for 'LEPTS Examination and Inspection'. A green arrow labeled 'Official approach' points from the 'DEPD' box to the 'LEPTS Examination and Inspection' box. A pink arrow labeled 'Direct access or not?' points from the 'Developer' box to the 'DOE(GOL engineer)' box. Below the 'DEPD' box is a box for 'Min. of Natural Resources and Environment'.

< Issues to be confirmed >

- Can DEP give a one-stop service to developer?
- Can DOE access to developer (two routes)?
- How the developer access to the information on LEPTS ?
- How to develop examination/ inspection schedule?

November 2011

**Measures for the most critical issues  
- Information sharing and scheduling**

- Observed issue is not the framework itself but the lack of information sharing between DEP and DOE for the developer to access the LEPTS and its procedures.

Experts will support:

- GoL to organize a meeting to inform the developer of the whole procedure of the development and the contents of LEPTS at an early stage (before MOU),
- ERD to develop a standardized explanation of LEPTS and its procedure annexed to CA, and
- DEP and DOE to hold regular meetings (e.g. quarterly) to confirm the project progress for DOE to prepare examination/ inspection schedule.

November 2011



**Measures for the most critical issues  
- Deeper technical understanding**

- DOE and PDEM became confident to prepare a set of inspection procedure from receiving Forms, implementing inspections and issuing the letter of completion, and
- It is necessary for the DOE and PDEM to acquire deeper technical understanding (design concept) of LEPTS for examinations.

Experts will continuously provide:

- OJTs for examination using past FS/DD reports, and
- Technical advise for actual examinations and inspections following the LEPTS Articles as usual.

November 2011


 Relationship between EDL and DOE 



- EDL was a partner to formulate LEPTS and Guidelines under STEP I and STEP II.
- EDL is a power company to be regulated by GoL (MEM).

↓

It is proposed that DOE should:

- Start technical discussion to confirm LEPTS Articles and EDL regulations with EDL technical department and training centers, and
- Review past (EDL's self-imposed) examination/ inspection records

November 2011  No.43


 Regulatory Capabilities of PDEMs 

- PDEMs are responsible for examination and inspection on provincial level, and
- It is necessary for PDEMs to acquire the procedure for examination and inspection with technical skills.

↓

DOE will:



- Hold 2 more seminars on LEPTS understanding in Savannakhet and Xieng Khouang, and
- Provide technical advises for PDEMs to conduct examinations and inspections together with reporting skills based on PDEM's request.


November 2011  No.44


 Proposed Date and Venue of the LEPTS Understanding Seminar in 2 Provinces 

1. 21 to 23 February 2012  
(Venue: Savannakhet PDEM)
2. 19 to 21 June 2012  
(Venue: Xieng Khouang PDEM)

November 2011  No.45

 Thank you very much for your attention!

November 2011 



List of participants for the 2<sup>nd</sup> JCC meeting on the Technical cooperation  
on the project for improvement of power sector Management in the Lao P.D.R.

November 14, 2011 at DOE, Vientiane.

No	Name	Position	Organization	Telephone	Signature
1	Viraphanh Viravong	Vice Minister	HEM	55511374	
2	Hattanasit Srasulath	DDG	DOE	55511827	
3	Boun Gum S	D.M.D	DOE	22243374	
4	Phimphone Louavong	DOE Engineer	DOE	2240187	
5	Vienthan CHANTHAT	Counterpart	DOE	55664393	
6	Mr. Khamchanh Phommavong	Technical	Ministry of Energy	22243374	
7	Ms. Sompalame Vongkha	Deputy Division	DOE	22243374	
8	Bouloip Thepboualy	Manager Training Center	BDL	55622850	
9	Ms. Saisasouk Phommavong	Counterpart	DOE	22243374	
10	Phoukhy SENGVILAY	Counterpart	DOE	77150926	
11	Mr. Manopaphath Pathirany	Engineer	DOE	22000215	
12	Mr. Vajjathet	Engineer	DOE	55102377	
13	Mr. Kaysith Sadetfan	JICA staff	JICA	020.56414915	
14	Mr. Thammavong Phommavong	(Power sector) (Counterpart contribution)	DOE	55622850	
15	Mr. Lait PHIMPISANE	Engineer	DOE	22243374	




List of participants for the 2<sup>nd</sup> JCC meeting on the Technical cooperation  
on the project for improvement of power sector Management in the Lao P.D.R.

November 14, 2011 at DOE, Vientiane.

No	Name	Position	Organization	Telephone	Signature
1	Nakanishi, H	Chief Advisor	JICA - Chubu	588/3800	伊西
2	Masato ONOZAWA	Development of Training	JICA - expert for IPSP		
3	Hideki WADA	Distribution Lines	JICA - expert for IPSP		和田 英樹
4	Koji ODA	Assistant Hydropower Civil Engineering	JICA - expert for IPSP		
5	Hirokazu Kinoshita	Hydropower Electrical	JICA - expert for IPSP		木下 浩一
6	Kazuo Takahashi	Substation	JICA - expert for IPSP		高橋 健太
7					
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11					
12					
13					
14					

List of participants for the 2<sup>nd</sup> JCC meeting on the Technical cooperation  
on the project for improvement of power sector Management in the Lao P.D.R.

November 14, 2011 at DOE, Vientiane.

No	Name	Position	Organization	Telephone	Signature
1	M. TEGAWA	Chief. Rep.	JICA		
2	S. Yuzurio	Senior Rep.			
3	N. Hashimoto	JICA Expert			
4					
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(3) 第 3 回 JCC



MINUTES OF MEETING  
FOR  
THE THIRD JOINT COORDINATING COMMITTEE  
OF  
THE JAPANESE TECHNICAL COOPERATION PROJECT  
FOR  
THE IMPROVEMENT OF POWER SECTOR MANAGEMENT (IPSM)  
IN  
THE LAO PDR

The Third Joint Coordinating Committee of the Japanese Technical Cooperation Project for the Improvement of Power Sector Management (IPSM) in the Lao PDR (hereinafter referred to as "Project") was convened on December 4, 2012 at the meeting room of the Department of Energy Management (hereinafter referred to as "DEM"), Ministry of Energy and Mines (hereinafter referred to as "MEM") of the Lao PDR.

The Japanese side and the Lao side discussed issues related to the Project and exchanged views with other stakeholders that attended the meeting. Both sides further discussed future activities and draft roadmap.

As a result of the discussion, the Lao and Japanese sides agreed upon the matters referred to in the document attached hereto.

Vientiane, December 18, 2012

中西浩和

Mr. Hirokazu NAKANISHI  
Chief Advisor  
JICA IPSM Project



Mr. Khammaphy INTHIRATH  
Vice Minister  
Ministry of Energy and Mines  
Lao PDR

## ATTACHMENT

### 1. Recognition of Work Progress

Both Lao and Japanese sides carried out the technical cooperation project as stipulated in the Project Design Matrix mutually agreed on July 16, 2010. Work progress as of November 30, 2012, was presented as shown in ANNEX-1.

### 2. Recognition of Proposal on Future Activities (Presentation of the Draft Roadmap)

The Japanese side proposed a draft of post-Project roadmap showing future activities with timeframes of three, six, and ten year periods as shown in ANNEX-1. The Japanese side explained the proposed roadmap needed to be taken into consideration for developing an effective regulatory framework of the Government. The draft roadmap was acknowledged by the attendees for further consideration.

### 3. Continuous Support by JICA

The Lao side requested the Japanese side to support the DEM to enhance the capacity of the PDEM by continuing the provincial seminars developed during the Project. JICA acknowledged the necessity of extending the capacity development aiming at the PDEM. At the same time, JICA expressed a concern on possible duplication of on-going seminar-type activities for capacity development of the PDEM funded by the World Bank. It was suggested that these seminars with similar purposes should be reviewed and clarify the demarcation to improve effectiveness of scarce resources.

### 4. Watershed Management

The Lao side pointed out necessity of watershed management in place in the Lao PDR. JICA explained that the World Bank and ADB were carrying out a pilot project on river basing management by setting up regular coordination meeting by stakeholders such as hydropower and irrigation. JICA explained that the World Bank (IFC) is currently undertaking an activity for revising the River Law. It also emphasized that the importance of clarifying the roles in watershed management between the MEM and the Ministry of Natural Resources and Environment.

### 5. Workshop to Present IPSM Project Activity

The Lao side proposed that a workshop presenting achievement of the IPSM activities should be held in Vientiane Capital by inviting EDL and the PDEM by the end of the Project. The experts agreed to hold such workshop and both parties agreed that the further details of the workshop should be discussed.

Annex-1: Presentation of 3<sup>rd</sup> JCC (Handout)

Annex-2: Attendance Lists



**3<sup>rd</sup> JCC on the Project for Improvement of the Power Sector Management (IPSM) in Lao PDR**

December 4, 2012  
Vientiane Capital, Lao PDR

## Contents

- 1. Explanation on regulatory specification**
- 2. Summary of progress**
  - (1) Target level during the IPSM project
  - (2) Summary of progress
- 3. Future activities and draft roadmap**
  - (1) Role of DEM in the context of LEPTS
  - (2) Determination of consensus standards
  - (3) Capacity development of PDEMs
  - (4) Schedule outline
- 4. Next activities during the IPSM project**

## 1. Explanation on regulatory specifications

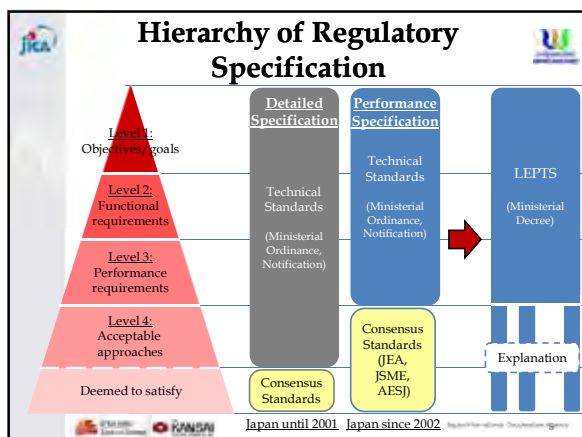
## Contents to be specified in regulatory standards

**Level 1: Objectives/goals** *Performance Specification*  
are what the regulation is to achieve.  
(e.g., public safety, stable and reliable power supply etc.)

**Level 2: Functional requirements**  
are what define the functions required to achieve objectives/goals.

**Level 3: Performance requirements**  
are the specified requirements to achieve the objectives for each functional requirements which determine quantitative criteria and levels to be satisfied.

**Level 4: Acceptable approaches**  
are specific methods or technical measures in order to demonstrate and verify the conformity with performance requirements, or satisfy performance requirements. *Detailed Specification*



### Examples of Detailed Specification (concrete gravity dam)

Level 1 ⇒ (Common) **Article 1: Purpose of Technical Standards**

1. Power facilities shall not harm the human body and damage any object.
2. The power facilities shall be installed so as not to cause any electrical and magnetic interference that may affect other electrical facilities.
3. There shall be of no significant effect on power supply despite of the power facilities being broken down or damaged.
4. Installation of the power facilities shall not have an adverse effect on the surrounding environment.

Level 2 ⇒ Articles 9 to 16: 2-2 Fundamental Requirements  
(ex: Article 10: Dam Stability)

1. A concrete dam shall be stable against i) sliding, ii) overturning and iii) materials failure
2. A fill dam shall be stable against sliding.
3. Dams other than concrete or fill dams shall be stable against sliding, overturning, and materials failure, which are foreseeable.

*(contd.)*

**Examples of Detailed Specification**  
(concrete gravity dam)

Level 3 & 4: for Concrete dams

Article 20: Loads (items are identified, but quantitative values are not specified)  
Self-weight, hydrostatic pressure, hydrodynamic pressure, mud pressure, seismic forces and uplift shall be considered.

Article 24: Concrete Materials (other acceptable standards are not specified)  
Concrete materials shall be confirmed by the tests in a standard such as ISO, or they shall be materials as specified in a standard such as ISO.

Article 26: Stability of Concrete Gravity Dams (formula and criteria are specified)

1. Overturning ⇒ Center of resulting force (usual) middle-third, (eq/flood) middle-half
2. Sliding ⇒ Shear friction SF:  $n = (f \times n + \tau \times l) / H$  (usual)  $n \geq 3$ , (eq/flood)  $n \geq 2$
3. Material failure ⇒ Stress inside dam body
  - Compressive stress: (usual)  $\leq 1/3$ , (eq/flood)  $\leq 1/2$  of comp. strength
  - Tensile stress: (usual)  $\leq 1/40$  of comp. strength
4. Methodology: static analysis using seismic coeff. in principle.

**Examples of Performance Specification**  
(other civil facilities)

Articles 42- 49

An intake (headrace, surge tank, penstock, tailrace, gate, powerhouse building etc.) shall be stable with respect to self-weight, hydrostatic pressure, hydrodynamic pressure, mud pressure, seismic force, external water pressure and earth pressure (according to the facility).

↓

How to prove being stable is NOT defined.

**Example of electrical facilities**  
(Detailed Specification)

Article 70: Protection of Operators against Dangers of High-voltage and Medium-voltage Electrical Facilities in a Closed Electrical Operating Area

3. (1) Installation for prevention of contacting  
Where the height of live parts of electrical equipment is N+2,250 mm or less (the minimum height shall be 2,500 mm), appropriate measures listed below shall be taken.
  - a. Provision of installing protective fences or wall
  - b. Provision of signs to prohibit entry at the entrances/exits
  - c. Provision of a locking device or another appropriate device at the entrances/exits
- (2) The height of external fences or wall shall be 1,800 mm or higher.

**Example of electrical facilities**  
(Performance Specification)

Article 85: Mechanical Strength of Hydraulic Turbines and Generators

1. Mechanical strength of hydraulic turbines and generators to be installed in hydropower stations shall withstand the mechanical shock with the maximum speed in the rotating parts of the hydraulic turbine and the generator connected to the hydraulic turbine and with the maximum water pressure in the parts of the hydraulic turbine receiving the water pressure.

↓

How to prove is NOT defined.

**Benefit of performance specification and necessary processes**

- Detailed specification liable to delay in taking into account the latest technological findings  
⇒ Easy to come up with technology progress
- Strong local regulation can be deemed as a Non-tariff barrier.  
⇒ global trend of deregulation and unification of standards (ISO, ICE) according to free trade expansion (WTO/TBT)

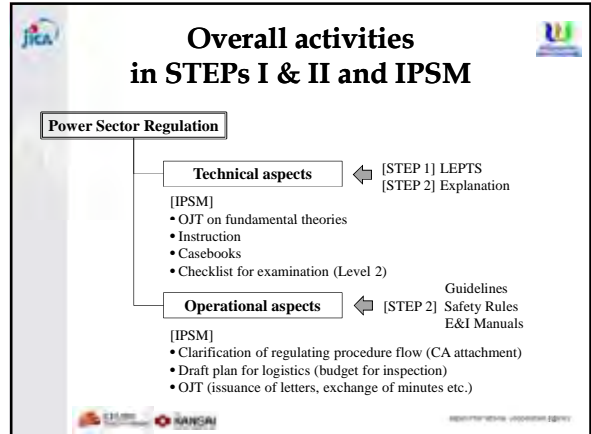
However,  
"rightness", "fairness" and "openness" are indispensable.

↓

- Utilization of "Consensus Standards" formulated by Academic Societies (ASTM, ASME etc.)
- Examination in open committees with industrial, governmental, and academic representatives

**2. Summary of progress**

# (1) Target level during the IPSM project



## Applicable scope of LEPTS

- Should LEPTS (= Technical Standards) cover all the technical issues with regard to electric power business?
  - > (Before STEP I) To resolve various problems such as inability to effectively operate and manage power facilities without a national technical standard.
  - > (IPSM-PDM) F/S should be examined in compliance with LEPTS
  - > (IPSM ?) Ensure the soundness of IPP facilities to be transferred after concession periods

etc.

- ## Objectives of existing LEPTS
- Objectives (Article 1)
    - Power facilities shall not harm the human body and damage any object.
    - The power facilities shall be installed so as not to cause any electrical and magnetic interference that may affect other electrical facilities.
    - There shall be of no significant effect on power supply despite of the power facilities being broken down or damaged.
    - Installation of the power facilities shall not have an adverse effect on the surrounding environment.
  - Scope (Article 2): in course of design, under construction and in operation
    - To achieve other purposes than above, other regulations or revision of LEPTS will be required.

## Difficulties in examination in conformity to LEPTS

- Tolerance for alternatives (Hydro Civil and Electrical)** [Article 3]
 

The technical contents contained in Section 2-3 to Section 2-7 (civil) and Section 3-3 to Section 3-7 (electrical) may not cover all the technical contents that should satisfy the fundamental requirements set forth in Section 2-2 and Section 3-2, and if proposed alternative should have sufficient technical basis to fulfill the fundamental requirements, such alternative shall be judged to conform to the fundamental requirements.
- Performance Specifications**

“Acceptable approaches” are NOT indicated for some items. ⇒ Developers shall demonstrate that their own specific approaches meet the performance requirements stipulated in LEPTS, and regulator should examine with “rightness”, “fairness” and “openness”.

## Target levels for examination

Level of examination	Contents	Technical phase	Target
Level 1: Examination on formality	- To verify whether all the required forms, documents and drawings are provided.	-- (Operational)	During IPSM
Level 2: Preliminary examination	- To evaluate the design criteria of all the items. - To conduct examination on the items with acceptable approaches in LEPTS.	Elementary	
Level 3: Technical examination on critical items	- Besides Level 2, to conduct examination on critical items without acceptable approaches (verification of the validity of methods and results).	Fundamental	Minimal Goal
Level 4: Technical examination on all items	- To conduct examination on all the items stipulated in LEPTS. - To replicate the calculation on the most critical items.	Sufficient	Ultimate Goal

## (2) Summary of progress

### Achievement of examination and inspection on actual IPP projects

#### Projects in Operation

Project	Field	Design stage			Construction stage			Operation stage				
		PDA	Chief Engr. (ECC)	B/D (ECC)	CA	Chief Engr.	Dam foundation	First impounding	ECO/ICO	COD	Chief Engr.	Reporting
1 Theun Hinboun	Civil Elec.				Oct-94					Mar-98	✓/✓	✓/✓
2 Houay Ho	Civil Elec.				Sep-93					Sep-99		
3 Nam Theun 2	Civil Elec.				Oct-02					Mar-10		
4 Nam Lik 1/2	Civil Elec.	May-06			Oct-06					May-10		
5 Nam Ngum 2	Civil Elec.	Jan-91			Mar-06					2013 (2011)		
# Nam Nhone	Civil Elec.	NR			NR					✓/✓ 2011		



### Projects under construction

Project	Field	Design stage			Construction stage				
		PDA	Chief Engr. (ECC)	B/D (ECC)	CA	Chief Engr.	Dam foundation	First impounding	ECO/ICO
1 Hongsa	Civil Elec.	Dec-06			Nov-09	✓/✓	✓/✓		
2 Nam Ngum 5	Civil Elec.				Apr-07	✓/✓	✓/✓	✓/✓	
3 Nam Ngiep 2	Civil Elec.	Aug-10			Aug-11				
4 Theun Hinboun expansion	Civil Elec.	NR			Aug-08	✓/✓	✓/✓	✓/✓	
5 Xekaman 3	Civil Elec.	NR			Jan-06				✓
6 Xekaman 1	Civil Elec.	Mar-08			Feb-11		✓/✓		
7 Nam Ou 2, 5, 6	Civil Elec.	Oct-07			Jun-12				
8 Xepian-Xenamnoy	Civil Elec.	Nov-08			Oct-12				
9 Xayaburi	Civil Elec.	Nov-08			Oct-10				






- ### Summary of achievement and recommendation
- Examination for Basic Design (ECC) is underway for one IPP project (Nam Ngiep 1)
  - Inspection of dam foundation conducted for four projects
  - Inspection prior to first impounding conducted for two projects
  - Inspection before commercial operation conducted for two projects
- [Recommendation]**
- Application of "Chief Engineers" should be submitted from all the IPP developers in operation, under construction and under CA negotiation (basic design stage).

- ### Challenges of the future
- Certification without covering all the technical issues (Level 2 exam. ⇒ Level 3 & 4 exam.)
  - Examination and inspection mandatory for PDEM
  - Examination and inspection for EDL's facilities
- ↓
- Compilation of "Roadmap for future power regulation"**

- ### 3. Future activities and draft roadmap
- (1) Roles of DEM in the context of LEPTS
  - (2) Determination of consensus standards
  - (3) Capacity development of PDEMs
  - (4) Schedule outline






## (1) Roles of DEM in the context of LEPTS

## Expected roles of DEM in power regulation

**< Order of priority in the future >**

1. **Develop and manage regulations as necessary**
2. **Technical instructions for PDEMs**  
⇒ continuous technical support from JICA
3. **Conduct examination (of design), inspection (of construction works) and monitoring (of operation) in conformity to regulations**  
⇒ can be fully (routine work) or partly (highly professional work) outsourced

## Future Scenarios for Examination and Inspection

On condition that LEPTS is applied for examination and inspection (E&I), the following three scenario will be acceptable:

**Scenario 1: Authentic scenario**

- DEM/PDEM conducts E&I strictly according to the electricity law and LEPTS.




**Scenario 2: External consultants scenario**

- Registered external consultants can partly or fully conduct E&I entrusted by DEM/PDEM.

**Scenario 3: EDL supporting scenario**

- EDL projects: EDL's self E&I is deemed as E&I of the Government.
- IPP projects: EDL can partly or fully conduct E&I on behalf of DEM/PDEM.
- MEM/PDEM: EDL can conduct E&I as the undertaker of facilities.



In the Scenario 2 & 3, DEM/PDEM shall audit the E & I conducted by consultants/EDL.








## (2) Determination of consensus standards










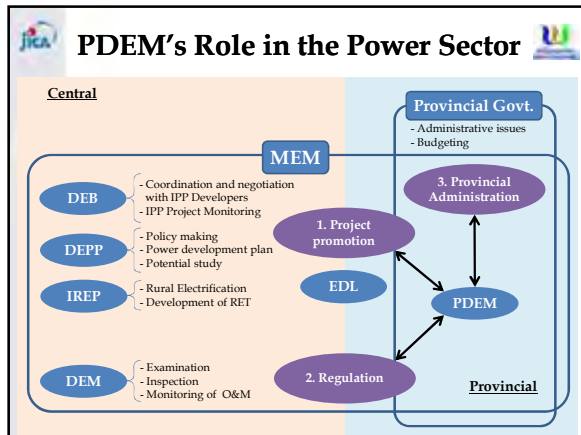
## (draft) Determination of "Consensus Standards"

- Explanation should be updated to consensus standards (technical guidelines)
  - Selection of applicable standards
    - ISO, IEC, ASME, ASTM etc., but should be definitive.
    - Generally, how to formulate should be focused (to ensure rightness, fairness and openness).
  - Disclose to public including developers
    - Public comments will be welcome.
  - Authorization by the Government
    - Government's endorsement will be required on behalf of academic societies.
  - Periodical maintenance
    - e.g., every five years according to actual experiences in examination and inspection.

## (3) Capacity development of PDEMs



## Major job description of PDEM

**Provincial administration:**

- (1) Request and execution of budget and report to the Governor.

**Promotion of electrification projects:**

- (1) Planning, getting approval, ordering, supervision and monitoring of grid extension.
- (2) Planning and supporting (assistance to developers) of small hydropower projects (< 15MW).

**Regulation for electrification projects:**

- (1) Implementing examination and inspection (E&I) for distribution and small hydropower projects.
- (2) Issuing certificates to developer (from the Governor).

## Actual situation of PDEM

- Capacity of PDEM**
  - 8 to 10 personnel for energy sector per PDEM
  - 4 distinguishable roles corresponding to the central government (DEB, DEPP, DEM and IREP)
- Examination and inspection**
  - Examination and inspection for contractors (Chief engineers are appointed from the contractors)
  - ⇒ Self E&I (not compliance with LEPTS)
  - Support from EDL (due to technical constraint)
- Amount of target projects**
  - Too much for PDEM, distribution projects in particular
  - Small hydro projects (< 15 MW) are increasing after the amendment of Electricity Law

## Necessary activities (short term)

- 1. Clarification of PDEM's role**
  - Clarification of realistic roles among DEM, PDEM and EDL considering the amount of projects and PDEM's capability
- 2. Technical support from DEM and EDL**
  - Technical support for E & I implementation, specifically in the field of small hydropower projects
  - Logistic support (human resources, equipment etc.) for examination and inspection in the field of distribution
  - Provision of training on primitive technical knowledge and LEPTS operation in EDL-TC to PDEM

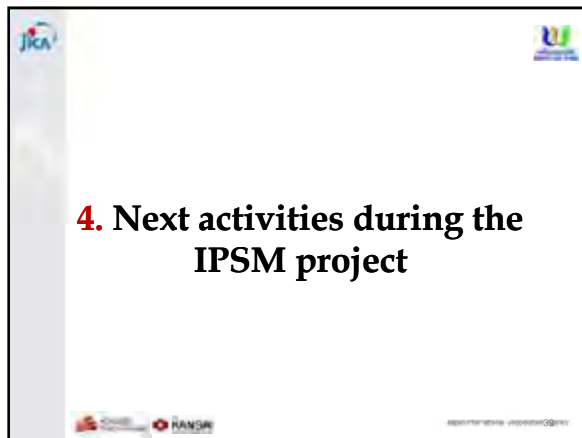
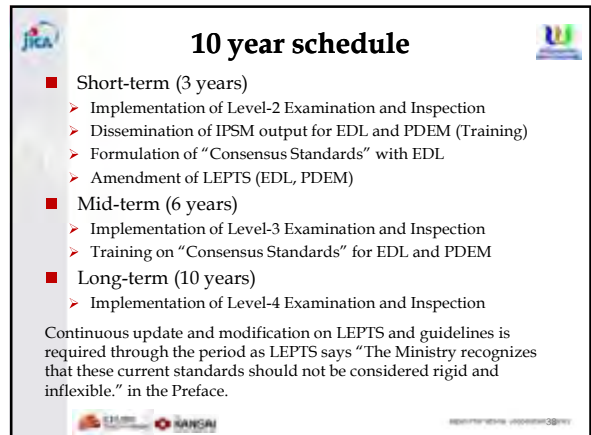
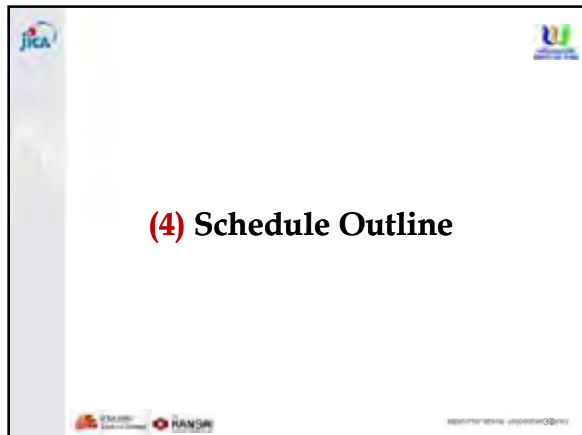
## Necessary activities (mid-long term)

- 1. Amendment of Law and Regulation**
  - Clarification of responsibilities among DEM, PDEM and EDL
  - Authorization to EDL: Regulatee ⇒ Regulator
- 2. Comprehensive support from EDL**
  - Unification of EDL standards and LEPTS
  - Logistic support (human resources, equipment etc.) for examination and inspection
  - Provision of training on LEPTS in EDL-TC

## (Proposed) Necessary Training and Seminar for PDEM

- **Small hydropower:**
  - (1) Understanding of small hydropower development procedures and roles of PDEM
  - (2) Understanding of basic technical knowledge on small hydropower
  - (3) Understanding of the procedure on E & I
- **LEPTS understanding seminar**
  - (1) Understanding of LEPTS and its procedure





**List of Participants for the 3rd JCC of the Technical Cooperation Project  
for the Improvement of Power Sector Management  
December 4, 2012 at DEM, Vientiane**

<b>No.</b>	<b>Name</b>	<b>Position</b>	<b>Organization</b>
1	Khammany INTHIRATH	Vice Minister (MEM)	MEM
2	Sisoukan SAYYALATH	Director General	DEM / MEM
3	Bouatheap MALAYKHAM	Deputy Director General	DEM / MEM
4	Bounsy DETHTHAVONG	Deputy Director General	DEM / MEM
5	Houmphanh VONGPHACHAN	Director / Power Export Projects Management Division	DEM / MEM
6	Phoukhong SENGVILAY	Power Export Projects Management Division	DEM / MEM
7	Phouxay VIENGVIKAY	Power Export Projects Management Division	DEM / MEM
8	Va YATHORTOU	Power Export Projects Management Division	DEM / MEM
9	Vannaphone VANNOUVONG	Power Export Projects Management Division	DEM / MEM
10	Thammanoune NAKHAVITH	Director / Energy Enterprises Management Division	DEM / MEM
11	Oudomsine KHAMISISOPHA	Energy Enterprises Management Division	DEM / MEM
12	Lair PHIMPHISANE	State-Owned Enterprises Management Division	DEM / MEM
13	Sonepjuang LAWBOUNHOM	State-Owned Enterprises Management Division	DEM / MEM
14	Bounpasong PAIMMAVONSA	Official	ID / MEM
15	Thongkhanh PHIMVILAY	Deputy Director	PD / MEM
16	Khamsing PHOSALATH	Technical Depart Director	EdL
17	Masato TOGAWA	Chief Representative	JICA
18	Susumu YUZURIO	Senior Representative	JICA
19	Nobuo HASHIMOTO	JICA Expert	JICA
20	Kayasith SADETTAN	JICA staff	JICA
21	Hirokazu NAKANISHI	Chief Advisor	JICA Expert for IPSM
22	Yasuhiro KAWAKAMI	Deputy Chief Advisor	JICA Expert for IPSM
23	Masato ONOZAWA	Development of Training	JICA Expert for IPSM
24	Koji ODA	Assistant Hydropower Civil Engineering	JICA Expert for IPSM






Lists of Participants for the 3rd JCC on the technical cooperation  
on the project for Improvement of Power Sector Management in Lao PDR  
December 4, 2012 at DEM, Vientiane

No.	Name	Position	Organization	Telephone	Signature
1	ZINTHIRATH KHAMMANY	Vice Minister	MEM	55551155	
2	Sisouk SAYSARATH	Director General	DEM	55501533	
3	Bouathep Malayphon	J.D.G	DEM	22217917	
4	Bandy Dethong	DDG	DEM	99819839	
5	Deumpasong PHIMMANONGSA	Official	IDP	22235536	
6	MR Thongreuaeh Phomsila	Deputy Director	PD	99779607	
7	MR.oudomsine KHANSISOPH	Engineer	DEM	55413583	
8	MR. VA YATHOITON			55799774	
9	Thammavongse NAKHAVIT	Acting Director of Division	EEM Division	55624375	
10	Houm Phann-Vongphachon	Director of DIV.	DEM	55659124	
11	Phoukchong SENGALAY	Deputy of Division	DEM	99401978	
12	Khaousing Vongsavath	Technical Report Director	EDL	55530849	
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Lists of Participants for the 3rd JCC on the technical cooperation  
on the project for Improvement of Power Sector Management in Lao PDR  
December 4, 2012 at DEM, Vientiane

No.	Name	Position	Organization	Telephone	Signature
1	Mr. Kouyouth	PO	JICA Laos office	241100	
2	Mr. Phouxay U.	Engineer	DEM	22228235	
3	Mr. Some Phuang	Engineering	DEM	23845674	
4	Mr. Lait	Engineer	DEM	23229900	
5	Mr. Vannaphone Vannouvang	Engineer	DEM	96421199	
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Lists of Participants for the 3rd JCC on the technical cooperation  
on the project for Improvement of Power Sector Management in Lao PDR  
December 4, 2012 at DEM, Vientiane

No.	Name	Position	Organization	Telephone	Signature
1	Dr. Masao Togawa	Chief Rep	JICA Laos	-	
2	Susumu Yuzuru	Sen. Rep	"	-	
3	Nobuo HASHIMOTO	JICA Expert	JICA	-	
4	MASATO DIDZAKAWA	JICA Expert	Private	-	
5	Yasuhiko KAWAKAMI	JICA Expert	CEPCO	-	川上 康博
6	Nakanishi	Chief Advisor	- " -	5889-3800	中野 正
7	Koji ODA	JICA Expert	CEPCO	-	
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(4) 第 4 回 JCC

MINUTES OF MEETING  
FOR  
THE FOURTH JOINT COORDINATING COMMITTEE  
OF  
THE JAPANESE TECHNICAL COOPERATION PROJECT  
FOR  
THE IMPROVEMENT OF POWER SECTOR MANAGEMENT (IPSM)  
IN  
THE LAO PEOPLE'S DEMOCRATIC REPUBLIC

The Fourth and the last Joint Coordinating Committee of the Japanese Technical Cooperation Project for the Improvement of Power Sector Management (IPSM) in the Lao PDR (hereinafter referred to as "Project") was convened on March 11, 2013 at the meeting room of the Department of Energy Management (hereinafter referred to as "DEM"), Ministry of Energy and Mines (hereinafter referred to as "MEM") of the Lao PDR.

The Japanese side and the Lao side discussed issues related to the Project and exchanged views with other stakeholders that attended the meeting. Both sides further discussed future activities with regard to power sector regulation.

As a result of the discussion, the Lao and the Japanese sides agreed upon the matters referred to in the document attached hereto.

Vientiane Capital, March 13, 2013

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Mr. Hirokazu NAKANISHI  
Chief Advisor  
JICA IPSM Project

---

Mr. Khammany INTHIRATH  
Vice Minister  
Ministry of Energy and Mines  
Lao PDR

## ATTACHMENT

### 1. Recognition of achievement on IPSM

The Japanese side presented the achievement of the Project along with the major outputs in the STEP 1 and STEP 2 projects as shown in ANNEX-1. The attendees acknowledged the overall achievement of the Project and current status related to power sector regulation.

### 2. Recommendations to future activities for power sector management

The Japanese side also presented recommendations for power sector management as shown in ANNEX-1, which included dissemination for developers and contractors, focusing on the most critical issues, and review and revising the LEPTS and the Guideline. Such recommendations were acknowledged by the attendees for further activities.

### 3. Interim evaluation of JICA Evaluation Team

The JICA Evaluation Team raised a question about why some indicators of the project purpose in the project design matrix (PDM) with regard to PDEM and EDL have not been achieved. The Lao side explained the actual situation of PDEM and EDL, including the technical and personnel capacity of PDEM and procurement procedures of EDL.

### 4. Continuous support from JICA

The Lao side requested the Japanese side to deliver continuous support for the DEM to enhance the capacity of the MEM and PDEM, and revise the LEPTS, the Guidelines and the relevant documents. JICA acknowledged the necessity of cooperation for development aiming at DEM/PDEM. At the same time, JICA proposed that further discussion should be required before the formulation of future projects.

Annex-1: Presentation of 4<sup>th</sup> JCC (Handout)

Annex-2: Attendance Lists

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





## 4<sup>th</sup> JCC on the Project for Improvement of the Power Sector Management (IPSM) in Lao PDR



March 11, 2013  
 Vientiane Capital, Lao PDR



## Contents



1. Review on overall LEPTS activities
2. Achievement of IPSM project
3. Recommendations




## 1. Review on overall LEPTS activities



### STEP 1 (May 2000 - Feb.2003) (Electric Power Technical Standard Establishment)



- Background (*excerpts from "Joint Evaluation Report"*)
 

"The most of existing power plants, the power transmission and the transformation facilities are designed and constructed by foreign capitals. Accordingly, different power technology standards have been applied to each power plant. The differences of the design standards create the differences in insulation performance of each power plant. The differences of insulation performance make effective countermeasure operation impossible."

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Necessity of a "national technical standard"





### Outputs of STEP 1



Narrative summary	Results
<b>[Project Purpose]</b> DOE will be able to establish and maintain LEPTS.	✓ LEPTS had been outputted.
<b>[Outputs]</b> 1 Necessary information for LEPTS will be collected.	✓ The Japanese experts and C/I's could not find all the necessary information, which was estimated to fit into Lao situation in referring the standards of Japan, IEC, USSR, USACE, COLE, China, Canada, IEEE, etc.
2 Necessary technique for establishing/maintaining LEPTS was grasped.	✓ C/I's obtained sufficient knowledge to establish and maintain LEPTS.
3 Necessary contents of LEPTS were grasped.	✓ LEPTS covers the comprehensive field, such as hydropower civil engineering, hydropower plant/substation, transmission, and distribution with the 184 articles.
4 LEPTS started to be disseminated.	✓ Rural workshops were held in north and south.

### Recommendations in STEP 1

- Regulations and guidelines of LEPTS should be established. ⇒ STEP 2
- DOE and EDL should maintain and elaborate trainers training courses and seminars on LEPTS for the officers and engineers in provincial areas. ⇒ STEP 2 & IPSM
- DOE and EDL should organize the group which establishes, maintain, and disseminate LEPTS.
- DOE should watch and take necessary measures if necessary for the smooth progress of the official procedure for the enactment of LEPTS.
- DOE and EDL should collect statistical data and information of accidents and troubles to improve the standard.
- DOE and EDL should effectively utilize equipment books, and standards provided in the project.

2

**STEP 2 (Jan.2005 - Jan.2008)**  
(Lao Electric Power Technical Standard Promotion)

**Background**

After the enactment of LEPTS, STEP 2 was implemented as the second step of STEP to strengthen overall capacity of electric power sector in Laos to administer and enforce LEPTS. STEP 2 also aims at developing capacity to train officers and engineers who is competent in six technical areas of electric power.

**CSDEP** **KANSU**

**Outputs of STEP 2 (1)**

Narrative summary	Results for evaluation
<b>Project Purpose</b> LEPTS is enforced within public and private sectors	<ul style="list-style-type: none"> <li>STEP 2 conducted E&amp;I, giving comments to owners or investors of construction and installation of power facility: (1) Examination (Xeset 2, Nam Ngiep 1, Xekaman 3, Xekaman 1, Xelamong 2, Xekaman, Tad Salen, THAP, Nam Ou, Nam Lik, JBIC TL &amp; SS (Paksan - Pakse), ADI NARPD TL &amp; SS, Luang Prabang Univ. D. &amp; US); (2) Inspection (Nam Theun 2)</li> <li>Power facility database except user's site covering whole country had been prepared and effective</li> <li>Procedures and format for accident report were relate in the Guidelines in May 2007, but accident report had not yet been submitted.</li> </ul>
<b>Outputs</b> 1. Complementary guideline and manuals relating to LEPTS is drawn	<ul style="list-style-type: none"> <li>Development of Guidelines and Safety Rules was completed</li> <li>All workshops were completed as planned.</li> <li>Translation Committee with eight members carried out final review and translation work.</li> </ul>

**CSDEP** **KANSU**

**Outputs of STEP 2 (2)**

Narrative summary	Results for evaluation
2- Through OJT, knowledge and training skills of C/Ps of DOE and EDL as trainers were upgraded	<ul style="list-style-type: none"> <li>OJT related to 6 technical fields was implemented at EDL construction sites</li> <li>7 training courses at EDL TC were implemented as planned</li> <li>23 trainees passed examination and were awarded certification</li> </ul>
3-1 DOE staff obtained necessary knowledge and skills as inspectors and transfer the knowledge and skills to PDEM staff.	<ul style="list-style-type: none"> <li>Training curriculum was prepared by July 2007.</li> <li>Materials for training at 60 units of offices were prepared.</li> <li>Training program was carried out from September through November 2007.</li> </ul>
3-2 EDL engineers obtained necessary knowledge and skills as in order to apply the LEPTS to their works.	<ul style="list-style-type: none"> <li>Training curriculum was ready in June 2007.</li> <li>Materials for training at EDL training centre was prepared by July 2007.</li> <li>Training program was implemented between July and December 2007.</li> </ul>

**CSDEP** **KANSU**

**Outputs of STEP 2 (3)**

Narrative summary	Results for evaluation
4 Management structure for the LEPTS was formulated.	<ul style="list-style-type: none"> <li>A proposal for establishing the Regulatory Unit of DOE was submitted to MEM for approval in Dec. 2006</li> <li>DOE determined that the unit would be established by the end of June 2007.</li> <li>Guidelines and Safety Rules were approved in May 2007.</li> </ul>
5 Awareness of LEPTS of public and private sectors was increased	<ul style="list-style-type: none"> <li>Brochures and leaflets was produced by Aug. 2007.</li> <li>20 sets of LEPTS were sold to public. Guidelines and Safety Rules in Lan language were published by Sep. 2007.</li> </ul>

**CSDEP** **KANSU**

**Recommendations in STEP 2**

(To DOE and EDL)

- Enforcing EDL and other operators to submit accident report.
- Dissemination of LEPTS to whole country

(To DOE)

- Establishment of Regulatory Division in DOE

(To EDL)

- Enforcing LEPTS to EDL projects

(To JICA)

- Reviewing F/S reports of IPPs by Short-term experts.
- Extension of Project for supporting examination of D/D of JBIC T/L & S/S project.

**CSDEP** **KANSU**

**IPSM (STEP 3) (Oct.2010 - Mar.2013)**  
(Improvement of Power Sector Management)

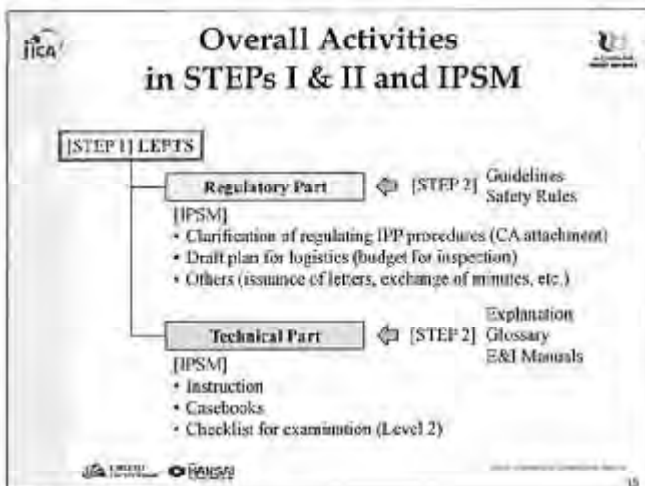
**Background**

Despite the efforts and achievements through STEP 1 and STEP 2, power sector administration on the national level was in the process of capacity development and not fully able to act as a powerful engine pulling the provincial authorities forward. The task of maintaining and further developing the power infrastructure to be installed in a sustained manner required an improvement of power sector administration and the capacity for project management on both national and provincial levels.

**CSDEP** **KANSU**

Outputs of IPSM (1)	
Narrative summary	Results
<b>[Project Purpose]</b>	
Regulatory function of the electric power sector is strengthened.	<ul style="list-style-type: none"> <li>One examination of B/D document was conducted by DEM.</li> <li>12 inspections were conducted by DEM.</li> <li>DEM conducted no examination and inspection during the project period due to its technical capability.</li> <li>EDL conducted no inspection pursuant to LEPTS during the project.</li> <li>EDL submitted no report to MEM.</li> </ul>
<b>[Outputs]</b>	
1. DoE's examination and inspection capacities are enhanced.	<ul style="list-style-type: none"> <li>Instructions for examination and inspection was formulated by July 2011.</li> <li>One examination and 12 inspections were conducted based on the procedures stipulated in LEPTS and the Guidelines.</li> <li>DEM has been established since Feb. 2012, dedicated to energy sector management including regulation.</li> </ul>

Outputs of IPSM (2)	
Narrative summary	Results
<b>[Outputs]</b>	
2. The capacity of DoE for supervising PDEM is enhanced.	<ul style="list-style-type: none"> <li>Most of the approved LEPTS trainers have already transferred and been engaged in different jobs, so that DEM staff were trained as trainers instead.</li> <li>Practical examinations and inspection instructions were formulated and translated into Laotian Language by C/Ps.</li> <li>PDEMs have never conducted inspections due to their capacity constraint.</li> <li>Casebooks were continuously updated taking into account actual nonconforming cases found in inspections.</li> </ul>
3. Understanding on LEPTS in target provinces is improved.	<ul style="list-style-type: none"> <li>LEPTS understanding seminars were held in three target provinces (Champasak, Xiangkhouang and Savannakhet).</li> <li>Questionnaires after the seminars identified that participants' understanding on LEPTS was improved.</li> <li>Casebooks were translated into Laotian Language by C/Ps.</li> <li>Casebooks were continuously updated taking into account actual nonconforming cases found in inspections.</li> </ul>



**2. Achievement of IPSM project**

Activities for Output 1 (1)	
Narrative summary	Results
<b>[Output 1] DoE's examination and inspection capacities are enhanced.</b>	
1-1. Review and analyze issues and problems of the present examination and inspection process with assistance of Japanese experts.	<ul style="list-style-type: none"> <li>In STEP 2, 13 examinations and inspections were conducted.</li> <li>As a result of survey by IPSM, there were no record of examination and inspection, and DoE had never issued the result of examination and inspection.</li> </ul>
1-2. Conduct sample examination of documents (F/S, D/D, etc.) and on-site inspection with assistance of Japanese experts.	<ul style="list-style-type: none"> <li>One examination (B/D document) was conducted based on the procedures stipulated in LEPTS and the Guidelines.</li> <li>12 inspections were conducted based on the procedures stipulated in LEPTS and Guidelines.</li> </ul>
1-3. List up points to be noted in the process of examination and inspection (including how to instruct enterprises who submitted documents) and formulate the practical examination and inspection instructions with assistance of Japanese experts.	<ul style="list-style-type: none"> <li>Instructions for examination and inspection were formulated in July 2011.</li> <li>Case books for examination and inspection were formulated in July 2011.</li> <li>Roles of relevant agencies were clarified and regulatory flow diagram was optimized.</li> </ul>

Activities for Output 1 (2)	
Narrative summary	Results
<b>[Output 1] DoE's examination and inspection capacities are enhanced.</b>	
1-4. Revise the examination and inspection instructions properly.	<ul style="list-style-type: none"> <li>Instructions for examination and inspection were revised until July 2012.</li> </ul>
1-5. Formulate a plan of institutional arrangements for enhancing regulatory function of DoE.	<ul style="list-style-type: none"> <li>DEM has been established since Feb. 2012, dedicated to energy sector management including regulation.</li> </ul>

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### Activities for Output 2

Number/Description	Results
<b>(Output 2) The capacity of DoE for supervising PDEM is enhanced.</b>	
2-1 List up points to be noted in the process of inspection and formulate the practical inspection instructions (including how to instruct enterprise) with assistance of Japanese experts.	✓ Practical examination and inspection instructions were formulated and translated into Laoian Language by C/Ps.
2-2 PDEM conducts on-site inspection with assistance of LEPTS trainers.	✓ PDEMs have never conducted inspections due to their capacity constraint.
2-3 DoE formulates case books based on actual cases with assistance of Japanese experts.	✓ Case books for examination and inspection were formulated and translated into Lotion Language by C/Ps.
2-4 Review the case books continuously.	✓ Casebooks were continuously updated taking into account actual nonconforming cases found in inspections.
2-5 Revise the inspection recording form for PDEM.	✓ As a result of survey by IFSM, PDEMs have no inspection recording forms.

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### Activities for Output 3

Number/Description	Results
<b>(Output 3) Understanding on LEPTS in target provinces is improved.</b>	
3-1 Review and analyze issues and problems of the implementation of LEPTS by using actual cases with assistance of Japanese experts.	✓ PDEMs had never conducted inspection before the project, so that DEM could not review and analyze PDEM's issues and problems.
3-2 Formulate case books on how to implement LEPTS at provincial level with assistance of Japanese experts.	✓ Casebooks were translated into Lactian Language by C/Ps. ✓ Casebooks were continuously updated (taking into account actual nonconforming cases found in inspections).
3-3 LEPTS trainers conduct seminars on LEPTS in target provinces with assistance of Japanese experts.	✓ LEPTS understanding seminars were held in three target provinces.

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### Competency analysis

Objectives	Descriptive/ Training Needs (Example)
1. Establishing Technical Capacity	Setting up design concepts ✓ To ensure wide range of understanding on laws and regulations regarding LEPTS ✓ To provide prospective IPP investors adequate guidance and information on design concepts in all technical fields (i.e. CE, HE, SE, TL and SS) to comply with LEPTS
	Calculating facility ✓ To review the compliance with LEPTS to ensure public safety ✓ To check the conformity with LEPTS to ensure stable supply of electricity (Knowledge and skills in calculating all facilities etc.)
	Implementing inspections and examinations ✓ To undertake examination and inspection on-site using manuals and checklist ✓ To prepare comments and directions attached to the letter of approval submitted to the developer based on the results of inspections and examinations.
2. Promote, plan and develop the basic policies related to LEPTS	Planning of inspection
3. Teaching and training	Teaching and training
4. Revising manuals	Revising manuals

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### Strengthening inspection capacity

■ Implementation of OJT along with development of instructions and casebooks

No.	Date	Project & stage	HC	HF	DF	RF	AC
1	Feb. 7 - 8, 2011	Paksan / Pakkay T/L (under construction)				✓	
2	Feb. 21 - 23, 2011	Tham - Hsinban HPP Exp. (under construction)	✓	✓	✓	✓	
3	Feb. 17, 2011	D/L facilities in Vientiane Province					✓
4	May 16 - 21, 2011	Nam Ngum 2 HPP (existing)	✓	✓			
5	May 20 - 26, 2011	Phonthong, Vang Vieng D/L (existing and COD)					✓
6	Jul. 14, 2011	Nam Ngum 1 HPP (existing)		✓			
7	Aug. 18 - 19, 2011	Nam Ngum 1 HPP, Nakaython S/S (existing)	✓			✓	✓
8	Feb. 28, 2012	Shifting DL facilities due to road expansion in Dornmakhoum Village, Vientiane Capital					✓
9	Feb. 29, 2012	Thantong Substation					✓
10	May 31, 2012	Nam Mang 2 Hydropower station (existing)	✓	✓	✓	✓	
11	Jul. 2 - 3, 2012	D/L facilities in Vientiane Province					✓

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### Strengthening examination capacity

■ Setting examination levels based on technical difficulties

Level of examination	Contents	Technical phase	Target
Level 1: Examination on formality	To verify whether all the required forms, documents and drawings are provided.	(Operational)	During IFSM
Level 2: Preliminary examination	To evaluate the design criteria of all the items. To conduct examination on the items with acceptable approaches in LEPTS.	Elementary	
Level 3: Technical examination on critical items	Besides Level 2, to conduct examination on critical items without acceptable approaches (verification of the validity of methods and results).	Fundamental	Minimal Goal
Level 4: Technical examination on all items	To conduct examination on all the items stipulated in LEPTS. To replicate the calculation on the most critical items.	Sufficient	Ultimate Goal

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### Strengthening examination capacity

■ Result of Strengthening examination capacity

- ✓ Focusing on technical subjects with the highest priority
- ✓ Implementation of OJT by real application documents

Item	Objective	Results (as of March 2013)
(a)	Identification of the priority items in the technical applications and plans	<ul style="list-style-type: none"> <li>✓ Understand and check important points on examinations and inspections, and can insist if these items in the seminar to PDEM.</li> <li>✓ Develop original check list and has a positive attitude toward examinations and inspections.</li> </ul>
(b)	Analysis (calculation) of stability of dam	<ul style="list-style-type: none"> <li>✓ Understand the combination of external load factors, and methods for assessing dam stability.</li> <li>✓ Has a positive attitude to check the validity of the result of the calculation by himself.</li> </ul>
(c)	Planning (and design) of other structures (e.g. spillways, power house, etc.)	<ul style="list-style-type: none"> <li>✓ Understand the basic concept of the stability of other civil structures because it is almost the same as that of dam body.</li> <li>✓ Has a positive attitude to study the contents of LEPTS, Guideline, Explanation by himself.</li> </ul>
(d)	Design of Maximum Flood Discharge and Floodward	<ul style="list-style-type: none"> <li>✓ Develop the capacity by himself because the C/P has knowledge of hydrology from the beginning.</li> </ul>

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Observed changes (1)	
Field	Technical change
DD	At the initial phase of the project, C/Ps tended to insist on improvement of personal knowledge. They understood the check points based on the articles of LEPTS and guidelines. At on-site inspections, C/Ps are able to request the developer for submission of required documents.
	C/Ps understood the LEPTS procedures and its workflow. They can make and issue official documents (approval letter, etc) for notifying the developer the result of E&I. C/Ps can prepare a draft of M/M in advance in order to issue the M/M within the period of the site inspection.
IE	C/Ps understood important (check points of examination and inspection regarding human life (emergency) water intakes devices, necessary clearance in live parts, etc).
	C/Ps learned their work from experience C/Ps, and they have improved their attitude toward their work every time they experienced OIT.
	Regarding local seminar on the promotion of LEPTS understanding, C/Ps had a forward-looking attitude that they practiced presentation before the seminar. After the seminar, C/Ps had a forward-looking attitude that they had a wrap-up meeting for next seminar.

Observed changes (2)	
Field	Technical change
TI	C/Ps understood the purpose and necessity of the LEPTS and improved their own skills and knowledge. Regarding examination, C/Ps required submission of the document yet to submit and re-submission of uncompleted document.
	At the T/L site inspection C/Ps pointed out inadequacy of conductor clearance, etc. They can inspect/examine facilities by themselves with check sheet and instructions.
SS	For example, as a result of Expert's instruction of insulation design, C/Ps understood the purpose and necessity of such facilities. C/Ps' lecture of LEPTS and related regulating policy was easy to understand at the seminar as previous, so they got skills as an inspector/examiner.
	C/Ps understood the importance of conformity with LEPTS. They became active regarding instruction of LEPTS to OEM.
DI	C/Ps made technically accurate instruction to a contractor and requested them to revise the technical document. When IFSM was started, C/Ps' level of understanding on the procedures and examination dates was limited. Presently, they are able to explain these procedures properly.

### 3. Recommendations

- ### Constitution of LEPTS
- Regulatory procedural part (Articles 3 - 7)
    - Conformity to technical standards (Art.3/Art.14, 21, 22, 35)
    - Nomination of Chief Engineers (Art.4/Art.25)
    - Examination and Inspection (Art.5)
    - Order of remedy for conformance to technical standards (Art.6/Art.23)
    - Obligation for reporting (Art.7/Art.43)

⇒ Better be stipulated in Electricity Law all in one
  - Technical standards (Articles 1, 2 and 8 - 184)
    - General provisions (Art. 1 and 2)
    - Hydropower civil engineering (Art. 8 - 54)
    - General and common provisions on electrical facilities (Art. 55 - 73)
    - Hydropower electrical engineering (Art. 74 - 96)
    - Transmission lines (Art. 97 - 136)
    - Distribution lines (Art. 137 - 165)
    - User's sites electrical installation (Art. 166 - 184)

⇒ Can be replaced by consensus standards

Responsibilities of Regulator and Owner (1)		
	Owner (Developer)	Regulatory Authority (DEA/DEM)
<b>[Design Stage]</b>		
Chief Engineers	Notification	(Qualification)
Field Investigation Plan	Application	Approval
Design Criteria	Application	Examination (Approval/Remedy Order)
Detailed Design (before commencement of construction)	Application	Examination (Approval/Remedy Order)
<b>[Construction Stage]</b>		
Commencement of Construction	Notification	Reception
Construction Commencement Report	Submission	Reception
Chief Engineers	Notification	(Qualification)
Inspection of dam foundation	Application	Inspection (Approval/Remedy Order)
Flood management rules	Notification	Reception

Responsibilities of Regulator and Owner (2)		
	Owner (Developer)	Regulatory Authority (DEA/DEM)
<b>[Construction Stage]</b>		
Inspection prior to first impounding	Application	Inspection (Approval/Remedy Order)
Examination and inspection before commencement of commercial operation	Application	Examination and Inspection (Approval/Remedy Order)
<b>[Operation Stage]</b>		
Report for commencement of operation	Submission	Reception
Chief Engineers	Notification	(Qualification)
Safety Rules	Submission	Reception
Regular Report	Submission (annually/monthly)	Reception
Accident report	Submission (each case)	Reception

**Dissemination to Developers**

- Developers and contractors have no idea on LEPTS -

- Dissemination is insufficient
  - Government officials (DEB) in charge of PDA and CA negotiation ⇒ unawareness of IPP developers
  - EDL officers in charge of procurement ⇒ unawareness of EPC contractors and manufacturers

Developers and contractors are most critical players to install electric facilities conforming LEPTS, and proper regulation starts from developers' proactive cooperation such as notifications, applications, reporting etc. (regulation is essentially reactive)

↓

Too early legislation, especially regulatory part including Guidelines

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**Proper Role Demarcation between regulator and developer**

	Regulatory procedures	Technical Standards
Regulator (MEM/PDEM)	• Examination • Inspection HIGH	• Knowledge LOW
Developer (EDL, IPP, MEM/PDEM)	• Application • Reporting AUTHORITY	• Basic Design • Management EXPERTISE
Contractor, Manufacturer	• Supporting LOW	• Detail Design • Construction • Mfg & Installation HIGH

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**Sound Regulation in power sector**

- Regulation on Electric Power Facilities is not **Zero-Sum Game**, but **Cooperative Game**. (cf. Regulation on Pollution)

(Benefit of Developer)

- Quality facilities can bring long-life as-planned generation (maximum revenue and reduction of maintenance cost)

(Benefit of Contractor/Manufacturer)

- Standardized method of construction, materials, specification can bring cost reduction.

(Both Developer and Contractor)

- Alibi for errors and negligence in case of trouble/accident.

⇒ WIN-WIN situation will be possible.

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**Recommendations for sound and rational regulation**

- Dissemination for Developers and Contractors through concerned agencies
- Focus on the most critical issues (zero-sum items, important facilities etc.)
- Review and revise LEPTS and Guidelines
  - Conformity to International Standards (global trend, easy to understand for foreign developers/contractors, ASEAN/GMS Power Grid)
  - Unification of procurement specification and LEPTS, and delegation of authority to avoid duplicated examination and inspection

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**Current Examination and Inspection in Laos**

Type of E&I	Governing Standard	Examiner & Inspector	Examinee & Inspectee
Regulatory E&I	LEPTS	Regulator (DEM/PDEM)	Developer (EDL, IPP, DEM, PDEM)
Self E&I	LEPTi	Developer	Developer (Contractor)
Receiving E&I	Procurement specification	Developer	Contractor
Handover E&I	EDL's internal standard	EDL	PDEM IPP (in future)

In case governing standards for examination and inspection conform to LEPTS, receiving and handover E&I can replace regulatory E&I, and regulatory authority (DEM/PDEM) should audit the E&I records conducted by developer or EDL.

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*Thank you for your attention and continuous cooperation during the Project!*

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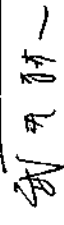
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**List of Participants for the 4th JCC of the Technical Cooperation Project  
for the Improvement of Power Sector Management  
March 11, 2013 at DEM, Vientiane**

No.	Name	Position	Organization
1	Khammany INTHIRATH	Vice Minister (MEM)	MEM
2	Chansavath BOUPHA	Director General	DOI/MEM
3	Bouathep MALAYKHAM	Deputy Director General	DEM/MEM
4	Bounsy DETHAVONG	Deputy Director General	DEM/MEM
5	Houmphanh VONGPHACHAN	Director / Power Export Projects Management Division	DEM/MEM
6	Phoukhong SENGVILAY	Power Export Projects Management Division	DEM/MEM
7	Phouxay VIENGVIXAY	Power Export Projects Management Division	DEM/MEM
8	Va YATHOTOU	Power Export Projects Management Division	DEM/MEM
9	Thammanoune NAKHAVITH	Director / Energy Enterprises Management Division	DEM/MEM
10	Viengsay CHANTHA	Acting Director / State-Owned Enterprises Management Division	DEM/MEM
11	Lair PHIMPHISANE	State-Owned Enterprises Management Division	DEM/MEM
12	Boungnavong CHANINAVISOUK	Acting Director / Division of Investment	Cabinet Office/MEM
13	Thongkhenh PHIMOILAY	Deputy Director	DOP/MEM
14	Boualom SAYSANAUONG	Deputy Director of REDD	IREP/MEM
15	Themphet CHANTHALOTH	Engineer	DEB/MEM
16	Chanthaphone PANYATHONG	Engineer	DEPP/MEM
17	Alivanh PHOMPHEEPHAK	Deputy Manager / Power Research	EDL
18	Vankham SENEMEUONG	Deputy Manager / EDL Training Center	EDL
19	Souriveth SONGVILAY	Planning	ECI
20	Koichi TAKEI	Chief Representative	JICA Laos Office
21	Susumu YUZURIO	Senior Representative	JICA Laos Office
22	Nobuo HASHIMOTO	JICA Expert to MEM	JICA Laos Office
23	Takayuki NIIMURA	JICA Expert to MEM	JICA Laos Office
24	Kunio NISHIMURA	JICA Evaluation Team (Evaluation Analysis)	ICONS
25	Hirokazu NAKANISHI	Chief Advisor	JICA Expert for IPSM
26	Hirokazu KINOSHITA	Hydropower Electric Engineering	JICA Expert for IPSM
27	Hiroaki FUJIWARA	Transmission Line	JICA Expert for IPSM

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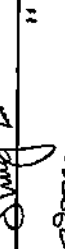


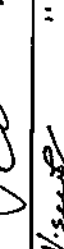

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on the project for Improvement of Power Sector Management in Lao PDR  
March 11, 2013 at DEM, Vientiane

No.	Name	Position	Organization	Telephone	Signature
1	KHAMMANY DANTHICRATH	Vice Director	MEM	55551155	
2	Koichi TAKEI	Chief Representative	JICA Laos Office	55517632	
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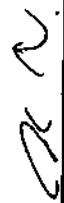

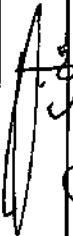




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No.	Name	Position	Organization	Telephone	Signature
1	N. Hashimoto	JICA Expert	JICA/MEM		
2	T. Niimura	JICA Expert	JICA/MEM		新村.
3	Thammanoune NAKHAVITHA	Acting Director of Division	MEM/DEM	55627375	
4	Souvruek SONGVILAY	Planning	ECI	55604443	
5	Thongchanh PHIMOLAY	DDG.	DOP	09779607	
6	Chansavath Boupha	DG	Dept of Inspection	99801889	
7	Bouathep Malaykham	DDG	DEM	22217917	
8	Bouasy Detraong	DDG	DEM	99819839	
9	Mr. Boungna vong CHANTAVANISOL	acting Division of investment	central office	22095914	
10	Mrs. Alivath Phom KheePhak	Dep. manager power sector.	EOL	77707078	
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March 11, 2013 at DEM, Vientiane

No.	Name	Position	Organization	Telephone	Signature
1	MR. HOUMPHAN V.	Director Division	DEM	55655184	
2	Mr. Viengkay CHANTHA	Acting Director of Division	DEM/MBM	55664393	
3	Mr. Vankham SPENBUDONG	D. manager BDI training center	BDI training center	22000255	
4	Mr. Boungnavorng CHANTHAVISODIC	acting division	cabinet office	220989114	
5	Mr. Phouxay V	Engineer	DEM	22228235	
6	Mr. Lair PHAMPISANE	Engineer	DEM	232279100	
7	Mr. VA YATHOTOU	Engineer	DEM	55797778	
8	Mr. Phoukham SENKILAK	Acting Division	DEM	22019778	
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No.	Name	Position	Organization	Telephone	Signature
1	Kunio NISHIMURA		ICONS		
2	Mr. Boualoum SAYSANAVONG	Deputy of REDD	IREP/MEH	99919221	
3	Mr. Thongsakhet CHANTHABHAKDI	Engineer	DEP/MEH	822 2 8268	
4	Mr. Chanthaboune PONGSATHONG	Engineer	DEPP/MEH	95329171	
5	Susumu GAZURUO	Sen. Rep.	JICA Laos	551-7635	
6	Nakanishi, M.	Chief Adviser	IPSM team	5889-3800	
7	Hirokazu Kinoshita	Expert	IPSM team	5461-6812	木下
8	Hironoki Fujiwara	JICA Expert	IPSM team	—	
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