Environmental and Social Annual Monitoring Report

Project Number: 43903 (Loan 2722)
December 2012

PAKISTAN: Uch-II Power Project
Environmental and Social Development Annual Monitoring Report (FY2012)

Asian Development Bank

ENVIRONMENTAL AND SOCIAL MONITORING REPORT FY 2012

A	**Project/Business Name and Summary Information**	
Development of 404 MW Gas Fired Combined Cycle Power Plant by Uch-II Power (Private) Limited		
(i)	*Location of project/business*	Dera Murad Jamali, Baluchistan, Pakistan
(ii)	*Nature*	Construction, commissioning and operation of gas fired combined cycle power plant
(iii)	*Scale/size*	404 MW (ISO Gross Rating) 2 Gas Turbines x 01 Steam Turbine
(iv)	*Date of construction/operation commencement*	Construction activities commenced in July 2011. Based on current rate of progress Project COD is expected by end of December 2013
(v)	*Name, designation and signature of person responsible for preparing/reviewing the report*	Fida Muhammad Khan, Manager HSE Uch-II / Babar Saeed Khan, Deputy General Manager Construction Uch-II
B	**Relevant Environmental Permits or Compliance Certificates**	
(i)	*Summary of permit conditions & media(s) covered*	"No Objection Certificate issued by BEPA"
(ii)	*Issue by which government Agency*	Baluchistan Environmental Protection Agency (BEPA)
(iii)	*Issuance date and duration of validity*	December 9, 2010 (Extension required before Operational Phase)
(iv)	*Renewal requirements*	None
C	**Incidents of Violations or Non-Compliance**	
(i)	*Recorded date and responsible agencies*	None in Year 2012
(ii)	*Nature of non-compliance*	No reportable incident to authorities recorded during Year 2012.
(iii)	*Violation or non-compliance based on what environmental standards and regulations*	N/A
(iv)	*Recorded dates and authorities*	During Year 2012, EHS related observations of minor nature recorded during routine site monitoring. Log with corrective actions attached as Appendix A.
(v)	*Media or community reactions (if any)*	None in Year 2012
(vi)	*Corrective actions, deadlines, identification of responsible parties*	Short term corrective actions identified thru regular site walks. Please refer to Appendix-A.
	(a) short--term: remedial action	Please refer to Appendix-A.
	(b) long-term: preventative measures	None in Year 2012
D	**Incidents of Environmental and Safety Accidents**	
(i)	*Incident recorded dates and responsible agencies,*	None in Year 2012
(ii)	*Scale of damage and injury (if any)*	None in Year 2012
(iii)	*Authorities in charge of investigation/recording*	EPC contractors site management and HSE team is responsible for reporting and investigating the incidents
(iv)	*Media or community reactions (if any)*	None in Year 2012
(v)	*Corrective actions, deadlines, identification of responsible parties*	None in Year 2012
	(a) short--term: remedial action	None in Year 2012
	(b) long-term: preventative measures	None in Year 2012
E	**Labour Relations and Conditions**	
(i)	*Nature of labour dispute or grievance*	None reported by EPC in Year 2012
(ii)	*Legal requirements, Permit conditions and renewal requirements*	None in Year 2012
(iii)	*Authorities in charge of investigation/recording*	EPC contractor responsible for managing its labour relations and conditions

(iv)	*Media or community reactions (if any)*	None in Year 2012
(v)	*Corrective actions, deadlines, identification of responsible parties*	N/A
(vi)	*Labour relations and living conditions for construction labour force*	No Labor related issues recorded in Year 2012. Majority of labour residing at site in dormitories with satisfactory living conditions. Basic Medical facility with a qualified Doctor and nurse also available at site. EPC contractor's labour policies are in compliance with ILO core labour standards. EPC contractor use to revisit payrolls of labour as per requirement of Government policies (GOP minimum wages applicable in each cadre and local market). EPC workers also insured (group life insurance) as per national law. As per contractor's procedure "Camp and Security Management" In-charge Personal & Administration dept. at project site is responsible for maintenance of working and living conditions at site. Regular housekeeping inspections, hygiene inspections for messing facilities, toilet facilities in labour housing compound are performed by site HSE team. A mechanism for registering of complaints is available for labour. Workers complaint register and complaint drop boxes available at site and camp. No labour union exists at project site.
F	**Environmental Capacity**	
(i)	*Staff capacities in environmental management (as relevant)*	Please find the EHS Organogram indicating Uch-II, Owners Engineer and EPC team attached as Appendix B. Uch-II HSE Manager and HSE Officer are already at site whereas HSE Engineer has not been engaged, yet. Hiring of HSE engineer is expected to be completed by mid of 2013.
(ii)	*Degree of awareness of: (i) environmental management, (ii) health and safety, (iii) environmental laws and regulations*	Relevant EPC, OE and Uch-II staff aware about the Project EMP & H&S Mgt plan and all other Environmental applicable & relevant Laws and regulations.
(iii)	*Training programs carried out*	EPC contractor carrying out regular site HSE induction as per their procedure for its entire staff as well as subcontractors. Specific in house trainings regarding environmental awareness, work at height protocols, heavy lifting, fire fighting, first aid, hot work, safe driving, scaffolding protocols, JSA / RA, incident investigation, confined space entry, HAZMAT and other relevant topics carried out by EPC Health & Safety management team. Altogether a total of 4657 workers trained on different EHS topics in Year 2012. HIV/AIDS/STD orientation is not covered yet under the In-house HSE Training program. Appendix C *(EPC In house Training Statistics FY- 2012)*
(iv)	*Needs assessment of environmental management capacity (as relevant)*	EPC, EHS staff capacity monitored regularly for effective implementation of EHS Program. Uch-II hiring of additional HSE Engineer (Tentative up to COD) is expected to be completed by mid of 2013.
(v)	*Compliance audits carried out*	Uch-II biannual HSE audits FY-2012 carried out as per plan. Appendix D (Corrective Action Plan Matrix) EMP December-2011 and June-2012 Biannual Audit.
G	**Stakeholder Consultation/CSR Activities**	
(i)	*Details of consultations, if any, with local communities, nongovernmental organizations, civil society groups, and other stakeholders, including affected people*	None has been conducted in Year 2012
(ii)	*Describe efforts to promote community relations and local development for inhabitants of the project area.*	Local manpower employed in project by EPC contractor and subsequently trained unskilled workers. EPC contractor assisted community and flood victims by providing food stuff, tents, blankets and clean drinking water during devastated flood (Q3-Q4) year 2012.

		No migration / movement of communities residing in the vicinity of project site.	
(iii)	*Project procedures for (a) hiring and (b) acquisition of goods and services*	EPC labour hiring procedure in place. Historical data of the labor hired in construction activities is presented in attached Appendix-G.	
(iv)	*Provide List of grievances and status of grievance resolution*	None in Year 2012. Grievance redress mechanism and LPU & GRTG available and in place.	
H	**Issues, Status of Implementation of Mitigating Measures in the Environmental and Social Management Plan and Compliance with Environmental Qualities and Standards (national and international, as relevant) and Environmental and Social Requirements**		
	Parameter	**Issue**	**Status**
1	*Air*	None	Dust monitoring and suppression with water sprinkling on-going on the vehicles movement tracks / roads both on & offsite.
2	*Water (surface and ground water)*	None	Overall compliance with EMP (as applicable against specific parameters) in place. Significant increase in potable water demand is attributed to increase in manpower at site (approx. around 2000) by end of year 2012 as required by the project activities. Attached is Appendix E, indicating waste water Analysis & water consumption record FY 2012.
3	*Waste generation and management*	None	Waste generated at site is being collected, segregated and quantified. Hazardous waste generally comprised of used oils, oily filters & rags etc. is disposed off site through a recycling waste contractor on regular basis. Construction site sewage water disposal arranged to DMJ municipal area. Attached is Appendix E indicating waste generation record FY 2012.
4	*Noise and vibration*	None	EPC contractor monitoring ambient & occupational nose levels on monthly basis. Attached is Appendix E indicating occupational and ambient noise monitoring results. Ambient noise level data of North East corner has been included in Appendix-E. Following mitigation measures are adopted at areas of high noise. a) High noise warning signs are displayed at areas of high noise. b) Use of hearing protectors (ear plugs / ear muff) by staff are ensured at high noise locations. c) Regular maintenance / tuning of construction equipment and machinery to minimize noise pollution. d) Regular tool box talks are conducted with workers to communicate the hazards of high noise and preventive measures to be taken.
5	*Occupational health and safety*	None	Monitoring of Health & Safety Key performance Indicators done by EPC. Site medical centre / officer maintaining workers health records for reported cases.
6	*Community safety and security*	None	Community safety and security are ensured at project site through effective implementation of mitigation measured proposed by project environmental management plan. The mitigation measures include; development of traffic management plan to minimize disturbances to local communities, established a grievance redress management system to handle and resolve any community complaints that arise during construction and operation

			phase, limiting the non-local staff within the boundary wall of power plant to avoid project workforce and community interaction. EPC contractors SOP for security arrangements is also in place.
7	*CO_2 emissions by the Project*		4543.716 tons of CO_2 for site Diesel Gens sets and vehicular CO_2 emissions for construction site reported in year 2012 by EPC contractor. Calculations based upon total Diesel fuel used for the same purpose by EPC and its subcontractors. Total volume of fuel (HSD) consumed FY 2012 = 1714610 litres approx.. Assumptions used in total calculating CO2 emissions provided in Appendix F.
8	*Environmental and Social Management Plan, including IFC E&S Action Plan (September 29, 2010)*		Project H&S plan and EMP implementation and monitoring in place by EPC contractor. Attached Appendix H summarizes the compliance status of mitigation measures for E&S plan (Ref Appendix A Table 4-1 of EIA) ESAP Update: OGDCL and NTDC's EIA has been completed and attached as Appendix-I. OGDCL public consultation expected in April 2013 for obtaining NOC from BEPA. NTDC waiting for further instructions from BEPA.

I Summary Assessment of Client Performance and Recommendations

The construction activities comprising of foundation works for GT-I, GT-II, HRSG-I, HRSG-II, ST, HSD unloading pump, closed cycle cooling water pump and erection of fire & service water, demin water and potable water tank were completed. Cooling towers concrete/plaster work, laying of raw water pond geo-membrane, installation of disconnectors & circuit breakers at 220 KV switchyards and major shipments including GTs, ST and Generators, HRSGs modules, Main Transformers, and Station auxiliary have also been placed on their respective foundations in the period under review.

Since the inception of Uch-II project, EPC successfully completed a total of 3.9 million man hours without Lost Time Incident by end of Year 2012. HSE routine site monitoring, joint safety walks and housekeeping inspections carried out at project site as per plan. No significant safety incidents occurred during the period under review. HSE trainings provided to workforce and supervisors at site as per training plan.

EPC contractors' activities were closely monitored by Uch-II HSE management to ensure compliance with Project EMP and H&S procedures. Areas of weaknesses, mainly unsafe conditions, electrical hazards, fall hazards, PPEs non-compliance and issues related to housekeeping highlighted and corrective actions suggested for compliance.

No other significant Environmental & Social issues to report.

Uch-II Site Monitoring Summary FY-2012 *Appendix-A*

Corrective Actions

Monitoring Period	**Q-1, 2012**
Monitoring Conducted by	HSE Uch-II
Corrective Actions By	EPC Descon

S. No	Findings	Corrective Actions
1	Dust observed on movement track during dumpers / trucks movement • Environmental Hazard	Water sprinkling twice a day ensured on all vehicle movement tracks at site
2	Discarded oil and air filters disposed off in open area by a subcontractor • Housekeeping issue	Segregated waste container / skips provided at different location to store hazardous and non-hazardous waste
3	Fire-fighting arrangements at fuel storage area found insufficient • Fire Hazard	Foam trolley with sufficient amount of extinguishing media arranged and quantity of DCP fire extinguishers increased at fuel storage area
4	A grinder used by civil workshop found with too many cable joints and have no inspection tag available on it • Electrical Hazard • Inspection & test of portable hand tools	A schedule for inspection of power tools established by E&P dept. and damaged cable of pointed grinder replaced
5	At concrete batching plant, chemical drums placed without secondary containments • Unsafe condition • Chemical spill hazard	Secondary containments and drip trays beneath oil / chemical drums arranged
6	A scaffold tubular pipe found erected in the middle of the walkway leading to E&P workshop • Strike Hazard / Obstruction	Pipe removed thru area supervisor
7	A welding gas cylinder found without identification tag and placed in unsafe position • Unsafe Condition	A trolley stand along with chain arranged for gas cylinder secured storage and respective identification tag pasted on cylinder
8	Some contractor and visitor vehicles observed wrongly parked at site • Non-compliance of Traffic Management Plan	Designated parking area established and communicated admin dept. to ensure implementation of TMP
9	Some fainted safety signage observed at different locations at site and accommodation area • Unsafe Condition	Regular maintenance of safety signage ensured by HSE and new safety signs installed at site to enhance signage
10	A scaffolder was not wearing hand gloves while erecting scaffold • PPEs non compliance	Hand gloves provided to the scaffolder and counseling carried out with him by area supervisor

Monitoring Period	**Q-2, 2012**
Monitoring Conducted by	HSE Uch-II
Corrective Actions By	EPC Descon

S. No	Findings	Corrective Actions
1	Partial hard barrication found around piling area and HRSG foundations • Fall Hazard	Hard and soft barrication is introduced to avoid risk of falling
2	Masonry work performed by workers without wearing complete PPEs • PPEs non compliance	Tool box talk delivered to workers by supervisor and issued complete set of required PPEs
3	At fabrication shop, electrical motor of drill machine found without earthing/grounding • Electrical Hazard	Earthing of motor carried out immediately
4	Fire extinguisher was not available at shuttering yard • Unsafe condition	Fire extinguishers made available
5	Trailing cables found on the pathway to working area • Tripping Hazard	Trailing cables removed immediately
6	Scattered iron rods found near cooling tower construction area • Housekeeping Issue • Obstruction Hazard	Housekeeping carried out and area cleared
7	Unbounded waste material (wooden planks, debris etc.) found around administration building and residential camps • Housekeeping Issue	Housekeeping carried out and area cleared
8	A depression point observed at main approach road which may pose tilting of trucks and other vehicular damage • Road Transport Hazard	Depression area leveled and compacted to eliminate the risk
9	Oil water seepage observed around diesel generator at back side of Descon site office • Oil Spill Hazard	Immediately rectified the leakage source and cleared the spillage area & contaminated soil
10	Gas cylinders placed in unsecured position near water treatment area • Unsafe condition & Strike Hazard	Gas cylinders placed in safe position to eliminate the risk
11	A worker found working at height on Cooling tower shuttering without anchoring his full body harness to a secured point • Unsafe Act & PPEs non compliance	Tool box talk carried out by supervisor to communicate the hazard involved and to ensure PPEs compliance

Monitoring Period	**Q-3, 2012**
Monitoring Conducted by	HSE Uch-II
Corrective Actions By	EPC Descon

S. No	Findings	Corrective Actions
1	At cooling towers area, water accumulated around an electrical panel and electrical cables • Electrical Hazard	Source of water leakage rectified. Damp soil and accumulated water removed to eliminate electrical risk
2	Hard barrication missing around a 5 feet deep pit at clarifier area. Scaffolding pipes found scattered around the area • Falling Hazard • Housekeeping Issue	Hard barrier installed at the pointed location and housekeeping of the area performed to remove the scaffolding pipes
3	A fabricator working near diesel generator (high noise area) observed without wearing ear protectors • PPEs non compliance • Occupational Health Hazard	TBT carried out with fabricator to communicate the hazards of high noise. Area supervisor was called and advised to ensure PPEs compliance
4	At fabrication shop, a welding plant found un-inspected • Unsafe Condition	Workers were advised not to use the un-inspected machines until inspected by E&P dept. Area supervisor informed E&P for immediate inspection
5	Insufficient and inadequate food waste storage arrangements observed at contractor workers canteen • Biological Hazards	Admin dept. is advised to provide sufficient bins for food waste storage and effectively implement waste management plan at canteens / mess
6	Outside first aid center, an empty fire extinguisher (zero pressure) found and its safety pin was also missing • Unsafe Condition	Empty fire extinguisher was removed and replaced with filled one. HSE team is advised to ensure the monthly inspection of fire equipment
7	Debris (construction waste) found in area between STG and HRSG units • Housekeeping Issue	Area supervisor was informed to clear off the area and waste was removed
8	At HRSG unit, an approach without guard rail was posing severe falling hazard • Unsafe Condition • Falling Hazard	Site supervisor is asked to immediately remove this unsafe access. Proper access arrangement with guard rails were made to eliminate the risk of falling

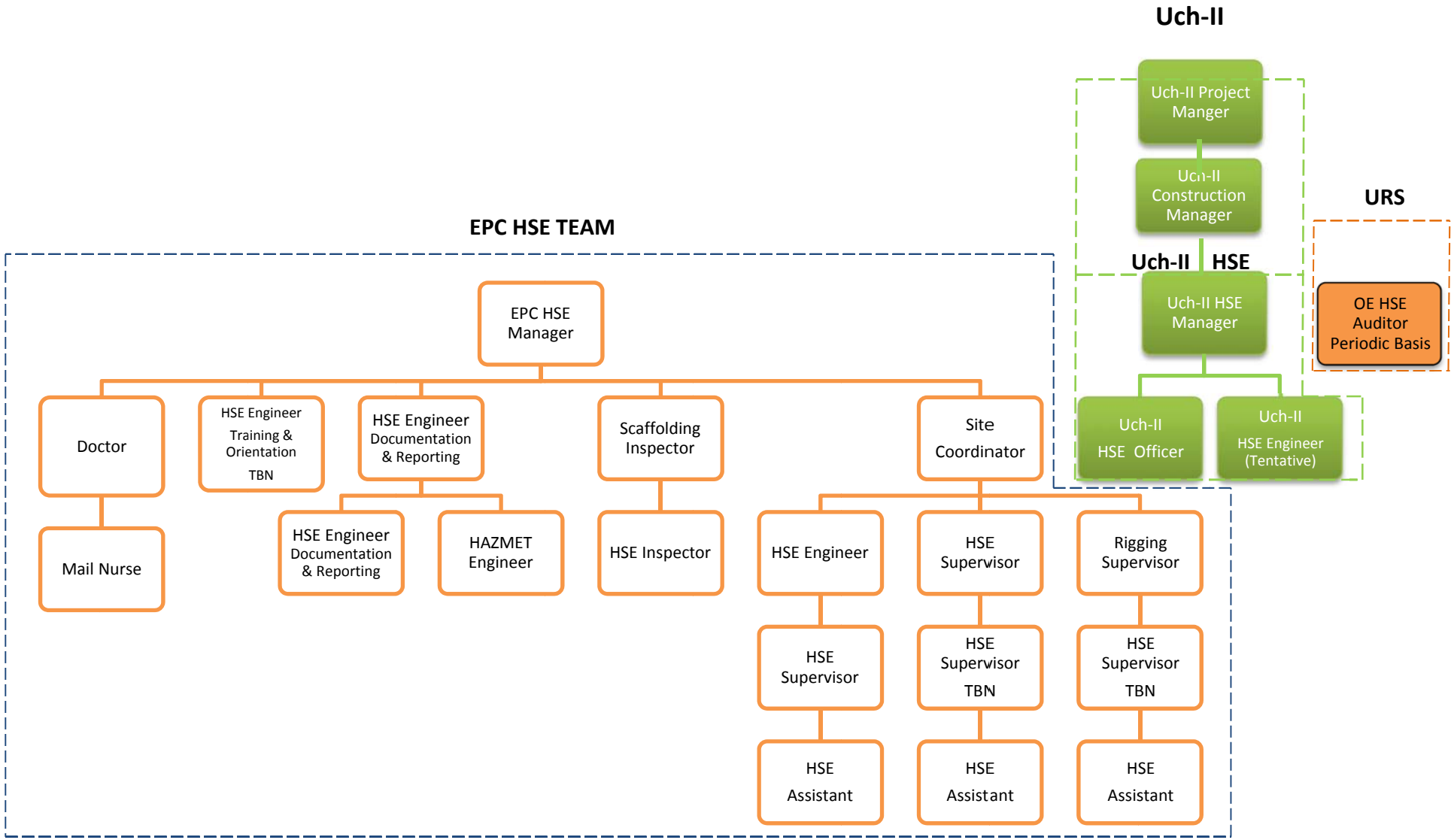
Monitoring Period	**Q-4, 2012**
Monitoring Conducted by	HSE Uch-II
Corrective Actions By	EPC Descon

S. No	Findings	Corrective Actions
1	No safe guard/railing installed at open end at the top of HRSG module-I • Falling Hazard	Hard barrier / safe guard installed at the pointed location to avoid risk of falling
2	A crane found engaged in lifting activities near CCR building. No bank man/flag man was deputed for crane's movement • Non-compliance of TMP	Counseling of crane operator carried out and E&P dept. is advised to ensure the availability of signal man
3	At switch yard , an electrical distribution panel found in damaged condition without cover/shed over it • Unsafe Condition • Electrical Hazard	Damaged DB has been replaced and shed provided over it
4	A junk of paper waste observed outside site first aid center • Housekeeping Issue	Paper waste removed from subject location & Admin dept. is addressed to ensure the collection and disposal of waste as per waste management plan
5	A worker observed standing at height over foundation of gas turbine generator without wearing safety harness • Non Compliance of work at height protocols	Counseling with the worker carried out to communicate the falling hazards
6	Waste material (wooden pieces, shuttering material, debris etc.) found scattered at back side of cooling tower • Housekeeping Issue	Housekeeping of the area carried out
7	Water puddle created around a water tank due to continuous leakage from tap • Housekeeping Issue	Water leakage issue has been rectified
8	While performing coating work inside Demin water tank, confined space protocols not followed • Non-compliance of confined space protocols	Confined space protocols ensured at site by EPC
9	A worker observed performing grinding work without wearing safety shoes • PPEs non compliance	Counseling with worker carried out and area supervisor advised to ensure the PPEs compliance
10	A grinder was used at admin building area without grounding • Electrical Hazard	Grounding provided

Appendix-B

Uch-II (404 MW – ISO) CCGT Power Project

HSE Management Organization Structure



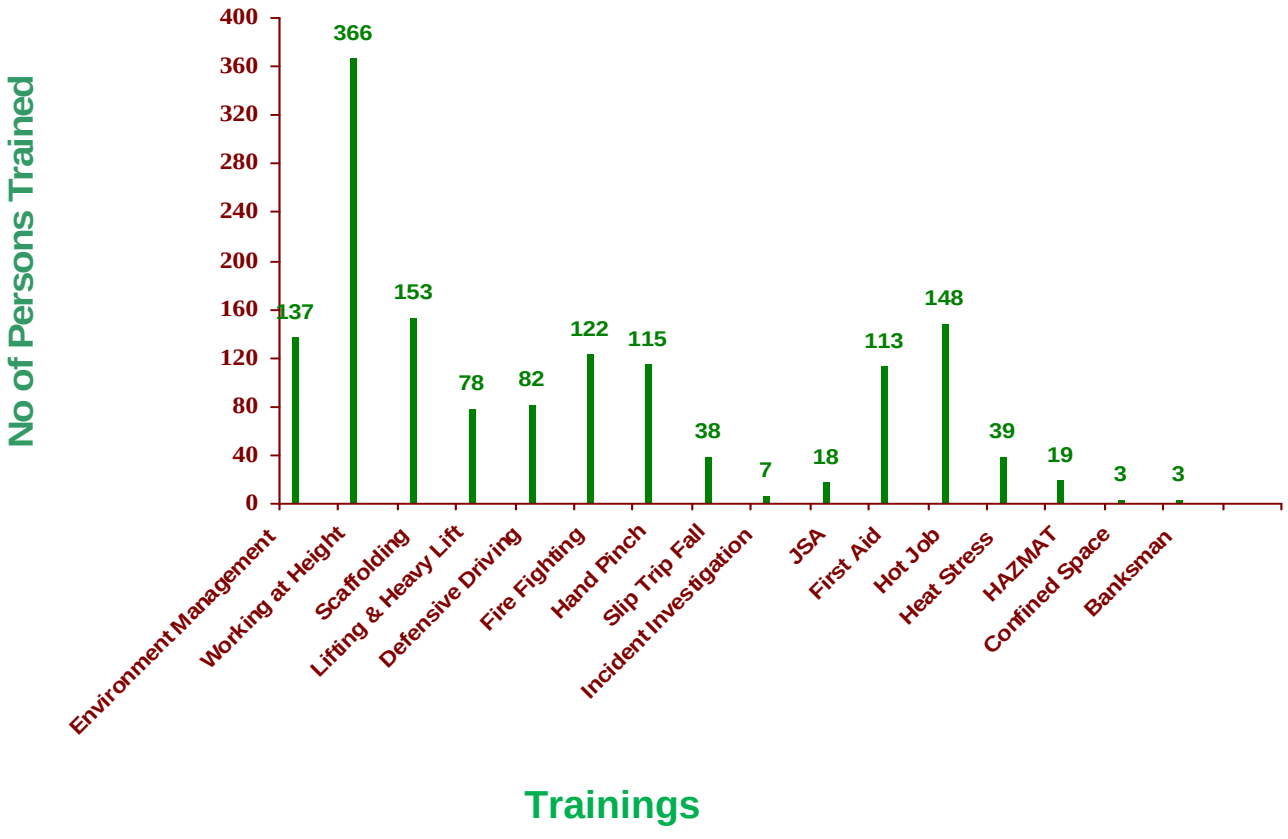
Uch-II	02 (Uch-II HSE Manager and HSE Officer are already at site whereas HSE Engineer has not been engaged, yet. Hiring of HSE engineer is expected to be completed by mid of 2013.)
EPC Total Strength	19
EPC Position Vacant	03
TBN	To be nominated

EPC (Descon) In house HSE Training Record
FY 2012

Training Topics	Q-1, 2012	Q-2, 2012	Q-3, 2012	Q-4, 2012	Total
HSE induction	461	863	635	1257	3216
Environmental Management	5	33	6	93	137
Working at Height	102	83	79	102	366
Scaffolding	13	22	41	77	153
Lifting And Heavy Lift	22	8	29	19	78
Defensive Driving	44	16	5	17	82
Fire Fighting	47	18	27	30	122
Hand Pinch	53	26		36	115
Slip Trip Fall		5		33	38
Incident Investigation			2	5	7
JSA			11	7	18
First Aid	17		52	44	113
Hot Job	20	27	29	72	148
Hear Stress / Exhaution	23	16			39
HAZMAT	14		5		19
Confined Space			3		3
Banksman	1	2			3

FY-2012	4657

* HIV/AIDS/STD orientation is not covered yet under the In-house HSE Training program.



Appendix D

Corrective Action Plan Matrix
(EMP Audit December 2011)

No	EMP Action Item	Status As of End Dec 2011	Planned Finish Date	Status 30 April 2012	Remarks	Status 30 May 2012
1	**Environment Management system**					
1.1	***Environmental Policy Uch II Project construction site***					
	Environmental policy Uch-II to be made site specific.	COMPL	31-12-2011	COMPL	An Urdu version is also recommended to be developed.	Compliant
2	**Environmental KPIs**					
2.1	*Record of HSE Induction Key personnel & Supervisors to date arrived at site*					
	HSE induction to be aligned with EMP.	Action Awaited	31-12-2011	COMPL	HSE induction provided to all personnel involved in EPC work	Compliant
2.2	*Environmental Incidents record since mobilization.*					
	Environmental Incident records to be maintained on daily basis on EHS monitoring sheet.	Action Awaited	31-12-2011	COMPL	Environmental incidents are being recorded on daily basis	Compliant
3	**Emergency Planning and Preparedness**					
3.1	*Oil & Chemical Spill control drills plan*					
	A detailed procedure to be developed in addition to existing spill response flow chart.	Action Awaited	31-12-2011	COMPL	Spill response flow chart in place at site is the part of DIMS.	Compliant
3.2	*All minor / major Environmental incidents to be investigated, CARs addressed on daily basis*	COMPL	31-12-2011	COMPL	Incident investigations performed	Compliant
4	**Grievance Handling Procedure**					
4.1	*GRP Implementation*					
	EPC to nominate LPU & GRTG members so that GRP can be finalized and implemented	Action Awaited	31-12-2011	COMPL	LPU & GRTG formed and GRP implemented	Compliant

4.2	*Social Complaint Register (SCR)*					
	Social Complaint Register (SCR) to be made available at gate	COMPL	31-12-2011	COMPL	SCR available	Compliant
5	**Dust Control on Construction site**					
5.1	*Dust control routines records*					
	Dust control activates records to be maintained	COMPL	31-12-2011	COMPL	The dust control activity was being performed. EPC asked to maintain its record as well.	Compliant
6	**Equipment and machinery/ vehicle exhaust emissions**					
6.1	*Monitoring of Equipment and machinery/ vehicle exhaust analysis of Oxides of nitrogen and sulphur, CO, PM10, smoke at the time of equipment/vehicle is inducted in pool & annually.*	Action Awaited	15-01-2011	Action Awaited	Third party vehicular / equipments emission testing completed on May 05, 2012.	Compliant
7	**Waste water analysis**					
7.1	*Analyze the waste water on monthly basis*	Action Awaited	15-01-2012	COMPL	Analysis performed and Sample also sent to 3rd party lab as well.	Compliant
8	**Fresh Water consumption**					
8.1	*Water consumption recorded on monthly basis*					
	Record water consumption data through a meter rather than an estimate.	COMP	31-12-2011	COMPL	Flow meter installed since January 2012	Compliant
9	**Solid Waste management**					
9.1	*Solid waste management, inspection, segregation and disposal.*	Action Awaited	15-01-2012	COMPL	Waste generated at site is being collected, segregated and quantified	Compliant
10	**Construction Noise**					
10.1	*Ambient noise levels at plant boundary on monthly basis*					
	Monitor boundary wall ambient noise level on monthly basis.	COMP	31-12-2011	COMPL	Dec-11 data available through UPL boundary noise monitoring, EPC monitoring implemented from Jan-12 onwards.	Compliant
10.2	*Occupational noise levels at machines / noise generating sources (1m)*					
	EPC contractor to monitor occupational noise as per EMP.	COMP	31-12-2011	COMPL	Occupational Noise monitoring carried out from Jan-12 onwards.	Compliant
11	**Machinery**					

11.1	*Approval and suitability of machinery inspection certificates upon arrival for use.*					
	Vehicle Inspection certificates to be provided by EPC	Information awaited	30-01-2012	COMPL	Vehicle certificates available	Compliant
12	**Fuel and chemical handling**					
12.1	*Secondary containment and Notices of material in place*					
	Provide secondary containment around oil and chemical storage	COMPL	31-12-2011	COMPL	Signage needs improvement.	Compliant
12.2	*Daily inspection check sheet for fuel storage*					
	EPC contractor to prepare monitoring sheets for recording Fuel and chemical hazards on daily basis.	COMPL	31-12-2011	COMPL	Daily check on Daily HSE report available	Compliant
13	**Housekeeping**					
13.1	*Are Recyclable material Bins available*	COMPL	15-01-2012	COMPL	Bins placed at site	Compliant
13.2	*Waste scrap material waste skips available*	COMPL	15-01-2012	COMPL	landfill area designated	Compliant
13.3	*Daily Housekeeping survey of all project sites, areas maintained*	COMPL	15-01-2012	COMPL	Daily monitoring record maintained	Compliant

Corrective Action Plan Matrix
(EMP Audit June 2012)

No	EMP Action Item	Responsibility	Planned Finish Date	Status 08 August 2012	Remarks	Status 31 December 2012
1	**Environment Management system**					
1.1	*Environmental Policy Uch II Project construction site*					
	Environmental policy Uch-II to be communicated to all personnel approaching the site	EPC	15-08-2012	COMPL	Environmental policy is a part of HSE induction	Compliant
1.2	*Adequacy of HSE Induction in line with EMP*					
	All aspects of EMP must be part of HSE induction	EPC	15-08-2012	COMPL	All important features of EMP are included in induction along with visual effects	Compliant
2	**Environmental KPIs**					
2.1	*Environmental Incidents record since mobilization.*					
	Quality of incident investigations to be improved	EPC	20-09-2012	Action Awaited	Incident investigation techniques training of EPC HSE Engineers carried out	Compliant
3	**Emergency Planning and Preparedness**					
3.1	*Oil & Chemical Spill control plan*					
	Oil & chemical spill recovery drills to be carried out on regular basis	EPC	30-08-2012	COMPL	Spill response exercises are being performed on monthly basis	Compliant
4	**Solid Waste management**					
4.1	*Solid waste management, inspection, segregation and disposal.*					
	Additional land fill area required for disposal of kitchen / food waste	EPC	05-09-2012	COMPL	Land fill area for food waste disposal is available	Compliant
5	**Machinery**					

5.1	*Machinery inspection certificates upon arrival for use.*					
	Vehicle Inspection certificates to be provided by EPC.	EPC	30-08-2012	COMPL	Third party certificates available. In-house inspection of cranes at site is in practice on monthly basis	Compliant
6	**Fuel and chemical handling**					
6.1	*MSDS of chemicals and notices at storage facility*					
	Simplified MSDS in Urdu language to be prepared and posted at respective locations	EPC	25-08-2012	COMPL	MSDS of all stored chemicals / oils are made available at storage area	Compliant
6.2	*Hazmat awareness TBTs*					
	Hazmat awareness TBTs to be provided to store staff	EPC	25-08-2012	COMPL	TBTs Provided to store staff	Compliant
7	**Housekeeping**					
7.1	*Waste collection, storage and disposal at site*					
	Hazardous waste generated from workshop needs to be recorded in monthly waste generation report	EPC	30-08-2012	COMPL	Hazardous Waste from workshop is being recorded	Compliant

Appendix E

Uch-II Waste Generation Statistics

Waste Type	Unit	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
Used oil	Ltr	440	720	827	630	840	988	832	624	100	875	560	764
Metal	Tons	3	2	3	5	2	3	2	1.5	1	2.7	10	8
Paper/ Plastic/ Glass	Kg	45	25	28	30	722	888	1041	805	640	946	1339	1784
Empty Cement Bags	Tons	2.23	2.44	5.51	5.05	2.69	3.8	7.7	5.6	0.8	2.09	3.78	4.5
Food Waste	Tons	2.1	2	2.2	2.4	2.7	3.35	3.91	3.02	2.4	3.55	5.02	6.7
Waste Water	m^3	3844	4176	4960	5006	3224	3360	3472	2480	1120	3412	3600	3672
Oil Filters & Oily Rags	Kg	—	—	—	15	18	20	19	15	2.5	20	17	20

Uch-II Waste Water Analysis

Parameters	NEQS Limit	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
pH	6--9	—	—	8.22	8.16	8.3	8.2	7.75	7.52	—	7.8	7.5	8
COD (ppm)	150	—	—	106	111	116	25.7	183	109	—	14.4	88	37
BOD (ppm)	80	—	—	59	51	54	64	54.9	58.4	—	55.1	49	41

Uch-II Water Consumption Record

Water Type	Unit	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
Raw Water	m^3	9118	4779	6154	4379	3174	3442	3328	3546	3053	3633	4545	5885
Potable Water	m^3	—	—	—	281	444	367	1683	1263	1321	301	1010	1308
Total Consumption	m^3	9118	4779	6154	4660	3618	3809	5011	4809	4374	3934	5555	7193

- Significant increase in potable water demand is attributed to substantial increase in manpower at site (approx. around 2000) by end of year 2012 as project activities comprising of mechanical installations and erection were at their peak.

Ambient Noise Levels (Decibels)

Location / Area	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12
North West Corner	52	51	43	41	43	55	52	52	58	49.5	50	60
South East Corner	45	47	51	51	53	42	50	50	63	51	49	47
South West Corner	71	74	76	77	89	52	50	50	48	63	70	48
Community West	43	43	41	45	47	38	45	45	46	45	42.7	44
Community South West	49	47	42	41	42	37	34	34	44	44	49	51
Pat Feeder (Pipeline Area)	50	47	55	56	47	79	70	75	61	49	54	55
North East Corner	49	52	43	47	45	58	-	50	55	49	55	57

Q-1, 2012 Occupational Noise Levels (Decibels)

Location / Area	Unit	Jan-12	Feb-12	Mar-12
Raw Water Pond	Decibel (dB)	74	67	66
Batching Plant	dB	76	78	83
Cranes	dB	77	72	68
Uch-II Gate	dB	49	52	43
Pile Area	dB	72	67	68

Q-2, 2012 Occupational Noise Levels (Decibels)

Location / Equipment	Unit	Apr-12	May-12	Jun-12
Raw Water Pond	Decibel (dB)	47	52	50
Batching Plant	dB	82	83	85
Crane	dB	67	74	80
Tractor (Belarus)	dB	84	84	86
Transit Mixer	dB	80	85	81
Office Generator	dB	95	93	93
Vibratory Roller	dB	79	85	82
Excavator	dB	77	77	76

Q-3, 2012 Occupational Noise Levels (Decibels)

Location / Area	Unit	Jul-12	Aug-12	Sep-12
Loader	Decibel (dB)	86	86	84
Grader (Komatsu)	dB	92	92	87
Power Grinder	dB	92	93	97
Welding Genset	dB	78	80	78
Vibratory Roller	dB	84	87	85
Diesel Engine (Uch-I Evap Pond)	dB	90	87	91
Excavator	dB	82	82	--

Q-4, 2012 Occupational Noise Levels (Decibels)

Location / Equipment	Unit	Oct-12	Nov-12	Dec-12
Raw Water Pond	Decibel (dB)	51	49	55
Batching Plant	dB	82	88	81
Generator (Fabrication Shop)	dB	88	92	90
Tractor (Belarus)	dB	85	81	85
Transit Mixer	dB	84	85	91
Mechanical Crane (450 Ton)	dB	87	83	85
Grader	dB	85	91	88
Excavator	dB	80	83	78

Following mitigation measures are adopted at areas of high noise.

a) High noise warning signs are displayed at areas of high noise.

b) Use of hearing protectors (ear plugs / ear muff) by staff are ensured at high noise locations.

c) Regular maintenance / tuning of construction equipment and machinery to minimize noise pollution.

d) Regular tool box talks are conducted with workers to communicate the hazards of high noise and preventive measures to be taken

Appendix-F

Diesel to CO_2 conversion Methodology

Standard diesel fuels generally contain around 87% carbon by weight, the rest being hydrogen and other very minor components. The amount of carbon in a liter of diesel fuel varies, but this only affects the total CO_2 production slightly.

- 1 liter of diesel typically weighs 0.83kg (the density is 830 kg/m^3)
- about 87% of this is carbon, so one liter of diesel contains 0.83 x 87%
  = 0.722 kg of Carbon.
- Each atom of carbon weighs 12 atomic units. When it combines with two atoms of Oxygen in the combustion process it becomes CO_2, which weighs 44 atomic units.

  The 0.722 kg of carbon in the original fuel then becomes 0.722 x 44/12
  = 2.65 kg of CO_2.
- So 01 liter of diesel fuel produces about 2.65 kg of CO_2.

Actual diesel consumed at site in Year 2012 = 1714610 liters
Total CO_2 produced = 1714610 x 2.65 = 4543716 Kg

Equivalent Tons of CO_2 produced = 4543.716 tons

Appendix-G

Number of Workers Engaged in UCH II Construction Activities

Q1-2012						Q2-2012				
	Local (Baluchistan Province)	Local (Rest of Pakistan)	Expatriate	Female Wokers	Total	Local (Baluchistan Province)	Local (Rest of Pakistan)	Expatriate	Female Wokers	Total
Skilled	8	616	17	0	641	12	703	17	0	732
Unskilled	71	35	0	0	106	102	99	0	0	201
Total	79	651	17	0	**747**	114	802	17	0	**933**

Q3-2012						Q4-2012				
	Local (Baluchistan Province)	Local (Rest of Pakistan)	Expatriate	Female Wokers	Total	Local (Baluchistan Province)	Local (Rest of Pakistan)	Expatriate	Female Wokers	Total
Skilled	19	648	17	0	684	27	942	17	0	986
Unskilled	130	138	0	0	268	157	290	0	0	447
Total	149	786	17	0	**952**	184	1232	17	0	**1433**

Appendix-H

Compliance Status of EMP Control Measures FY-2012

Uch-II Project

Environmental / Social Impacts	Control & Mitigation Measures	Monitoring Frequency	Responsibility	Compliance Status
Construction Noise	- Regular maintenance of machinery to reduce construction noise - Use acoustic panels around high noise machines - Monthly monitoring of Uch-II ambient & occupational noise	Monthly	EPC Contractor	Complied
Dust Emissions	- Daily monitoring of dust on roads and excavation areas - Water sprinkling at dusty areas / roads on daily basis - Use of dust masks by labor working in the dusty areas	Daily	EPC Contractor	Complied
Land Use	- Land update kept minimum required and restricted to existing compound area and within existing water supply pipeline		EPC Contractor / Uch-II	Complied
Water Sourcing	- Water consumption monitoring on monthly basis - Water conservation	Monthly	EPC Contractor / Uch-II	Complied
Vehicles & Equipment Emissions Testing	- Periodic maintenance / tuning of all vehicles used during project - Third party emissions testing as per defined frequency	Baseline when vehicle / equipment inducted in pool & subsequently after every year	EPC Contractor	Complied
Soil and Land Contamination	- Fuel, lubricants and chemical storage in covered bunded areas - Regular inspection of work areas and storage areas to detect any leakages/ spillage - Safe movement of chemicals and fuels - Spill emergency response procedure	Daily	EPC Contractor	Complied
Drainage & Storm Water Run-off	- Provision of proper drainage system at camp area and site area - Provision of storm water drainage system at entire site - Provision of following drainage system for power plant and all drains will discharge into evaporation pond after required treatment	Ongoing (throughout the project phase)	EPC Contractor / Uch-II	Complied

	• Cooling Tower blow down, Demin plant regenerated waste water, Sanitary wastewater, Oily wastewater and Sludge from clarifiers			
Camp Effluent	- Provision of proper septic tanks for construction camp effluents	Ongoing (throughout the project phase)	EPC Contractor	Complied
Hazardous & Non Hazardous Waste Management	- Segregation of hazardous & non hazardous waste - Waste storage at designated areas - Waste quantification on monthly basis - Non-hazardous waste disposal to proper landfill - Hazardous waste disposal through approved waste contractor	Monthly	EPC Contractor	Complied
Disturbance to Wild Life	- Preying and hunting is prohibited at Uch-II site for all kind of animals and birds - Any incident reported shall be investigated & controlled.	Ongoing (throughout the project phase)	EPC Contractor / Uch-II	Complied
Community & Power Plant Workers Safety	- Following traffic and heavy load movement plan - Monitoring safety hazards arising from traffic nuisance - Taking corrective actions to prevent reoccurrence.	Ongoing (throughout the project phase)	EPC Contractor / Uch-II	Complied
Traffic Disturbance	- Use of national highway for transportation - Traffic rush hours avoided for transportation of heavy loads - Follow speed limit rules	Ongoing (throughout the project phase)	EPC Contractor	Complied
Local Employment Conflicts	- Providing employment to labors, & semi-skilled local population	Ongoing (throughout the project phase)	EPC Contractor	Complied
Archaeological & Cultural Resources	- Monitoring excavation activities carefully - Upon discovering any remains of archeological significance immediately informing Uch-II and preserving them	Ongoing (throughout the project phase)	EPC Contractor / Uch-II	Complied
Project/Community Interface	- Non local project staff house in construction camp within boundary of power plant - Grievance handling procedure developed to handle community social & environmental complaints	Ongoing (throughout the project phase)	EPC Contractor / Uch-II	Complied