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ENVIRONMENTAL AUDIT REPORT ENVIRONMENTAL COMPLIANCE MONITORING OF MUZAFFARGARH THERMAL POWER STATION

VISIT 05

October 2013

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USAID ENERGY POLICY PROGRAM

ENVIRONMENTAL AUDIT REPORT

ENVIRONMENTAL COMPLIANCE MONITORING OF MUZAFFARGARH THERMAL POWER STATION

Visit-05

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Acronym

AEAI	Advanced Engineering Associates International, Inc
CEO	Chief executive Officer
CRRW	Chief Resident Representative WAPDA
EMMP	Environmental Monitoring and Mitigation Plan
FARA	Fixed Amount Reimbursement Agreement
HBP	Hagler Bailly Pakistan
ET	EMMP Implementation Team of MTPS
HSE officer	Health Safety and Environment Officer
ID	Identification number or code
MTPS	Muzaffargarh Thermal Power Station
NEQS	National Environmental Quality Standards
OHS	Occupational Health and Safety
USAID	United States Agency for International Development
WAPDA	Water and Power Development Authority

1. Introduction

The Government of United States of America through U.S. Agency for International Development (USAID) is funding Muzaffargarh Thermal Power Station (MTPS) repair and rehabilitation work (the 'Project'). Advanced Engineering Associates International, Inc. (AEAI) is providing monitoring and implementation support to USAID for the Project and, as part of it, has acquired the services of Hagler Bailly Pakistan (HBP) to undertake environmental compliance monitoring of the Project.

The purpose of environmental compliance monitoring is to assess the performance of the implementation team of the Project at MTPS (see **Exhibit 1.1** and **Exhibit 1.2**) against the Environmental Monitoring and Mitigation Plan (EMMP) during the rehabilitation and repair work.

For this purpose, HBP undertook fifth environmental audit (the 'audit') at MTPS. The results of the audit are documented in this report.

1.1 Environmental Audit Activities

The fifth visit for environmental audit was undertaken on October 07, 2013.

The activities undertaken during this visit included:

Opening Meeting with the plant management which was attended by the following:

- ▷ Mr Kahlid Alvi, Chief Engineer/ Technical Director, – Muzaffargarh Thermal Power Station
- ▷ Mr Muhammad Alyas, Additional Director, Chemical, – Muzaffargarh Thermal Power Station
- ▷ Mr Muhammad Akram, ARE Phase II, – Muzaffargarh Thermal Power Station
- ▷ Mr Abdul Rashid Bhatti, Senior Engineer, Phase I, – Muzaffargarh Thermal Power Station
- ▷ Mr Sajjad Hussain Abro, ARE Unit 4, – Muzaffargarh Thermal Power Station
- ▷ Noor Kamal Khan, Environmental Expert, HBP
- ▶ Walk through the plant to inspect the storage of equipment and sites, specifically where the Project activities either undertaken or closed recently under FARA agreement. This included the following:
 - ▷ New arrival equipment store area where met the store keeper and observed the stored equipment and material
 - ▷ Visit of units 1, 2, 3, 4, 5 and 6
 - ▷ Re blading of LP turbine rotor site
 - ▷ Air pre-heater elements site
 - ▷ ID Fan Rotor/Impeller and housings site

- ▷ Cooling tower fan accessories site
- ▷ Economizer tubes site
- ▷ Exhaust flue gas ducts site
- ▷ Waste storage yard
- ▶ General review of the existing site conditions and OHS practices
- ▶ Closing meeting with MTPS management to review the environmental documents and discuss the preliminary outcome of the audit.

1.2 Progress of Project

On the audit day, no major activity was underway. Most of the work was either completed or in near to complete.

A brief status of the Project as provided by AEAI and MTPS management is shown in **Exhibit 1.3**.

1.3 Environmental reporting

An effective mechanism for implementation of EMMP during the life cycle of the project is essential.

During the field visit, the plant management has provided latest report attached as **Appendix B.1**¹. Report seems good and comprehensive but attention required in some areas including occupational health and safety issues of the workers and waste management practices.

1.4 Summary of the results

During the audit, old issues revisited and observations were recorded. New issues of non-compliances were also recorded where replacement and rehabilitation work was underway at the plant. Out of 11 issues from previous visits, three were addressed. The remaining issues were discussed with the management of the plant who promised to close, along with new non-compliance observations at earliest. A summary of new, pending and closed issues is presented in **Exhibit 1.4**.

1.5 Trend

The visit-wise trend is shown **Exhibit 1.5**. During the current reporting period, the trend of recorded non-compliances were same as corresponding to the last visit. This is due to recording of new issues compare to same number of issues found addressed by the project team. However, the ET of the project should take notice seriously for early closure of these, especially the issues pending from the previous visits.

¹ Title page of the report is only attached due to big size of the report, while hard copy of the complete report is handed over to the office of AEAI

Exhibit 1.1: Project Location Map

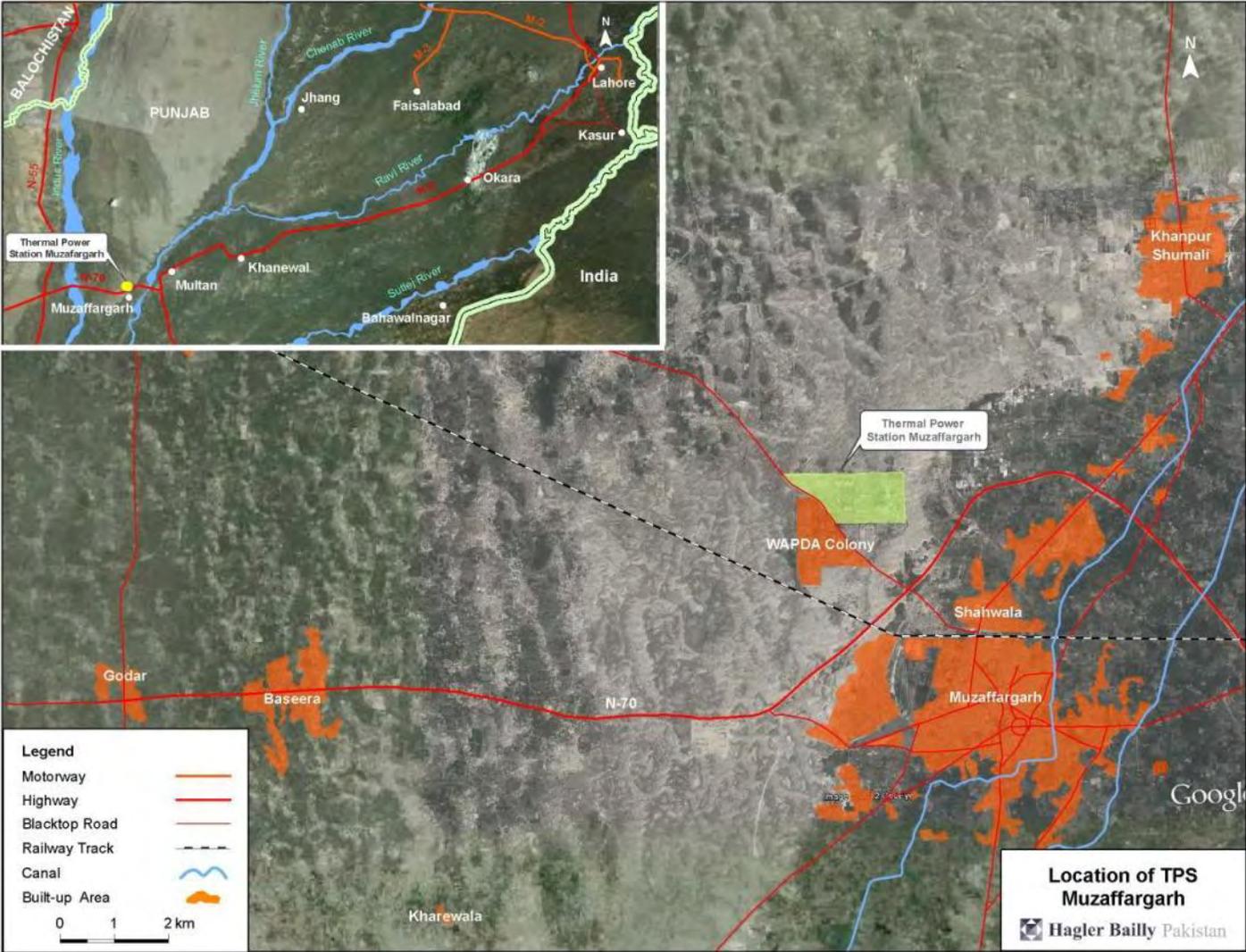


Exhibit 1.2: Satellite Image of the Plant

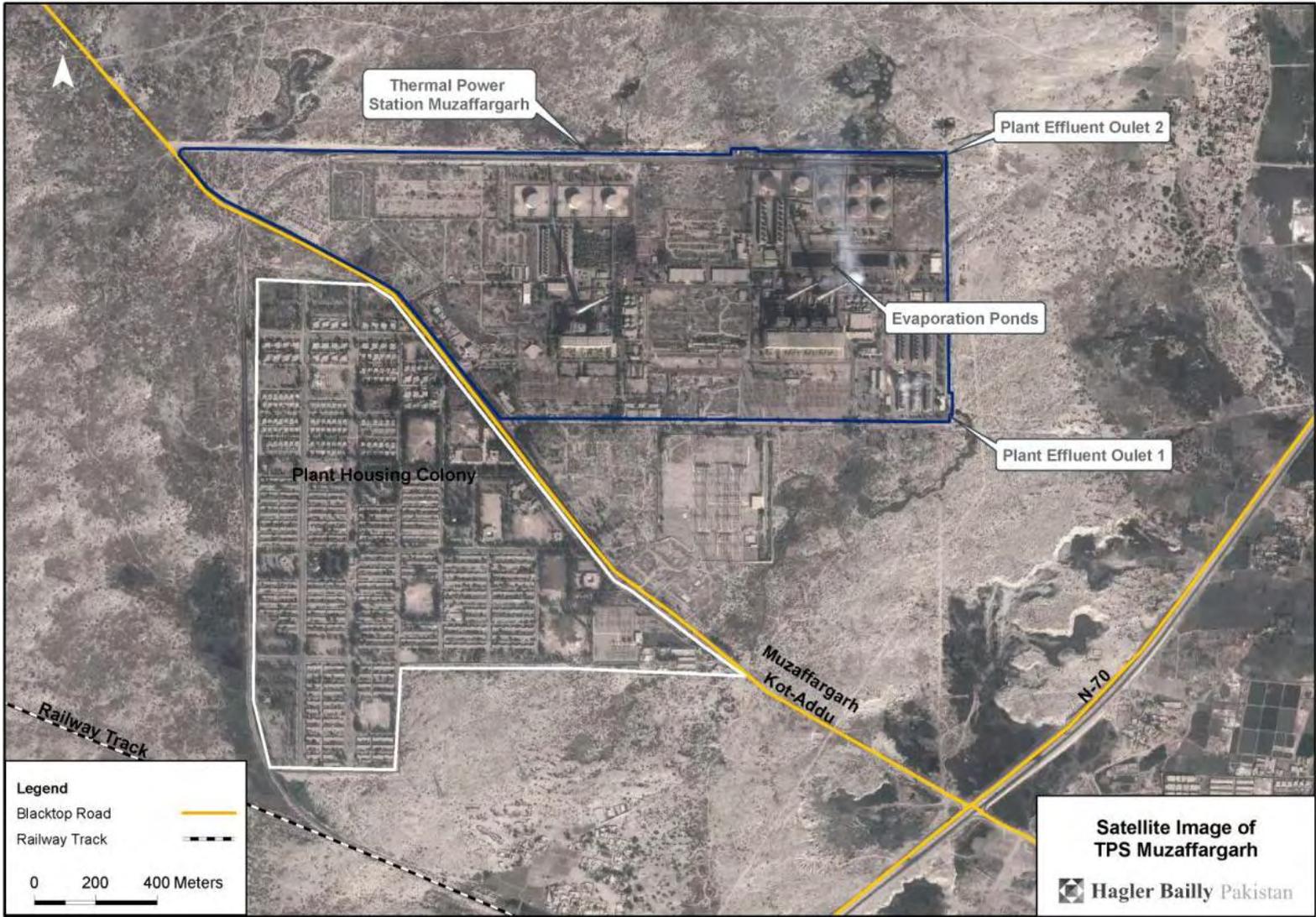


Exhibit 1.3: Progress of the Project

<i>Line Item No.</i>	<i>Unit No</i>	<i>Work Item description</i>	<i>Present Status</i>
1	1,2&3	Rehabilitation of boiler super heater tubes to overcome failure of tubes	Material received and installed. Waste (including iron (20,000kg), plastic and packaging) generated from the activity has been stored in the yard until disposal (as per EMMP Ref: Exhibit 4.1) to be finalized by the plant management. Claim for 100% reimbursed
2	1 to 4	Special Cooling Water Treatment.	PO issued on 25.03.2013. LC opened on 26.06.2013. Claim for 100% reimbursed
3	1 to 6	Use of Fuel Oil Additive as done on Unit-4 (450 Tons).	Material received at site. PO issued on 22.11.2012. LC opened on 21.01.2013. Claim for 100% reimbursed.
4	1,2&3	Replacement of Cold layer element for RAH (2 sets)	Material received and installed. Waste (including Iron (528 no.), cotton and plastic(200kg) and packaging) generated from the activity has been stored in the yard until disposal (as per EMMP Ref: Exhibit 4.1) to be finalized by the plant management. Claim for 100% reimbursed
5	1,2&3	Modification of Excitation system (3 set)	Tender opened in April 2012 and Bid Evaluation is in process. LOI issued on 19.04.2013. Performance bond is awaited from the supplier from last months; reminders have been issued but no response from the supplier. It is expected to be re-tendered again.
6	1,2&3	Electric motors for C.T. Fan (02 No) and for GRC fan. (01 No).	PO was issued on 23.09. 2011 for electric motors while LC opened on 02.02 2012 for GRC fan. Material received at site on 18.10.2012. Claim for 100% Payment reimbursed.
7	3	D.C. Storage batteries (01 Set).	Material received and installed. Waste (including packaging, wooden and plastic) generated from the activity has been stored in the yard until final disposal (as per EMMP Ref: Exhibit 4.1) to be finalized. Battery waste has been auctioned and disposed off as per procedure of the plant (see Appendix E). Claim for 100% reimbursed
8	1,2&3	220Kv circuit breaker SF6 type (06 No).	Material received at site. LC established on 03.08.2012. Claim for 100% reimbursed.
9	4	Re-blading of LP. Rotor (LP Turbine Rotor blades of row (6&7), pins & locking device).	Material received at site on 09.01.2013. Claim for 100% reimbursed.

<i>Line Item No.</i>	<i>Unit No</i>	<i>Work Item description</i>	<i>Present Status</i>
10	4	Air Pre-Heater Elements (Intermediate and Cold) 02 sets	Material received and installed. Waste (including iron, cotton and plastic, and packaging) generated from the activity has been stored in the yard until disposal (as per EMMP Ref: Exhibit 4.1) to be finalized by the plant management. Claim for 100% Payment reimbursed
11	4	Up-gradation of AVR System (01 set).	PO issued on 20.07.2012. LC opened on 12.10.2012. Claim for 100% Payment reimbursed.
12	4	Changing of UPS 1&2. (01 set).	Material received at site. Claim for 100% reimbursed.
13	4	DEH (01 set).	Re-Tender opened on 27.02.2013 and evaluation completed. LOI Issued on 22.08.2013.
14	4	Up-gradation of FSSS System (01 set).	Re-Tender opened on 27.02.2013 and evaluation completed. LOI Issued on 22.08.2013.
15	4	Up-gradation of TSI system BNC 3300 or equivalent (Turbine Supervisory Instrument) (01 set).	Re-Tender opened on 27.02.2013 and evaluation completed. LOI Issued on 22.08.2013.
16	1-6	Training and software/hardware cost for CMMS and off-line efficiency monitoring system. All Units	PO Issued for LOT-I and LOT-II but LOI issued on 29.08.2013 of LOT-III.
17	5&6	I.D. Fan Rotor/Impeller along with Housing and Dampers (04 Set).	Consignment received on 26.02.2011 and installed partially at unit 5. Waste generating during the work is temporarily stored on the ground then shift to the yard until disposal (as per EMMP Ref: Exhibit 4.1) to be finalized by the plant management. 90% claim reimbursed.
18	5&6	Air Pre heater Elements Hot end, intermediate & cold end layers along with seals for both units (04 Set).	PO issued on 20.07.2012. LC established on 12.10.2012 but some sub items was not procured. NPGCL will procure the remaining equipment's and then submit the claim. PO issued for the remaining equipment and CRRK office requested for establishment of LC on 29.08.2013.
19	5&6	Procurement of G.R.C. Fan Impeller/Rotor (01 Set).	PO issued and LC opened on 27.01.2012. Material received at site on 16.07.2012. Claim for 100% payment reimbursed.
20	5&6	Procurement of Cooling Tower Fan Gear Box & its parts. (06 No. gear box).	PO issued and LC opened on 27.01.2012. Material received on site on 13.08.2012. Claim for 100% payment reimbursed.

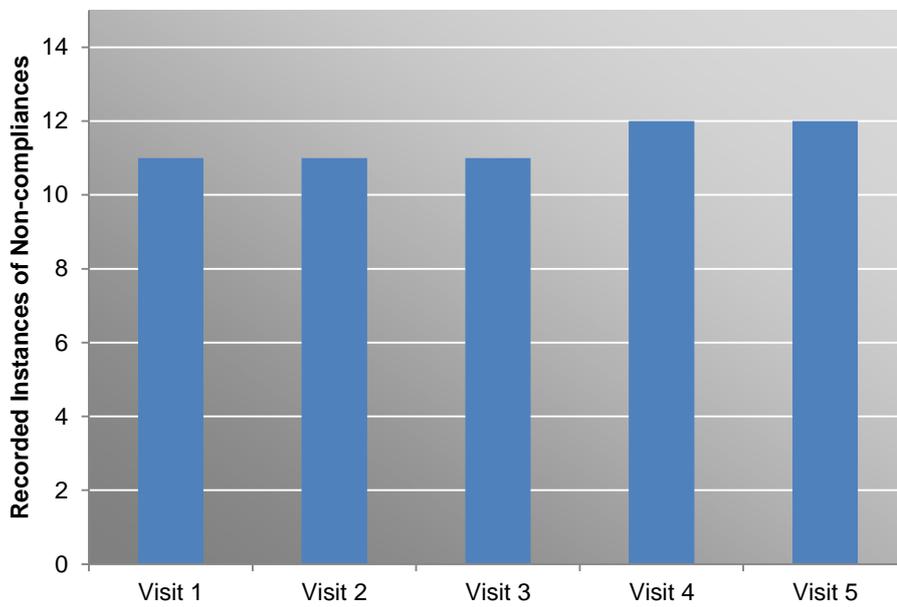
<i>Line Item No.</i>	<i>Unit No</i>	<i>Work Item description</i>	<i>Present Status</i>
21	5&6	Economizer Tubes for both Units (02 Sets)	PO issued and LC opened on 05.04.2012. Received at site on 25.10.2012. Claim for 100% Payment reimbursed.
22	5&6	IP Turbine Rotor (01 No).	PO issued on 14.06.2012. LC established on 12.10.2012. Claim for 100% Payment reimbursed.
23	5&6	Replacement of Damaged Exhaust flue gas ducts of material Russian Grade Steel sheets (50 M.T), Plate Type Heat Exchanger for Inner Water Cooling System of Generator and Motor for Starting Oil Pump (Vertical) Units 5-6	Material received at site. LC established for both the PO. Claim for 100% reimbursed.
24	5&6	Deleted	
25	5&6	Repair of winding and stator of Generators and testing	Tender opened on 28.11.2012. Evaluation completed and LOI issued on 26.08.2013.
26	5&6	Hydraulic coupling of Boiler Feed Water Pumps (01 No).	PO issued on 26.03.2013. LC established on 19.07.2013. Claim for 100% Payment reimbursed.
27	5&6	Modification of Excitation System	LOI issued on 15.03.2013 but cancelled on 27.08.2013 as the supplier did not provide performance guarantee. It will be re-tendered.
28	5&6	Procurement of 0.4KV Motors for Cooling Towers Fan and APH 02	PO issued and LC opened in April 2012. Material received at site on 15.10.2012. Claim for 100% payment reimbursed.
29	5&6	Procurement of 6.6KV Motor for C.W. Pumps, CP, ID Fan, FD Fan & BF Pumps (05 No).	PO issued and LC opened in April 2012. Material received at site. Claim for 100% payment reimbursed.
30	5&6	Procurement of 6.6/0.4KV Breaker (5 No. 6KV breaker, 18Nos. 0.4Kv Breakers).	LC opened on 12.10.2012. Claim for 100% reimbursed
31	5&6	Protection Relay for Generators.	Material received at site. Tenders opened and LOI issued on 24.02.2012. PO issued on 31.05.2012. LC established on 12.10.2012. Claim for 100% reimbursed
32	5&6	MK Breakers, Seal Oil Coolers, PMG	Material received at site. Claim for 100% payment reimbursed
33	5&6	Supply, Installation, Commissioning & Testing of complete distributed control system (DCS)	Re-tender opened on 27.06.2013 and under evaluation process.

<i>Line Item No.</i>	<i>Unit No</i>	<i>Work Item description</i>	<i>Present Status</i>
34	5&6	including field equipment like sensors, transmitter & actuators etc. for turbine governing system DEH-III and Boiler Turbine Auto regulation system YEWPACK-II Rehabilitation of Furnace safety Supervisory System (FSSS) including Furnace camera, flame monitoring & ignition system	Re-Tender opened on 30.1.2013 and evaluation completed. LOI issued on 27.08.2013.

Exhibit 1.4: Visit-wise Summary of Non-compliances

<i>Visit No.</i>	<i>Current Issues</i>	<i>Pending Issues</i>	<i>Total Issues</i>	<i>Issue Closed</i>	<i>Average Time Taken (Days)</i>	<i>Open Issues</i>
01	11	–	11	–	–	11
02	02	09	11	02	82	11
03	02	09	11	02	281	11
04	03	09	12	02	119	12
05	03	09	12	03	22	12

Exhibit 1.5: Visit-wise Trend in Recorded Non- Compliances



2. Register of Audit Observations

See **Exhibit 2.1** on following pages:

Exhibit 2.1: Register of Audit Observation

Serial Number	Issue ID	Visit No.	Issue	Photographic ID	Date Raised	Proposed Corrective Action	Responsibility	Target/ Revised Target Date	Status	Verification	Comments	Addressed Date	Days taken to Address/ Reason of Delay
Pending Issues from Last visits													
01	1-01	01	No evidence was available that the vehicles used for the transportation of project equipment were compliant with the national environmental quality standards (NEQs)	-	April 18, 2012	Vehicles used for the transportation are NEQS compliant for the emissions and noise (EMMP Ref: Exhibit 4.1)	ET	April 18, 2012 (1) October 31, 2012 (2) March 29, 2013 (3) May 17, 2013	No progress	-	MTPS has sent reminder letters to Chief Resident Representative WAPDA, who arrange vehicles for transportation of the equipment to MTPS under FARA, to ask contractor for the compliance of vehicle with the NEQs No response received yet	-	No progress so far, MTPS will send another reminder and tell them that their vehicle will not be allowed to enter MTPS without providing NEQS certificate.

Serial Number	Issue ID	Visit No.	Issue	Photographic ID	Date Raised	Proposed Corrective Action	Responsibility	Target/ Revised Target Date	Status	Verification	Comments	Addressed Date	Days taken to Address/ Reason of Delay
02	1-03	01	Training for occupational health and safety has not been scheduled	-	April 18, 2012	Training should be scheduled as per requirement (see EMMP Ref: Exhibit 4.2)	ET	May 1, 2012 (1) October 31, 2012 (2) March 29, 2013 (3) May 17, 2013 (4) October 15, 2013	No progress	-	HBP suggested to the EMMP implementation team (ET) of the project to initiate trainings of staff from basics, i.e importance and requirement of PPEs in personal safety at work site	-	No progress so far, MTPS have to provide training schedule for the staff before October 15, 2013

Serial Number	Issue ID	Visit No.	Issue	Photographic ID	Date Raised	Proposed Corrective Action	Responsibility	Target/ Revised Target Date	Status	Verification	Comments	Addressed Date	Days taken to Address/ Reason of Delay
03	1-06	01	Storage area for new equipment related to Unit 1, 2, 3, 5 and 6 Units were not demarcated and labeled	01	April 18, 2012	Storage area will be demarcated. Area will be either marked on the floor or cordoned off by tapes (see EMMP Ref: Exhibit 4.1)	ET	April 25, 2012 (1) October 31, 2012 (2) March 29, 2013 (3) May 17, 2013 (4) October 20, 2013	No progress	–	Plant management and ET may facilitate store keeper in arrangements	–	No progress was observed during the present visit. ET of the project needs to facilitate store keeper for arrangement of required items
04	1-07	01	Packing material waste record was not maintained and location was not known generated from Units 1, 2 3,4, 5 and 6	–	April 18, 2012	Inventory of all waste including packing material waste shall be prepared. For each type of waste the quantity and disposal mechanism shall be identified (see EMMP Ref: Exhibit 4.1)	ET	May 1, 2012 (1) October 31, 2012 (2) March 29, 2013 (3) May 17, 2013	No progress	–	For some items, generated waste amount has been recorded e.g. line item no.01 and 04.	–	Inventory need to be made for each type of waste generated. No progress recorded so far.

Serial Number	Issue ID	Visit No.	Issue	Photographic ID	Date Raised	Proposed Corrective Action	Responsibility	Target/ Revised Target Date	Status	Verification	Comments	Addressed Date	Days taken to Address/ Reason of Delay
05	1-08	01	Waste (iron, copper, packaging etc.) generated from Unit 5 and 6 were not segregated in waste storage area.	07, 08	April 18, 2012	In the store yard all waste shall be stored separately. No waste shall be stored within the passage way (see EMMP Ref: Exhibit 3.2).	ET	April 25, 2012 (1) October 31, 2012 (2) March 29, 2013 (3) May 17, 2013 (4) October 20, 2013	No progress	–	Waste (iron and cotton and wooden) needs to be segregated properly, stored at yard		No reason provided for not following the EMMP
06	1-09	01	Waste storage area of Unit 1, 2, and 3, 5 and 6 was not demarcated and labeled.	01, 02, 03, 04	April 18, 2012	In the yard all waste shall be marked (see EMMP Ref: Exhibit 3.2).	ET	April 25, 2012 (1) October 31, 2012 (2) March 29, 2013 (3) May 17, 2013	No progress	–	ET and Plant management needs to facilitate yard personnel	–	No such facility is available with the personnel at the yard The waste storage area of units 5 and 6 was demarcated and labeled only

Serial Number	Issue ID	Visit No.	Issue	Photographic ID	Date Raised	Proposed Corrective Action	Responsibility	Target/ Revised Target Date	Status	Verification	Comments	Addressed Date	Days taken to Address/ Reason of Delay
07	1-11	01	Final disposal of waste(iron, copper, packaging etc) has not been scheduled	-	April 18, 2012	The different types of waste should be timely disposed in accordance with the procedure mentioned in section 3 of EMMP	ET	May 1, 2012 (1) October 31, 2012 (2) March 29, 2013 (3) May 17, 2013 (4) November 30, 2013	No progress	-	Disposal of non-valued waste such as used cotton, plastic packages and other, needed to be disposed off appropriately.	-	Inventory of all waste completed. Final disposal will be completed at the end on November 2013
08	2-01	02	Iron waste stored in yards of Unit 5 and 6 is not properly marked.	01, 02, 03, 04	September 19, 2012	In the storage yard all waste shall be properly marked and segregated. A clear passage way marked by lines on the ground shall be left for walking of staff. No waste shall be stored within the passage way (EMMP Ref: 3.2).	ET	October 31, 2012 (1) March 29, 2013 (2) May 17, 2013 (4) November 10, 2013	No progress	-	Yard management personnel need to train on waste management so any waste that generated from the project activities should be documented, demarcated and labeled	-	No progress was observed

Serial Number	Issue ID	Visit No.	Issue	Photographic ID	Date Raised	Proposed Corrective Action	Responsibility	Target/ Revised Target Date	Status	Verification	Comments	Addressed Date	Days taken to Address/ Reason of Delay
New Issues from Recent Visit													
09	5-01	05	Waste (iron, copper, packaging etc.) generated from Unit 4 was not segregated, and also not stored at designated place	02	October 07, 2013	In the store yard all waste shall be stored separately. No waste shall be stored within the passage way (see EMMP Ref: Exhibit 3.2).	ET of Unit 4	Immediate	Open	-	Waste (iron and cotton and wooden) needs to be segregated properly and to store in designated area		
10	5-02	05	Storage area for new equipment related to Unit 4 was not demarcated and labeled	03	October 07, 2013	Storage area will be demarcated. Area will be either marked on the floor or cordoned off by tapes (see EMMP Ref: Exhibit 4.1)	ET of Unit 4	Immediate	Open	-	Plant management and ET may facilitate store keeper in arrangements	-	
11	5-03	05	Oil spills/ leakages were observed at storage yard of Units 1, 2, and 3	04	October 07, 2013	Oil shall be stored in designated and clearly marked areas and shall be lined with impervious flooring. The oil storage area shall have dykes constructed around it to control accidental leakages and spills (EMMP Ref: 3.2)	ET of Unit 1, 2, and 3	Immediate	Open	-	All oil spill/leakage should be collected and need to disposed- of properly at earliest	-	-

Serial Number	Issue ID	Visit No.	Issue	Photographic ID	Date Raised	Proposed Corrective Action	Responsibility	Target/ Revised Target Date	Status	Verification	Comments	Addressed Date	Days taken to Address/ Reason of Delay
Issues Closed													
12	1-02	01	MTPS has not formulated any environmental team to implement EMMP	-	April 18, 2012	Environmental team will be designated at each unit and their job description will be documented (EMMP Ref: section 4.5).	CEO and HSE officer	September 27, 2012	Closed	Yes	An environmental team has formed for each unit for implementation of EMMP	September 25, 2012	160
13	1-05	01	After the machines or equipment were used packing material waste from storage area was thrown at different places	05	April 18, 2012	All type of waste shall be collected and stored in separate bins marked for this purpose EMMP Ref: Exhibit 3.2	DD (MM S)	April 25, 2012	Closed	Yes	Removed and shifted to yard	April 25, 2012	05
14	1-10	01	No safety measures were taken in storage of the Lead acid batteries	-	April 18, 2012	Proper safety measures should be taken while handling, storage and disposal of these batteries as they contain toxic material (EMMP. Ref: 3.2) It is recommended that the batteries should be stored in shed areas away from direct sunlight and rain with impervious floor).	ET	July, 2012 (1) October 31, 2012	Batteries were auctioned as per WAPDA protocols.	Yes	Batteries were auctioned as per WAPDA protocols. The management has provided documentary evidence of final disposal	March 7, 2013	324

Serial Number	Issue ID	Visit No.	Issue	Photographic ID	Date Raised	Proposed Corrective Action	Responsibility	Target/ Revised Target Date	Status	Verification	Comments	Addressed Date	Days taken to Address/ Reason of Delay
15	2-02	02	Quantity and final destination of Lead acid batteries to be provided	-	September 21, 2012	<p>Inventory of all waste shall be prepared. For each type of waste the quantity and disposal mechanism shall be identified and where necessary, audit of the waste contractor (EMMP Ref: Exhibit 4.1)</p> <p>Lead and acid from these batteries should be removed from the used battery cells (EMMP Ref: Exhibit 3.2)</p> <p>The acid may be reused or recycled EMMP Ref: Exhibit 3.2</p> <p>Proper safety measures should be taken while handling, storage and disposal of these batteries as they contain toxic material (EMMP Ref: Exhibit 3.2)</p>	ET	October 31, 2012	Closed	Yes	<p>Batteries were auctioned as per WAPDA protocols.</p> <p>The management has provided documentary evidence of final disposal</p>	March 7, 2013	238

Serial Number	Issue ID	Visit No.	Issue	Photographic ID	Date Raised	Proposed Corrective Action	Responsibility	Target/ Revised Target Date	Status	Verification	Comments	Addressed Date	Days taken to Address/ Reason of Delay
16	1-04	01	New equipment (such as impellers near Unit 5 and 6 were stored at non designated area in the passage way	-	April 18, 2012	The new equipment shall be stored in properly demarcated and identified areas (see EMMP Ref: Exhibit 4.1)	ET of Unit 4	April 28, 2012 (1) October 31, 2012 (2) March 29, 2013	Closed	Yes	The new equipment were used/installed	March 15, 2013	230
17	3-02	03	Removed cooling tower fans and gear box from Unit 5 and 6 were found at undesignated area	-	March 7, 2013	After dismantling, all parts and machines shall be dispatched from site to storage yard as soon as possible, preferably on the same day (EMMP Ref: Exhibit 3.2)	ET of Unit 5&6	March 29, 2013	Closed	Yes	Removed items shall be stored in designated area with proper label and demarcation	March 15, 2013	8

Serial Number	Issue ID	Visit No.	Issue	Photographic ID	Date Raised	Proposed Corrective Action	Responsibility	Target/ Revised Target Date	Status	Verification	Comments	Addressed Date	Days taken to Address/ Reason of Delay
18	3-01	03	Personal protection equipment (PPEs) was not used by the workers appropriately noticed during major overhauling work of Unit 4, 5 and 6 turbine		March 7, 2013	Appropriate PPE shall be provided to the workers and it shall be ensured that the PPE are used. (EMMP Ref: 4.1). All the staff of the project should be trained to use PPE. Record of all training shall be maintained (EMMP Ref: Exhibit 4.1)	ET of Unit 4 and 5, 6	Immediate	Closed	Yes	PPEs need to be available for each worker	September 09 2013	According to ET, the PPEs were provided a month ago
19	4-01	04	Oil spills/ leakages were observed near Unit 5 and 6		April 15, 2013	Oil shall be stored in designated and clearly marked areas and shall be lined with impervious flooring. The oil storage area shall have dykes constructed around it to control accidental leakages and spills (EMMP Ref: 3.2)	ET of Unit 5 and 6	Immediate	Closed	Yes	All oil spill/leakage should be collected and need to disposed off at earliest	April 30, 2013	According to management, the oil spill/leakage were collected and disposed off soon after last visit

Serial Number	Issue ID	Visit No.	Issue	Photographic ID	Date Raised	Proposed Corrective Action	Responsibility	Target/ Revised Target Date	Status	Verification	Comments	Addressed Date	Days taken to Address/ Reason of Delay
20	4-02	04	Solid waste and plastic papers observed at unit 5 and 6		April 15, 2013	All type of waste shall be collected and stored in separate bins marked for this purpose (EMMP Ref: 3.2)	ET of Unit 5 and 6	Immediate	Closed	Yes	All waste should be collected and disposed off properly	April 30, 2013	According to management, the all waste were collected and disposed off soon after last visit
21	4-03	04	Sharp edged metal were observed left behind after completion of work at unit 5 and 6		April 15, 2013	Sharp edged metal shall not be left unattended at any time. It shall be moved to storage yard immediately after removal. In the storage yard, the storage area for such metal shall be cordoned off using clearly visible tapes. (EMMP Ref: 3.2)	ET of Unit 5 and 6	Immediate	Closed	Yes	All waste need to collected and disposed-off appropriately	April 30, 2013	According to management, the all waste were collected and disposed off soon after last visit

3. Areas of Concern and Corrective Actions

See **Exhibit 3.1** on following page:

Exhibit 3.1: Areas of Concern and Corrective Actions

<i>Issue</i>	<i>Issue ID/ Visit No. (see Exhibit 2.1)</i>	<i>Monitoring Indicator(s)</i>	<i>Proposed Corrective Action in EMMP</i>
Vehicles used for the transportation are NEQS compliant for the emissions and noise	▶ 1-01/ 01	Results of the noise and emissions	▶ Vehicles used for the transportation shall be monitored for the emissions and noise (EMMP Ref: Exhibit 4.1).
Trainings on occupational health and safety	▶ 1-03/ 01 ▶ 3-02/ 03	Documentation record and walk through audit observations	<ul style="list-style-type: none"> ▶ Appropriate PPE shall be provided to the workers and it shall be ensured that the PPE are used (EMMP Ref: Exhibit 4.1). ▶ The staff shall be provided with training in use of PPE (EMMP Ref: Exhibit 4.1). ▶ Proper scaffolding platforms shall be provided for all work areas located more than 1 m above floor level (EMMP Ref: Exhibit 4.1). ▶ First Aid facilities and fire protection devices should be placed in areas where activities will be performed (EMMP Ref: Exhibit 4.1). ▶ Ear protection device shall be used if the noise level is above 85 dB(A) (EMMP Ref: Exhibit 4.1).
Improper solid waste management	▶ 1-05/ 01 ▶ 1-07/ 01 ▶ 1-08/ 01 ▶ 1-09/ 01 ▶ 1-10/ 01 ▶ 1-11/ 01 ▶ 2-01/ 02 ▶ 2-02/ 02 ▶ 3-01/ 03 ▶ 4-01/ 04 ▶ 4-02/ 04 ▶ 4-03/ 04 ▶ 4-01/ 05	Quantity of waste generated, their classification and disposal mechanism	<ul style="list-style-type: none"> ▶ Inventory of all waste shall be prepared. For each type of waste the quantity and disposal mechanism shall be identified (EMMP Ref: Exhibit 4.1). ▶ Where necessary, audit of the waste contractor (EMMP Ref: Exhibit 4.1). ▶ Implementation of waste management plan presented in Section 3 of EMMP.

<i>Issue</i>	<i>Issue ID/ Visit No. (see Exhibit 2.1)</i>	<i>Monitoring Indicator(s)</i>	<i>Proposed Corrective Action in EMMP</i>
	<ul style="list-style-type: none"> ▶ 1-05/ 05 ▶ 3-05/ 05 		
Storage of new equipment	<ul style="list-style-type: none"> ▶ 1-04/ 01 ▶ 1-06/ 01 ▶ 2-05/ 05 	Walk through audit observations	<ul style="list-style-type: none"> ▶ The new equipment shall be stored in properly demarcated and identified areas (EMMP Ref: Exhibit 4.1). ▶ Separate storage of each item should be adopted and each area should be marked either on floor or cordoned off by tapes (EMMP Ref: Exhibit 4.1). ▶ Lifting equipment (cranes) used for the equipment shall follow the prescribed safety specification tapes (EMMP Ref: Exhibit 4.1). ▶ Material Safety Data Sheet (MSDS) for chemicals, if any, shall accompany the consignment. A copy of the MSDS shall be available near the storage area at all times tapes (EMMP Ref: Exhibit 4.1).

4. Waste Inventory and Disposal Record

As part of the EMMP, an inventory of the waste generated during the rehabilitation and repair activities is required. Inventory of various wastes generated during the rehabilitation project is listed in **Exhibit 4.1**. However, the data in the table is taken from the EMMP (except the data for line item no. 1 and 4, which was given by the plant management and provided only to indicate the relative magnitude of the generated waste. The ultimate disposal of the waste is to be provided by the management of the plant.

Exhibit 4.1: Waste Inventory and Disposal Record

Line Item No.	Estimated Generated Waste															
	Solid														Liquid	
	Steel/ Iron (kg)	Disposal Status	Copper (kg)	Disposal Status	Wool (kg)	Disposal Status	Batteries (No.)(kg)	Disposal Status	Plastic, Wood, Cloth & Packaging (kg)	Disposal Status	Electronics (kg)	Disposal Status	Soot (kg)	Disposal Status	Oil (liters)	Disposal Status
1	20,000	Kept in yard	-	-	-	-	-	-	50	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	40	-	-	-	-	-	-	-	800	-	-	-	-	-	-	-
4	250 no. Weight: ??	Kept in yard	-	-	-	-	-	-	200	Kept in yard	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	300	-	20	-	-	-	-	-	50	-	-	-	-	-	-	-
7	-	-	-	-	-	-	130	-	400	-	-	-	-	-	-	-
8	10	-	50	-	-	-	-	-	100	-	-	-	-	-	-	-
9	1,500	-	-	-	-	-	-	-	100	-	-	-	-	-	-	-
10	100	-	20	-	-	-	-	-	50	-	-	-	-	-	-	-
11	50	-	100	-	-	-	-	-	-	-	600	-	-	-	-	-
12	100	-	100	-	-	-	12	-	-	-	250	-	-	-	-	-
13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
16	-	-	50	-	-	-	-	-	100	-	500	-	-	-	-	-

Line Item No.	Estimated Generated Waste															
	Solid														Liquid	
	Steel/ Iron (kg)	Disposal Status	Copper (kg)	Disposal Status	Wool (kg)	Disposal Status	Batteries (No.)/(kg)	Disposal Status	Plastic, Wood, Cloth & Packaging (kg)	Disposal Status	Electronics (kg)	Disposal Status	Soot (kg)	Disposal Status	Oil (liters)	Disposal Status
17	800	-	50	-	-	-	-	-	50	-	-	-	-	-	-	-
18	300	-	-	-	-	-	-	-	50	-	-	-	-	-	-	-
19	10,000	-	500	-	-	-	-	-	100	-	-	-	-	-	-	-
20	4,500	-	100	-	-	-	-	-	100	-	-	-	-	-	-	-
21	200	-	-	-	-	-	-	-	50	-	-	-	-	-	-	-
22	800	-	-	-	-	-	-	-	50	-	-	-	-	-	-	-
23	170,000	-	-	-	-	-	-	-	800	-	-	-	3000	-	-	-
24	100	-	-	-	-	-	-	-	50	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	2,000	-	50	-	-	-	-	-	50	-	-	-	-	-	-	-
27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	10,000	-	100	-	-	-	-	-	100	-	-	-	-	-	-	-
30	100	-	10	-	-	-	-	-	50	-	-	-	-	-	-	-
31	1,000	-	50	-	-	-	-	-	50	-	-	-	-	-	-	-
32	2,500	-	500	-	-	-	-	-	100	-	-	-	-	-	-	-
33	20	-	300	-	-	-	-	-	100	-	1,000	-	-	-	-	-

Appendix A: Photographs



Photograph 01: New equipment were not properly placed and marked at units 1, 2, 3



Photograph 02: Iron and wood waste observed outside storage yard at unit 4



Photograph 03: New Equipment were not properly marked at unit 4



Photograph 04: Oil spill/leakage observed at storage yard unit 1, 2 and 3

Appendix B: Reference Documents

See following pages:

Appendix B1: Environmental Report by Plant EMMP Implimentation Team (ET) of
MTPS²

(see folloowing pages)

² Title page of the report is attached with report, while hard copy of the complete report is handed over to AEAI



NORTHERN POWER GENERATION COMPANY LIMITED

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No. CEO/MZG/Dir (MMS)/10668-71

Head of Project Implementation Unit,
USAID GTIP Project,
AEAI, Islamabad.

Office Of The
Chief Executive Officer
Genco-III, NPGCL, TPS,
Muzaffargarh

Dated. 26/09/2013

Subject: **IMPLEMENTATION OF ENVIRONMENTAL MITIGATION & MONITORING PLAN (EMMP) FOR REPAIR AND REHABILITATION WORK AT MUZAFFARGARH THERMAL POWER STATION.**

It is hereby intimated please that, as per Waste Disposal Plan, proper Handling/Storage of equipment and consequent waste produced hereafter installation, is being ensured.

Further Block wise progress report for the period from July-2013 to September 2013, on the prescribed proforma, by collecting all data relating to procurement/installation and consequent waste generation, as instructed in the EMMP Plan is prepared and is hereby being attached for your information as desired please.

DA/Progress Report

C.C To:

- Mr. Asif Majeed, Project Monitoring and Implementation Engineer USAID Energy Policy Program, AEAI, House-No. 4 Street No. 88, G-6/3, Islamabad.
- PA to CEO TPS Muzaffargarh.

Am. b. A. / 26/09/13
Chief Engineer/Technical Director
NPGCL, TPS Muzaffargarh
26/09/13

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