



**PERFORMANCE AUDIT REPORT
ON
ALLAI KHWAR HYDROPOWER
PROJECT BESHAM
2016-17**

AUDITOR-GENERAL OF PAKISTAN

PREFACE

The Auditor-General conducts audits subject to Articles 169 and 170 of the Constitution of the Islamic Republic of Pakistan 1973, read with Sections 8 and 12 of the Auditor-General's (Functions, Powers, Terms and Conditions of Service) Ordinance 2001. The performance audit of Allai Khwar Hydropower Project Besham was carried out accordingly.

The Directorate General of Audit WAPDA conducted performance audit of Allai Khwar Hydropower Project Besham during February, 2016 for the period from July, 2003 to June, 2015 with a view to reporting significant findings to the relevant stakeholders. Audit examined the economy, efficiency and effectiveness aspects of the Allai Khwar Hydropower Project Besham. In addition, Audit also assessed, on test check basis whether the management complied with applicable laws, rules and regulations in managing the Allai Khwar Hydropower Project Besham. The Performance Audit Report indicates specific actions that, if taken, will help the management realize the objectives of the Allai Khwar Hydropower Project Besham. Most of the observations included in this report have been finalized in the light of discussions in the DAC meeting.

The Audit Report is submitted to the President in pursuance of the Article 171 of the Constitution of the Islamic Republic of Pakistan 1973, for causing it to be laid before both houses of Majlis-e-Shoora [Parliament].

Dated: 22 MAY 2017

Sd/-
(Imran Iqbal)
Acting Auditor-General of Pakistan

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ABBREVIATIONS AND ACRONYMS

AKHP	Allai Khwar Hydropower Project, Besham
CER	Certified Emission Reduction
CFE	Cash Foreign Exchange (from PSDP into Dollar)
CDM	Clean Development Mechanism
C&HS	Civil & Hydraulic Steel
DAC	Departmental Accounts Committee
DEC	Donfang Electric Corporation, China.
ECNEC	Executive Committee of National Economic Council
E&M	Electrical & Mechanical
FATA	Federally Administered Tribal Areas
EoT	Extension of Time
FEC	Foreign Exchange Component (Dollar to Dollar)
GoP	Government of Pakistan
HHC	High-Head Hydropower Consultants
HHP	High-Head Hydropower Project
IDB	Islamic Development Bank
IKZ	Indus Kohistan Seismic Zone
INTOSAI	International Organization of Supreme Audit Institutions
IPC	Interim Payment Certificate
JV	Joint Venture
MoU	Memorandum of Understanding
MoWP	Ministry of Water & Power (Government of Pakistan)
MPR	Monthly Progress Report
MW	Mega Watt
PC-I	Planning Commission-I
PD	Project Director
PEPA	Pakistan Enhanced Partnership Agreement
USD	US Dollar
WAPDA	Water and Power Development Authority

EXECUTIVE SUMMARY

Allai Khwar Hydropower Project (AKHP), Besham was planned to be constructed on the Allai Khwar (Allai Nullah), a left bank tributary of River Indus located near Besham town in the Battagram district of Khyber Pakhtunkhwa (KPK) Province. It is 265 km Islamabad on the famous Silk Route, the Karakorum Highway. This Project is a part of WAPDA Vision-2025 Program. As per design, the proposed gross head of the project was 697 m high and storage capacity was 1.85 hm³ of water. Hydro Power Potential for the project was 121 MW. The original PC-I of the project was approved by the Executive Committee of National Economic Council (ECNEC) on September 2, 2002 with a total cost of Rs.8,577.82 million and the same was revised on September, 2009 with total revised cost of Rs.13,834.95 million. The management submitted 2nd Revised PC-I for Rs.17,216.41 million in April, 2015 to ECNEC for approval which was awaited till finalization of the report. The project has been completed and its commercial operation has been started in March, 2013.

Directorate General Audit WAPDA conducted performance audit of Allai Khwar Hydropower Project in February, 2016. The main objectives of the audit were to evaluate the economy, efficiency and effectiveness of the project. The audit was conducted in accordance with the prevailing rules and regulations.

a. Key Audit Findings

Following are the key Audit findings:-

- Irregular expenditure incurred beyond the PC-I provisions - Rs.3,806.29 million
- Loss of Rs.1,161.82 million due to non-availing of opportunity of CDM income
- Loss of interest income of Rs.45.92 million due to unjustified grant of interest free financial assistance to the Contractor
- Irregular excessive variation orders amounting to Rs.3,320.50 million for execution of Civil and E&M works
- Un-authentic payment of Rs.2,050 million on account of final settlement claim

- Non-recovery of LD charges of Rs.8 million from the Contractor due to delay in completion of work
- Irregular / unjustified acceleration payment of Rs.171.83 million to the Contractor
- Non-recovery EoT cost claim of Rs.93.70 million from the Contractor
- Irregular expenditure of Rs.42.36 million due to unjustified extension in consultancy period
- Non-recovery of unspent balance of Rs.12.85 million from District Officer Revenue Battagram
- Loss of generation revenue of Rs.13,750.16 million due to time over-run
- Unjustified payment on account of EoT claim of Rs.30.25 million
- Loss due to non-observance of seismicity aspects of the project – Rs.385.06 million

b. Recommendations

In view of the audit findings and the conclusion, following steps / suggestions are recommended with reference to the Allai Khwar Hydropower Project:-

- WAPDA should conduct an inquiry at appropriate level to fix responsibility by ascertaining the real causes of delay in the viable Allai Khwar Hydropower Project.
- Proper surveys / investigations are required to be ensured for any hydropower project to avoid subsequent diversion / detractions in the works entailing extra project cost
- WAPDA's interests should be kept intact while entering into any contract, thereby ensuring insertion of clauses, besides LD clause, for making the Contractor /supplier liable for the loss occurred due to his fault
- WAPDA should ensure capitalization of the opportunity of Clean Development Mechanism (CDM) income upon all the hydropower projects

- WAPDA should rely on its in-house capacity / capability of managerial and engineering services rather than outsourcing the same through hiring of Advisors/consultants
- WAPDA should not give extra contractual financial assistance to the contractors, and if given for any reason the interest thereupon may be charged at the rate being charged to WAPDA against any loan under utilization
- WAPDA should ensure preparation of realistic estimates for PC-1 and discourage issuance of subsequent variation orders

1. INTRODUCTION

Allai Khwar Hydropower Project (AKHP), Besham was planned to be constructed on the Allai Khwar (Allai Nullah), a left bank tributary of River Indus located near Besham town in the Battagram District of Khyber Pakhtunkhwa Province. It is 265 km from Islamabad on the famous Silk Route: the Karakorum Highway. This Project is a part of WAPDA Vision-2025 Program. The proposed gross head is 697 m high and storage capacity 1.85 hm³ of water. Hydro Power potential for the project was 121 MW. The PC-I of the Project was approved by the Executive Committee of National Economic Council (ECNEC) in September, 2002 with a total cost of Rs.8,577.82 million and the same was revised in September, 2009 with total cost of Rs.13,834.95 million. The 2nd revised PC-1 for Rs.17,216.41 million was submitted in April,2015 for approval by ECNEC, which was awaited till finalization of the report.

1.1 Objectives of the Project

Following were the objectives of the project:

- Generation of 463 GWh electricity with installed capacity of 121MW
- Addition of low-cost electricity in the national grid system
- Saving of foreign exchange otherwise spent on import of fuel for thermal power generation
- Saving the environment from effects of oxides of Carbon and Sulphur
- Employment opportunities during construction and operations & maintenance
- Socio-economic uplift of the area.
- Minimizing production cost of Electricity.

1.2 Beneficiaries

Local community
People of Pakistan

1.3 Time Phasing

Construction period including detailed engineering design was 48 months.

1.4 Capital Cost Approved by ECNEC

Original Rs.8,577.82 million (Sep 2002)
1st Revised Rs.13,834.95 million (July 2011)
2nd Revised Rs.17,216.41 million (to be approved)

1.5 Source of Finance

Government of Pakistan (GoP) through PSDP Budget
Islamic Development Bank (IDB) through Loan under ISTASNA Agreement.

1.6 Type of Finance

(Rs. in million)

PC-I	Local	Foreign	Total
PC-I (Original)	5,124.28	3,454.54	8,577.82
PC-I (1 st Revised)	7,312.69	6,522.26	13,834.95
PC-I (2 nd Revised) Proposed	8,795.59	8,420.83	17,216.42
Actual Expenditure on 06/2015	8,372.85	7,658.04	16,030.89

2. AUDIT OBJECTIVES

The main audit objectives of the project were:

- To evaluate whether the project succeeded in achieving objectives as seen in PC-I
- To evaluate whether the internal controls were operative and functioning effectively.
- To examine whether the awarding and execution of contracts were on merit and successful.
- To see whether the payments to the consultants were made in accordance with the provisions of the agreements and the consultants fulfilled their obligations successfully.
- To evaluate cost and time over run
- To evaluate issues regarding the economy and efficiency in completion and operation of the project.

- To assess the effectiveness of project in terms of envisaged benefits.

3. AUDIT SCOPE AND METHODOLOGY

3.1 Audit Scope

Audit period to be covered for this performance audit was from July, 2003 to June, 2015. During this period an expenditure of Rs.16,030.89 million had been incurred. Auditable record of the project was available in the office of the General Manager Projects (Northern Areas), GBHP Colony, Hattian and Chief Engineer (O&M), Allai Khwar Hydropower Project, Besham.

3.2 Audit Methodology

Audit activity started with preparation of documents like detailed Preliminary Survey Report (PSR), audit plan and development of Audit program. Following audit methodology was adopted during the course of performance audit:

- a) Site visits of Power House and Weir
- b) Interview and discussion with Project Management and
- c) Examination of selected record/documents of the project on sample basis

4. AUDIT FINDINGS AND RECOMMENDATIONS

4.1 Organization and Management

4.1.1 Irregular expenditure on account of remuneration to the Advisor in violation of PC-I – Rs.4.55 million

As per Clause 13.2 of PC-I of Allai Khwar Hydropower Project, “there was no provision of the post of Advisor”.

During Performance Audit of Allai Khwar Hydropower Project, Besham it was noticed that an ex-General Manager Projects (Northern Areas), Brig. (R) Engineer Muhammad Zareen was re-employed on contract basis as Advisor to the Authority on Northern Areas projects w.e.f. December 20, 2009 to exercise administrative/financial powers of the G.M Projects (Northern Areas). Later on, the Advisor was relieved of his duties upon posting of the regular G.M Projects (NA) on March, 31, 2014 but he continued his working parallel to G.M Projects

(NA) up to June 30, 2016. Since, there was no provision of the post of Advisor in PC-I, hence expenditure of Rs.4.55 million incurred on account of remuneration of the Advisor was irregular.

Violation of PC-I resulted in irregular expenditure of Rs.4.55 million on account of remuneration to the Advisor.

The matter was taken up with the management in February, 2016, and reported to the Ministry in April, 2016. The management replied that it was prerogative of Authority to employ suitable persons as considered necessary in the interest of work. As the advisor had not attained the age of superannuation, therefore he exercised the financial and administrative powers till the date of his superannuation. Afterwards, regular General Manager exercised the said powers.

The reply was not tenable as appointment of advisor was irregular as no such provision existed in the PC-I. Moreover, a retired person re-hired on contract basis as advisor could not be delegated with administrative and financial powers of GM.

The DAC in its meeting held on December 15, 2016 DAC directed the management to get verified the record in support of reply from Audit. Further progress was not reported till finalization of the report.

Audit recommends that the management needs to investigate the matter for fixing responsibility besides justifying irregular appointment of advisor.

4.1.2 Loss due to non-availing of opportunity of CDM income - Rs.1,161.82 million

According to Clause 11.1.1.2 of 1st revised PC-I, “the Clean Development Mechanism (CDM) income was considered as opportunity of financing through sale of Certified Emission Reduction (CER) to bring Rs.193.64 million annually as additional funding to the project”.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was noticed that the management did not adhere to the subject clause of revised PC-1, thereby losing opportunity of earning substantial amount of CDM income. Resultantly, the National Exchequer had to sustain a loss of Rs.1,161.82 million during a period of six years ($193.638 \times 6 = 1,161.82$ million).

Non-adherence to 1st revised PC-I resulted in loss of Rs.1,161.82 million due to non-availing of opportunity of CDM income.

The matter was taken up with the management in February 2016, and reported to the Ministry in April, 2016. The management replied that all out efforts were utilized to earn CDM Revenue but these efforts went all in vain. Further progress was not reported till finalization of the report.

The DAC in its meeting held on December 15, 2016 directed the management to get verification of record / documents substantiating the efforts made for availing opportunity of CDM income.

Audit recommends that the management needs to investigate the matter for fixing responsibility regarding losing the opportunity of earning substantial amount of CDM income.

4.2 Financial Management

4.2.1 Irregular expenditure in excess of the provisions of PC-I - Rs.3,381.46 million

According to revised PC-I, “the cost of Allai Khwar Hydropower Project was Rs.13,834.95 million.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was noticed that the original PC-I at a cost of Rs.8,577.82 million was approved by ECNEC. Later on, it was revised at a cost of Rs.13,834.95 million. However, the project cost had been increased to the tune of Rs.17,216.41 million from the revised PC-I cost.

Violation of revised PC-I resulted in irregular expenditure of Rs.3,381.46 million.

The matter was taken up with the management in February 2016, and reported to the Ministry in April, 2016. The management replied that the cost of second revised PC-I was increased due to floods, massive slope failure at Power House, blockage of access to site, change in design and Pak rupee depreciation. However, the 2nd revised PC-I was under approval.

The reply was not acceptable as the matter should have been investigated for fixing responsibility regarding massive slope failure, blockage of access to site and change in design.

The DAC in its meeting held on December 15, 2016 directed the management to provide 2nd revised PC-I to Audit on its approval.

Audit recommends that the management needs to investigate the matter for fixing responsibility regarding incurrence of expenditure beyond the PC-I provision without approval from competent forum.

4.2.2 Loss of interest income due to unjustified grant of interest free financial assistance to the Contractor - Rs.45.92 million

As per the contract agreement with M/s DEC, there was no any provision regarding interest free financial assistance to the Contractor.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was observed that financial assistance of Rs.270.07 million was provided to the Contractor M/s DEC without contractual provision. Moreover, no interest was charged from the Contractor on account of financial assistance. Resultantly, Authority sustained a loss of Rs.45.92 million due to deprivation of interest income.

Violation of the Contract agreement resulted in loss of interest income of Rs.45.92 million due to unjustified grant of interest free financial assistance to the Contractor.

The matter was taken up with the management in February 2016, and reported to the Ministry in April, 2016. The management replied that due to hardship being faced by the Contractor, an Amount of Rs.270.07 million was paid to the Contractor out of total approved Rs.394.20 million in anticipation of determination of EoT cost claim which was under review with the Consultant for approval of the competent authority. Further progress was not reported till finalization of the report.

The DAC in its meeting held on December 15, 2016 directed the management to provide relevant record to Audit for verification.

Audit recommends that the management needs to investigate the matter for fixing responsibility besides making the loss good.

4.2.3 Irregular consultancy expenditure in excess of the provision of revised PC-I - Rs.420.28 million

According to revised PC-I, there was provision of Rs.264.42 million on account of consultancy charges.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was observed that an amount of Rs.684.70 million was paid to the consultant

on account of consultancy charges as against the provision of Rs.264.42 million. Thus an amount of Rs.420.28 million was paid in excess of the provision of revised PC-I, which was irregular.

Violation of revised PC-I resulted in irregular consultancy expenditure of Rs.420.28 million.

The matter was taken up with the management in February 2016, and reported to the Ministry in April, 2016. The management replied that excess expenditure was mainly due to dollar impact on payment to foreign consultants and extension of consultancy services upto March 2017 till Defect Liability Period of Duber Khwar Project, as the Consultants were hired for execution of three Hydro Power Projects. The approval of ECNEC was still awaited and 2nd revised PC-I would be provided upon its approval. Further progress was not reported till finalization of the report.

The DAC in its meeting held on December 15, 2016 directed the management to provide 2nd revised PC-I to Audit on its approval.

Audit recommends investigation of the matter for fixing responsibility regarding incurrence of expenditure in excess of PC-I provisions.

4.3 Procurement and Contract Management

4.3.1 Irregular excessive variation orders for execution of Civil and E&M works - Rs.3,320.50 million

According to Sub Clause 2.1 (b)(vi)-Appendix -A to tender Special Stipulations, for contract of Civil & Hydraulic Steel Works, “the Engineer has authority to issue variations up to twenty (20) million per variation and up to one hundred (100) million for all variation orders”. And according to Sub Clause 2.1 (i)(ii) of Conditions of Contract, Schedule A of the tender (Attachment 1) for contract of Electrical & Mechanical Works, “the Engineer has authority to issue variations without the Employer’s approval, up to USD 50,000 per variation and up to USD 01 million for all variations or five percent (5%) of the contract price whichever is less”.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was observed that two contracts namely AC-03 and AE-06 for execution of Civil and E&M works were awarded to M/s Dongfang Electric Corporation (DEC) China, and M/s AV Tech Hydro GmbH, Austria, at the contract price of

Rs.2,163.53 million and Rs.1,505.76 million respectively. Against the said two contracts, variation orders worth Rs.3,320.50 million were issued in excess from the prescribed provisions of contract agreements, which resulted in irregular expenditure of Rs.3,320.50 million.

Non-adherence to the contract agreements resulted in irregular excessive variation orders of Rs.3, 320.50 million issued by the Consultant for execution of Civil and E&M works.

The matter was taken up with the management in February 2016 and reported to the Ministry in April, 2016. The management replied that all variation orders were issued under the Contract No.AC-06 and AC-03 in accordance with the contractual provisions and with the approval of Authority.

The reply and partial record of Rs.656.50 million were examined and Audit held that price adjustment of Rs.153 million, on account of procurement of construction machinery, was irregularly allowed in V.O. AC-03/01 as price adjustment was only admissible for the cost of the material to be consumed in construction of power house. Moreover, the VO AC-03/03 against land sliding was not admissible as the work was insured and the loss was to be recovered from insurance company by the Contractor, instead of employer (WAPDA).

The DAC in its meeting held on December 15, 2016 directed the management to attend further Audit remarks on priority basis. Further progress was not reported till finalization of the report.

Audit recommends that the management needs to investigate the matter for fixing responsibility besides recovering the excessive expenditure from the Contractor.

4.3.2 Un-authentic payment on account of final settlement claim – Rs.2,050 million

According to Clause-58.3 of the Contract Agreement, “the Contractor shall produce to the Engineer all quotations, invoices, vouchers and accounts or receipts in connection with expenditure in respect of provisional sums, except where work is valued in accordance with rates or prices set out in the tender”.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was observed that against total claims of Pak Rs.5,856.40 million, an amount of Rs.2,050 million was allowed to be paid to M/s Dongfang Electric

Corporation (DEC) as final claim/dispute settlement under Memorandum of Understanding-2 (MoU-2). Detail of the claims were not forthcoming from the record, against which the payment of Rs.2,050 was granted to the Contractor. In the absence of such record, the authentication of payment could not be verified.

Non-adherence to the Contract Agreement resulted in un-authentic payment of Rs.2,050 million on account of final settlement claim.

The matter was taken up with the management in February 2016 and reported to the Ministry in April, 2016. The management replied that out of Rs.5,854.40 million an amount of Rs.2,050 million was approved by the Authority, thus saving of Rs.3,806 million was made.

The reply and record were examined and Audit held that the Contractor's insurance claim of Rs.88.32 million was recoverable from insurance company rather than from WAPDA. Acceptance of the Contractor's claims of Rs.7.53 million on account of construction difficulties and Rs.220.56 million of camp facilities were unjustified being Contractor's own responsibility. Payment of price adjustment of Rs.167.88 million was also not admissible as it was to be paid under respective contractual provisions. Responsibility needed to be fixed upon the officers responsible for delay in issuance of construction order caused payment of Rs.112.35 million EoT cost. Inclusion of previously certified claims in the Global claim settlement and payment of interest on delayed release of retention money without engineer's decision was inadmissible. Income tax on additional EoT cost Rs.22.32 million was not admissible being remitted to the income tax authorities. Authenticity of additional cost of EoT No. 3 could not be ascertained as complete record was not provided. Therefore, authenticity and genuineness of Rs.2,050 million could not be ascertained as all necessary correspondence of Global claim settlement was not provided.

The DAC in its meeting held on December 15, 2016 DAC directed the management to attend further audit remarks on priority basis. Further progress was not reported till finalization of the report.

Audit recommends that the management needs to investigate the matter for fixing responsibility regarding payment made to the Contractor before finalization of Global settlement.

4.3.3 Non-recovery of LD charges from the Contractor - Rs.8 million

According to MoU-2 Clause-12, “delay penalties to the amount of Rs.0.25 million per calendar day and milestone for which a separate date for completion stands agreed, shall be applied/deducted from any monies to become due and payable to the Contractor. The total amount of delay penalties shall be limited to Rs.80 million.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was observed that 1177 days extension in time was granted to M/s DEC for completion work up to May 05, 2012. The Contractor could not complete the work within stipulated period. An amount of Rs.80 million of LD charges for 355 days was required to be recovered from the Contractor. Accordingly out of Rs.80 million, an amount of Rs.72 million was recovered from the Contractor and got verified by Audit. The remaining amount of Rs.8 million was still to be recovered from the Contractor.

Non-adherence to the Contract Agreement resulted in non-recovery of LD charges of Rs.8 million from the Contractor.

The matter was taken up with the management in February 2016 and reported to the Ministry in April, 2016. The management replied that delay penalties and LDs of remaining Rs.8 million would be made from remaining claims and retention money of the Contractor. Further progress was not reported till finalization of the report.

The DAC in its meeting held on December 15, 2016 directed the management to recover remaining amount of Rs.8 million from the Contractor and get the recovery record verified from Audit.

Audit recommends that the management should pursue the balance recovery of LD from the Contractor vigorously.

4.3.4 Irregular / unjustified acceleration payment to the Contractor - Rs.171.83 million

As per the contract agreement of (AE-06) for E&M, there was no any provision regarding acceleration payment to the Contractor.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was noticed that an amount of Rs.171.83 million (USD 1.72 million) on account of acceleration payment was paid to the Contractor despite the fact that

there was no such provision existed in the contract. Hence, acceleration payment of Rs.171.83 million to the Contractor was unjustified, being extra-contractual, and required to be recovered.

Violation of Contract Agreement resulted in irregular / unjustified acceleration payment of Rs.171.83 million to the Contractor.

The matter was taken up with the management in February 2016 and reported to the Ministry in April, 2016. The management replied that the incentive payments were made to the Contractor upon early achievement of the project completion. During intervening period of actual completion and contractual completion, WAPDA generated 296.029(M) KWH of electricity and thus earned revenue worth Rs.2,960.29 million @ Rs.10 per KWH.

The reply was not tenable as no documentary evidence was provided.

The DAC in its meeting held on December 15, 2016 directed the management to get verified their position with documentary evidence from Audit. Further progress was not reported till finalization of the report.

Audit recommends that the management needs to investigate the matter for fixing responsibility regarding acceleration payment to Contractor beyond contractual provisions.

4.3.5 Non-recovery of EoT cost claim from the Contractor - Rs.93.70 million

According to the Contract Agreement, there was no provision for indemnification of financial losses occurred due to hampering of work by one contractor causing delay / loss in work of the other contractor.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was noticed that Extension of Time-3 (EoT) for 391 days in completion period was granted to the E&M contractor due to delay in completion of C&HS work by M/s DEC. Resultantly, a sum of Rs.93.70 million (USD 0.94 million) was paid to the Contractor of Lot E&M for the delay caused by M/s DEC. Since, there was no provision existed in contract agreement for payment of financial losses caused by other contractor hence, EoT cost of Rs.93.70 million was unjustified and required to be recovered from the Civil Contractor Lot C&HS, who caused such delay.

Non-adherence to the Contract Agreement resulted in non-recovery of EoT cost claim of Rs.93.70 million from M/s DEC.

The matter was taken up with the management in February 2016 and reported to the Ministry in April, 2016. The management replied that only delay penalties could be recovered from the civil works Contractor as per the provisions of contract instead of other penalties as determined by audit.

The reply was not tenable as the EoT cost was to be recovered from the civil contractor.

The DAC in its meeting held on December 15, 2016 directed the management that the recovery be made good from the Contractor of civil works and get it verified from Audit. Further progress was not reported till finalization of the report.

Audit recommends that the management needs to investigate the matter for fixing responsibility besides recovering the EoT cost payment to the Contractor.

4.3.6 Irregular expenditure due to unjustified extension in consultancy period - Rs.42.36 million

According to ToC, “the AKHP had started its commercial operation in March, 2013 and its Defect Liability Period (DLP) stood expired on January 06, 2016”.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was observed that consultancy agreement of High Head Hydropower Consultant (HHC) was extended under Amendment No.02 with additional remunerations, direct cost and contingencies for escalations. After expiry of Defect Liability Period (DLP) there was no justification of extension in consultancy period up to March, 2017 as the Power Station had started its operation since March, 2013. Hence, payment of consultancy charges of Rs.42.36 million (93.806 / 31 months x 14 months) was irregular.

Project mismanagement resulted in irregular expenditure of Rs.42.36 million due to unjustified extension in consultancy period.

The matter was taken up with the management in February, 2016 and reported to the Ministry in April, 2016. The management replied that the Consultants had been hired for three Hydro Power Projects i.e. Allai Khwar

Project, Duber Khwar Project & Khan Khwar Project. As Duber Khwar's Defect Liability Period (DLP) would expire in January, 2017 therefore, at least consultancy agreement would remain active till March, 2017 to finalize the closing of contract activities after issuance of DLP by decreasing the cost of consultancy services accordingly.

The reply was not tenable as the consultancy charges were required to be rationalized and charged proportionately to the Allai Khwar Project to the extent of its defect liability period.

The DAC in its meeting held on December 15, 2016 directed the management to get the record verified by Audit. Further progress was not reported till finalization of the report.

Audit recommends that the management needs to substantiate the fact that the cost of consultancy services to the extent of Allai Khwar Project has not been charged after expiry of its Defect Liability Period.

4.4 Assets Management

4.4.1 Non-demarcation of land - Rs.44.87 million

As per Project Director Allai Khwar Hydropower Project WAPDA, Besham letter dated July 15, 2014, a piece of 1,014.25 kanals of land was acquired but could not be demarcated in favour of the Project.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was observed that an area of 1,014.25 kanals of land valuing Rs.44.87 million was acquired for different components of the project but its demarcation was pending / under process since 2003. Audit held that further delay in this regard would disrupt the process of demarcation at any stage.

Assets mismanagement resulted in non-demarcation of land valuing Rs.44.87 million.

The matter was taken up with the management in February, 2016 and reported to the Ministry in April, 2016. The management replied that demarcation of land was under process with the office of G.M Hydel operation. Further progress was not reported till finalization of the report.

The DAC in its meeting held on December 15, 2016 decided the management to get the record verified from Audit after completion of demarcation process.

Audit recommends that the management needs to pursue the demarcation process of land vigorously.

4.4.2 Non-recovery of unspent balance from District Officer (Revenue) - Rs.12.85 million

According to Section-III (1) of WAPDA Guidelines for Enforcing Responsibility for Losses due to Fraud, Theft or Negligence of Individuals, 1982 (amended up to June 01, 2001), “all losses whether of public money or of store, shall be subjected to preliminary investigation by the officer in whose charge they were, to fix the cause of the loss and the amount involved”.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was observed that an amount of Rs.12.85 million, lying unspent with District Officer, Revenue, was not received back from him since 2004.

Assets mismanagement resulted in non-recovery of unspent balance of Rs.12.85 million from District Officer, Revenue.

The matter was taken up with the management in February 2016 and reported to the Ministry in April, 2016. The management replied that the matter was taken up with District Officer Revenue Batagram for recovery of unspent balance but no response was received.

The DAC in its meeting held on December 15, 2016 directed the management pursue the case with Revenue Authority for recovery of unspent balance.

Audit recommends that the management needs to expedite the efforts for recovery of unspent balance.

4.4.3 Non-supply of spare parts by the Contractor - Rs.301.81 million

According to Para-30.2 of General conditions of the contract agreement, “the contractor shall be responsible for making good any defect in or any damage to any part of the works which may appear or occur during the Defect Liability Period (DLP), the contractor shall make good the defect or damage as soon as practicable and at his own cost”.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was observed that deficient spare parts worth Rs.301.81 million were required to be received back from the contractor.

Non-adherence to the contract agreement resulted in non-supply of spare parts worth Rs.301.81 million by the contractor.

The matter was taken up with the management in February 2016 and reported to the Ministry in April, 2016. The management replied that the deficient spare parts valuing Rs.4.225 million were required to be received back from the Contractor instead of Rs.301.81 million and the matter was being pursued with the Contractor. Further progress was not reported till finalization of the report.

The DAC in its meeting held on December 15, 2016 pended its decision till full supply of deficient spare parts and to get the Stock Measurement Books verified from Audit.

Audit recommends that the management needs to accelerate efforts for recovery of spare parts from the Contractor besides fixing responsibility.

4.5 Monitoring and Evaluation

4.5.1 Loss of generation revenue due to time over-run - Rs.13,750.16 million

According to PC-1, “the targets of revenue from generation of the project was set as Rs.4,629.43 million, which was revised up to Rs.9,120.731 million in 2009”.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was observed that the project was delayed and started its commercial operation in March 2013. As such the target of revenue, envisaged in the PC-1, could not be achieved. Thus, delay in commencement and completion of the valuable project resulted in loss of generation revenue of Rs.13,750.16 million.

Non-adherence to PC-I resulted in loss of generation revenue of Rs.13,750.16 million due to time over-run.

The matter was taken up with the management in February 2016 and reported to the Ministry in April, 2016. The management replied that the Authority had investigated the reasons for cost overrun through high level committee constituted by the Member (Water) and headed by General Manager (M&S) regarding different ongoing projects of WAPDA including Allai Khwar Project. The said committee had declared the cost overrun as justified in the prevailing conditions and circumstances.

The reply was not acceptable as the inquiry needed to be conducted at the Ministry level.

The DAC in its meeting held on December 15, 2016 decided that the Additional Secretary-II would review the inquiry report and offer his comments to proceed further in the matter. Further progress was not reported till finalization of the report.

Audit recommends that the management needs to implement DAC's directives besides fixing responsibility.

4.5.2 Non-saving of foreign exchange - Rs.17,598.70 million

According to PC-I, "saving in foreign exchange by reducing dependence on thermal power option was projected to the tune of Rs.1,176.97 million which was revised upto Rs.3,516.95 million in 2009".

During Performance Audit of Allai Khwar Hydropower Project Besham, it was noticed that the project was delayed and started its commercial operation in March, 2013. As such targets of saving in foreign exchange due to less dependence on thermal generation, as envisaged in PC-1, could not be achieved. Resultantly, delay in commencement and completion of the valuable project resulted in non-saving of foreign exchange of Rs.17,598.70 million.

Non-adherence to PC-I provision resulted in non-saving of foreign exchange of Rs.17,598.70 million.

The matter was taken up with the management in February 2016 and reported to the Ministry in April, 2016. The management replied that the Authority had investigated the reasons for cost overrun through high level committee constituted by the Member (Water) and headed by General Manager (M&S) regarding different ongoing projects of WAPDA including Allai Khwar Project. The said committee had declared the cost overrun as justified in the prevailing conditions and circumstances.

The reply was not acceptable as the inquiry needed to be conducted at Ministry level.

The DAC in its meeting held on December 15, 2016 decided that the Additional Secretary-II would review the inquiry report and offer his comments to proceed further in the matter. Further progress was not reported till finalization of the report.

Audit recommends that the management needs to inquire the matter by constituting third party inquiry committee.

4.5.3 Loss due to dollar rate fluctuation - Rs.553.52 million

According to PC-I, “total cost of the project was estimated as Rs.8,577.82 million (at the rate of Rs.60 per USD) which increased to Rs.17,216.41 million in the 2nd Revised PC-I (2015) duly rationalized at the rate of Rs.101.759 per USD”.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was observed that non-completion of the project within stipulated period resulted in successive revisions of PC-1 cost over a period of more than a decade. This caused loss to the Authority on account of, inter alia, foreign currency exchange rate fluctuation. Audit contended that besides other factors, the avoidable delay in completion of the project gave rise to absorbing the impact of increased US\$ rates, ultimately contributing loss to the Authority to the extent of Rs.553.52 million.

Project mismanagement resulted in loss of Rs.553.52 million due to dollar rate fluctuation.

The matter was taken up with the management in February 2016 and reported to the Ministry in April, 2016.

The matter was taken up with the management in February 2016 and reported to the Ministry in April, 2016. The management replied that the Authority had investigated the reasons for cost overrun through high level committee constituted by the Member (Water) and headed by General Manager (M&S) regarding different ongoing projects of WAPDA including Allai Khwar Project. The said committee had declared the cost overrun as justified in the prevailing conditions and circumstances.

The reply was not acceptable as the inquiry needed to be conducted at Ministry level.

The DAC in its meeting held on December 15, 2016 decided that the Additional Secretary-II would review the inquiry report and offer his comments to proceed further in the matter. Further progress was not reported till finalization of the report.

Audit recommends that the management needs to inquire the matter by constituting third party inquiry committee.

4.5.4 Unjustified payment of EoT claim due to non-construction of access roads – Rs.30.25 million

According to Section-III (1) of WAPDA Guidelines for Enforcing Responsibility for Losses due to Fraud, Theft or Negligence of Individuals, 1982 (amended up to June 01, 2001), “all losses whether of public money or of store, shall be subjected to preliminary investigation by the officer in whose charge they were, to fix the cause of the loss and the amount involved”.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was observed that EoT claim of Rs.30.25 million was sanctioned on the grounds that the construction order was issued with substantial delay of 562 days.

Audit contended that construction order was issued on June 23, 2003 to M/s DEC whereas contracts for access roads were awarded in August 2003 i.e. two months later than the award of contract to M/s DEC with completion date of February, 2004. Question arose as to why the management decided to award the contract to M/s DEC prematurely when no access roads were yet present to mobilize the Contractor to the site. In addition to that, it was also unjustified to accept the office overheads at much higher rates i.e. 5%.

Project mismanagement resulted in loss due to unjustified payment of EoT claim of Rs.30.25 million upon non-construction of access roads.

The matter was taken up with the management in February 2016 and reported to the Ministry in April, 2016. The management replied that the PC-1 cost had overrun due to various delaying reasons such as provision of excess roads, earthquake of October 2005, adverse law & order situation in the FATA and project area, terrorism threats, and devastating floods of July 2010. Authority had investigated the reasons for cost overrun through high level committee headed by General Manager (M&S) regarding different ongoing projects of WAPDA including Allai Khwar Project.

The reply was not acceptable as the construction of access roads was the responsibility of the Employer and non-construction of the same caused EoT to the Contractor causing unjustified payment of Rs.30.25 million.

The DAC in its meeting held on December 15, 2016 directed the management to provide time line for the construction of project along with documentary evidence and calculations to Audit. Further progress was not reported till finalization of the report.

Audit recommends that the management needs to investigate the matter for fixing responsibility regarding non-construction of access roads causing unjustified payment of EoT claim.

4.5.5 Loss due to non-observance of seismic aspects of the project – Rs.385.06 million

According to Para-6 of Chief Engineer Advisor (CEA) UO No.HP-5(123)/2002 dated February 08, 2002, “the detailed seismic risk evaluation was recommended to derive a realistic maximum design earthquake and other related parameters and the basis of seismic risk evaluation was required to be cross checked by an independent expert”. And According to Para No.5 of Chief Engineer Advisor (CEA) UO No.HP-5(121)/2002 dated October 29, 2009, “after October, 2005 earthquake, the seismicity aspect of the project components were not analyzed in detail. The same was required to be analyzed in making provision in the revised PC-I”.

During Performance Audit of Allai Khwar Hydropower Project Besham, it was observed that the site for construction of the project was selected in the Indus Kohistan Seismic Zone (IKSZ) of Khyber Pakhtoonkhwa. Neither detailed risk evaluation report nor any cross checking thereof by any independent expert was forthcoming from the record. Moreover, there occurred earthquake in 2005 and flood in 2010 due to which a loss of Rs.240.127 million on account of construction of back slope of the power house and under- ground effects to the sub-soil, had to be borne by WAPDA. Moreover, a bill of M/s Dongfang Electric Corporation (DEC) China was also approved by the Authority for Rs.144.930 million on account of increased quantities of works at diversion tunnel arising from unfavorable and unforeseeable geological condition. Audit held that the above referred observations of the Chief Engineer Advisor regarding seismicity aspect of the project were not given due consideration. Surveys / investigations were not got conducted properly at the outset of the project situated at a site of peculiar geological condition. Had the proper investigations / precautionary

measures been made in time, the loss of Rs.385.06 million (Rs.240.13 million + Rs.144.93 million) could have been avoided or at least minimized.

Project mismanagement resulted in loss of Rs.385.06 million due to non-observance of seismicity aspects of the project.

The matter was taken up with the management in February 2016 and reported to the Ministry in April, 2016. The management replied that adequate Geological Investigation had not been carried out by M/s GTZ before the preparation of Tender Documents by them which resulted in addition / varied works during the execution of the Project.

The reply and record produced thereof was examined and Audit held that the approval of the contractor's claim of Rs.144.93 million, on the basis of unfavorable and unforeseeable geological conditions encountered at diversion tunnel, was unjustified as it was the responsibility of contractor being familiar with all site conditions at the time of submission of his bid. Moreover, payment of Rs.240.13 million on account of additional slope stabilization / rectification measures due to flood damages at the back slope of power house was unjustified as the work was insured. Hence, cost of Rs.240.13 million was to be borne by the contractor instead of WAPDA.

The DAC in its meeting held on December 15, 2016 directed the management to attend further audit remarks on priority basis. Further progress was not reported till finalization of the report.

Audit recommends that the management needs to investigate the matter for fixing responsibility besides recovering the cost of insured work from concerned insurance company.

4.6. Overall Assessment

Overall assessment of the performance of project with reference to three "Es" i.e. Economy, Efficiency and Effectiveness is as under:-

4.6.1 Economy

The economy aspect of the project was effected to the extent that the project was delayed for almost 6 years due to which the project cost raised from Rs.8,577.82 million to Rs.17,216.41 million, thereby putting loss of Rs.8,638.58 million as on June 30, 2015. However, on its completion per unit cost of the running project was 241 paisa/Kwh in 2013-14 and 239 paisa/Kwh in 2014-15 as

against the projected per unit cost of Rs.3.50/ Kwh, so the project proved to be economically viable. Had this viable project been completed within the stipulated period of four (4) years, the said loss on account of project cost as well as the prospective cheap hydropower could have been avoided.

4.6.2 Efficiency

The dismal performance of the project management with reference to efficiency could be gauged from the following factors:-

- The project was scheduled to be completed within stipulated period of four (4) years but it took ten (10) years for its completion
- Proper surveys/investigations were not made at the outset of the project that caused subsequent diversions/variations resulting in substantial delay in works and increase in project cost
- Due to delay in completion of the project, WAPDA was deprived of the benefits on account of revenue generation of Rs.13,750.16 million and saving of Rs.17,598.70 million in foreign exchange by reducing dependence on thermal power option, as envisaged in PC-1
- The pre requisite completion of access roads, obligatory upon the Employer, was considerably delayed for a period of more than two (2) years that contributed a lot in delay of the project.

4.6.3 Effectiveness

The effectiveness of the project due to its affordable low per unit cost and environment friendly nature can well be assessed from the following benefits attributed to the project:-

- Per annum revenue will be on higher side in the context of increasing trend in the tariffs of electricity.
- The project, rather completed late has contributed in reducing dependence on thermal power option to be incurred otherwise on fuel would save foreign exchange amounting to Rs.1,740.88 million in five years of time

- It has added to social up-lift & employment opportunities for the local peoples
- It has minimized the Carbon Dioxide and Sulphur Dioxide effects
- It has added cheaper hydro potential in the National grid.

5. CONCLUSION

Allai Khwar Hydropower Project, Besham was approved under the WAPDA's vision 2025 program of Water Resources and Hydro Power Development. The project management could not manage and closely monitor all the activities timely resultantly envisaged benefits as per PC-I Proforma could not be achieved well in time for more than six (6) years and were delayed accordingly due to the cost increased by Rs.17,216.41 million against the original PC-I cost of Rs.8,577.82 due to following factors:-

- Selection of site for construction of powerhouse in highly seismic & geological risky area
- Non-conducting a special study regarding seismic & geological effects
- Selection of site for power house is too near the hilly slope of unreliable rocks with almost 60 to 80 degree
- Delay in construction of access roads for mobilization of the Contractor to site
- Delay in commencement of work by the Contractor i.e. M/s DEC for Civil & Hydraulic Steel (C&HS)
- Slow / poor progress of works by the Contractor due to lack of supervision by the Client as well as the Engineer
- Change in design of tunnel
- Weak financial position of the Contractor that caused financial assistance for completion of project but even then the works could not be completed within the scheduled time
- Neither provisions of PC-I nor that of contract were followed in letter and spirit
- Extension of Time (EoT) was granted frequently to the Contractors, specially to M/s DEC ,engaged for civil works ,the

delay of which also caused delay in E&M works

- Parallel engagement of M/s DEC at the Allai Khwar Hydropower Project and Jinnah Hydropower Project, Mianwali, thereby diverting the attention that affected the works.

6. RECOMMENDATIONS

In view of the audit findings and the conclusion following steps / suggestions are recommended with reference to the Allai Khwar Hydropower Project:-

- WAPDA should conduct an enquiry at appropriate level to fix responsibility by ascertaining the real causes of delay in the viable Allai Khwar Hydropower Project.
- Proper surveys/investigations are required to be ensured for any hydropower project to avoid subsequent diversion/detractions in the works entailing extra project cost
- WAPDA's interests should be kept intact while entering into any contract, thereby ensuring insertion of clauses, besides LD clause, for making the Contractor / supplier liable for the loss occurred due to his fault
- WAPDA should ensure capitalization of the opportunity of Clean Development Mechanism (CDM) income upon all the hydropower projects and fix responsibility for non-pursuance in case of Allai Hydropower Project, thereby losing opportunity of CDM income of Rs.1,161.82 million, despite its provision in the PC-I
- WAPDA should rely on its in-house capacity/capability of managerial and engineering services rather than outsourcing the same through hiring of Advisors/consultants
- WAPDA should not give extra contractual financial assistance to the Contractors, and if given for any reason the interest thereupon may be charged at the rate being charged to WAPDA against any loan under utilization

- WADA should ensure preparation of realistic estimates for PC-1 and discourage issuance of subsequent variation orders as much as possible that also cause delay as well as cost escalation of the project
- WAPDA's interests should be protected while signing any Memorandum of Understanding during currency of the contractual works
- The project management should ensure completion of remedial works lying pending even after commercial operation and Defect Liability Period

ACKNOWLEDGEMENT

We wish to express our appreciation to the management and staff of Allai Khwar Hydropower Project, Besham for the assistance and cooperation extended to the auditors during this assignment.

PROJECT DIGEST

Name of Project	Allai Khwar Hydropower Project (AKHP)
Location of the Project	Project is located in Besham town at 5 km downstream of Indus River Distt: Battgram
Sponsoring	Ministry of Water and Power (MoWP) through Government of Pakistan (GoP)
Execution	Water and Power Development Authority (WAPDA)
Operation and Maintenance	Water and Power Development Authority (WAPDA)
Project Objectives	The prime objective of the implementation of Allai Khwar Hydropower Project (AKHP) is to provide the cheaper and most needed future power requirements of Pakistan through installation of 2 No. hydroelectric Pelton generating units of 121 MW with annual energy of about 463 GWh.
Approval by ECNEC	PC-I (Original) approved on 02.09.2002 PC-I (1 st Revised) approved on 02.09.2009 PC-I (2 nd Revised) Proposal was submitted for approval of ECNEC in April, 2015 which is not yet approved.
Project Completion	The Project was required to be completed within a period of 48 months after award of contract in June, 2003. However, commercial operation was started in March, 2013

Approved Cost (in million)	Local Costs	Foreign Exchange	Total
(Original)	Rs.5,124.28	Rs.3,453.54	Rs.8,577.82
(1 st Revised)	Rs.7,312.69	Rs.6,522.26	Rs.13,834.95
(2 nd revised)	Rs.8,795.58	Rs.8,420.83	Rs.17,216.41

Annual Recurring Expense after completion	Local Costs	Foreign Exchange	Total
	Rs.756.10	Rs.865.64	Rs.1,621.74
Source of Financing	IDB LOAN	PSDP	Total
	(US\$.44.976)		
	Rs.4,011.23	Rs.13,205.10	Rs.17,216.33

(As Per 2nd Revised proposed PC-I)

Previous approval / anticipatory / German Agency for Technical Cooperation, (GTZ) reviewed the feasibility study prepared by Lahmeyer International, in May, 2000 which was approved by ECNEC on 02.09.2002. The contracts for Civil & Hydraulic Steel and Electrical & Mechanical works were awarded in July, 2002 to be completed tentatively in forty eight (48) months. Project location was feasible for the high head hydropower plants on Run-off River of the tributaries of River Indus ie, Allai Kkwar near Besham in the province Khyber Pakhtoon Khwa

Completion The access roads to the site were not completed in time. Hence, the Construction order to the main contractor was issued in August, 2005. The project became further late due to earth-quake, 2005, Chinese evacuation from the Site due to law & order situation, 2007 and floods, 2010. The Geological conditions were also unfavorable. However, the project started its commercial operation in March, 2013.

*Annexure-2***STATEMENT REGARDING PSDP ALLOCATION & FUNDS
RELEASED/UTILIZED**

Year	(Rs. in million)					
	PSDP Allocation			Amount Released / Utilized		
	Local	FEC	Total	Local	FEC	Total
2001-02	15.54	-	15.54	15.54	-	15.54
2002-03	500.00	500.00	1,000.00	225.86	411.84	637.70
2003-04	1,100.00	700.00	1,800.00	136.31	257.54	393.86
2004-05	340.98	-	340.98	288.37	16.00	304.37
2005-06	700.00	1,000.00	1,700.00	335.99	103.72	439.72
2006-07	1,267.00	600.00	1,867.00	1,040.69	161.48	1,202.18
2007-08	1,000.00	700.00	1,700.00	883.81	168.19	1,052.00
2008-09	1,085.93	1,673.07	2,759.00	756.39	1,071.09	1,827.48
2009-10	1,945.00	1,520.00	3,465.00	589.96	735.97	1,325.93
2010-11	881.82	1,585.00	2,466.82	473.42	1,326.57	1,799.99
2011-12	974.45	1,170.00	2,144.45	521.55	1,555.97	2,077.52
2012-13	804.00	1369.00	2,173.00	164.23	1,140.59	1,304.82
2013-14	1,091.00	132.00-	1,223.00	-	899.56	1,280.17
Total	11,705.72	10,940.07	22,639.26	5,432.14	7,849.53	13,661.28

CHRONOLOGY OF PROJECT HISTORY

- Date of review of feasibility Study by MoWP May, 2000
- Date of approval of PC-I by ECNEC 02.09.2002
- Date of Contract for Lot C&HS signed by M/s DEC 23.06.2003
- Date of Contract for Lot E&M signed by M/s AV Tech 19.06.2003
- Date of completion of access roads 06.08.2005
- Date of issuance of construction order 06.08.2005
- Date of Earthquake, 2005 08.10.2005
- Date of completion of the project (original contract) 22.06.2007
- Date of evacuation of Chinese/contractor from site 07.11.2007
- Date of return of Chinese/contractor 20.02.2008
- Date of devastating flood, 2010 July, 2010
- Date of back slope failure 10/2010, 02/2011 & 03/2011
- Date of signing of Memorandum of Understanding-2 11.10.2012
- Date of start of Defect Liability Period (DLP) 07.01.2013
- Date of inauguration by President of Pakistan 04.03.2013
- Date of anticipated completion 31.03.2013
- Date of commercial operation of unit No.1 25.03.2013
- Date of commercial operation of unit No.2 31.03.2013
- Date of submission of 2nd Revised PC-1 for approval of ECNEC 14.04.2015
- Date of end of Defect Liability Period (DLP) 06.01.2016

**TABLE OF PERFORMANCE AUDIT REPORT ON ALLAI KHWAR
HYDROPOWER PROJECT BESHAM**

TABLE-1*(Rs. in million)*

Description	Unit	Quantity/Amount
Installed Capacity	MW	121
Annual Energy Generation	GWh	463
Annual Certified Emission Reduction (CER)	CO ₂ / year	223,583
Price per CER	USD/CO ₂	12
Annual CDM Revenue (gross)	USD/year	2,682,992
CDM Consultancy, Validation & Verification Cost	USD	350,000
Net Annual CDM Income	USD/year	2,332,992
Net Annual CDM Income @ Rs.83/USD	Rs. 83/ USD	193,638,336
CDM income for 6 years	Rs.	1,161,830,016

Table - 2

Contract No.	Contractor	Contract Amount	No of Variation orders	Limit of variation	Variation Orders' Amount	Remarks
AC-03 (C&HS)	M/s Dongfang Electric Corporation, (DEC), China	2163.53	10	100	2,964.20	Amount of VOs was 137 % of the Contract amount
AE-06 (E&M)	M/s VA Tech Hydro GmbH, Austria	1505.76	06	100	356.30	23 % of the contract price
Total			16		3,320.50	

Table-3

PC-I	Approval date	Period	Revenue projected (Rs in Millions)
PC-I (Original)	November, 2001	2006-07 to 2010-11	4,629.43
PC-I (1 st Revised)	August, 2009	2009-10 to 2013-14	9,120.73
Total			13,750.16

Table-4

PC-I	Approval date	Completion year	Annual Projected Savings	Savings Up to 2013
PC-I (Original)	November, 2001	2006	1,176.97	3,530.91
PC-I (1 st Revised)	August, 2009	2013	3,516.95	14,067.79
			Total	17,598.70

TABLE-5

1. Contract No. AC-03 for Civil & Hydraulic Steel Works	Rs.342.27 million
2. Contract No. AE-06 Electrical & Mechanical Works	<u>Rs.211.25 million</u>
Total	Rs.553.52 million