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Closeout Report

Kandahar Helmand Power Project (KHPP)

COMPONENT 4

TRANSPORTATION, INSTALLATION, OPERATION & MAINTENANCE OF KANDAHAR (SHORANDAM) INDUSTRIAL PARK DIESEL POWER PLANT



Submitted by: Black & Veatch Special Projects Corporation (BVSPC)
Federal Services Division
Kandahar Helmand Power Project (KHPP)
USAID Contract Number 306-C-00-11-00506-00

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U.S. Agency for International Development (USAID)
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Kabul, Afghanistan

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List of Attachments

Document # (if applicable)	Description (Note: The Section references below are the BVSPC-USAID Contract sections wherein specific deliverable requirements are located.)	Status	In Closeout Package?
a-01	Closeout Package Attachment File Directory.	Complete	Yes
a-01	Contract Closeout Procedures Manual (CCPM).	Complete	Yes
a-02	Security Plan [Section F.4.B(A)] - Site Specific.	Complete	Yes
a-03	Implementation Plan - Work Plan (Section F.4.B-B).	Complete	Yes
a-04	Health and Safety Plan and Procedures (Section C.4.6; Section F.4.B-C).	Complete	Yes
a-05	Quality Control Plan (Section C.4.5; Section F.4.B-C).	Complete	Yes
a-06	Warranty Administration Plan (Section C.4.11; FAR 52.246.21).	Complete	Yes
a-07 (a and b)	Project Execution Plan and B&V Construction Processes and Procedures Manual (Section C.4.5).	Complete	Yes
a-08	Construction/Final Schedule (Section C.4.10; Section F.4.B-C) - CLIN Specific.	Complete	Yes
a-09	Photo Album.	Complete	Yes
a-10	Small Business Utilization Subcontracting Plan (Section H.23; Section J - Attachment 19; FAR 52.219-8).	Complete	Yes
a-11	Operations and Maintenance (O&M) Manuals (Section C.4.11; Section F.4.B-C).	Complete	Yes
a-12	Performance Monitoring and Evaluation Plan - each Contract Component as stipulated by COR (Section C.4.13).	Complete	Yes
a-13	Branding Implementation Plan (Section F.4 B,C; Section D.2).	Complete	Yes
a-14	Environmental Plan (Section H.16).	Complete	Yes
a-15	Environmental Compliance Documentation Schedule (Section H.16).	Complete	Yes
a-16	Environmental Closeout Report (Section H.16) - Site Specific.	Complete	Yes
a-17	Environmental Reports (Section F.4.B-C) -- Annual Reports until Modification 10 (16 Feb 2013), and then Quarterly Reports.	Complete	Yes

Document # (if applicable)	Description (Note: The Section references below are the BVSPC-USAID Contract sections wherein specific deliverable requirements are located.)	Status	In Closeout Package?
a-18	Weekly Highlight Report (Section F.4.B-B).	Complete	Yes
a-19	Short-term Report - STTA Trip reports (Section F.4.B-B) - Site Specific.	Not Applicable	N/A
a-20	Design Submittals (Section F.4.B-C) - Site Specific.	Complete	Yes
a-21	Inspection and Equipment Test Reports (Section F.4.B-C) - Site Specific.	Complete	Yes
a-22	Concrete Strength Tests: Steel reinforcements test reports (Section F.4.B-C) - Site Specific.	Complete	Yes
a-23	Testing and Commissioning Report (Section F.4.B-C) - Site Specific.	Complete	Yes
a-24	As-built Construction Drawings (Section C.4.11; Section F.4.B-C) - Site Specific.	Complete	Yes
a-25	Training Reports.	Complete	Yes
a-26	Fuel Injector Failure Report.	Complete	Yes
a-27	Final Closeout Report (Section C.4.11; Section F.4.B-C).	Complete	Yes
c-05	Subcontract/Purchase Order Matrix which Indicates Closeout Status.	Complete	Yes
Deliverables for Component 4: Transportation, Installation, Operation and Maintenance of Kandahar (Shorandam) Industrial Park Diesel Power Plant (Source: Prime Contract Section F.4.A “Deliverables and Delivery Schedule”) Method of Verification per the Prime Contract follows each Deliverable			
d-01 (Pre-Mod 10)	Secure transportation of repaired and tested equipment by others from the Breshna Kot Substation to KIP (Kandahar Industrial Park, aka SIPD). – METHOD OF VERIFICATION – Site Inspection and document review.	Complete	Yes
d-02 (Pre-Mod 10)	Delivery report per main unit submitted, to include nameplates and photographs. – METHOD OF VERIFICATION – Delivery Report.	Complete	Yes
d-03, a-03 and a-07 (for government approved plans) (Pre-Mod 10)	Generators installed, electrically synchronized, and commissioned. – METHOD OF VERIFICATION – Witness according to government approved commissioning plan.	Complete	Yes
d-05 (Pre-Mod 10)	DPP is connected to the medium voltage (20 KV) distribution system. – METHOD OF VERIFICATION – Witness of connections according to government approved plan.	Complete	Yes
a-18 (Pre-Mod 10)	Progress reports submitted to include photographs. – METHOD OF VERIFICATION – Weekly Report.	Complete	Yes

Document # (if applicable)	Description (Note: The Section references below are the BVSPC-USAID Contract sections wherein specific deliverable requirements are located.)	Status	In Closeout Package?
d-07 (Pre-Mod 10)	<p>Facility improvements specified in Task C.3.1.4 (iv) completed. Task C.3.1.4 (iv) included the items listed below.</p> <p>In consultation with the KIP site owner, AISA, the Contractor shall make the following facility improvements: Increase the height of existing security walls or construct new as needed. The Contractor shall clearly present this in design submittals (Section F, B. Reports, C. Technical Reports, Design Report). Construct covered/shade area of a durable long-term structure with lighting and other permanent features for the diesel gensets. Provide permanent installation of fuel tanks which currently have temporary installation. Install delivery truck fuel off-loading equipment. Construction kitchens and restroom facilities as needed for DPP staff. The Contractor shall clearly present this in design submittals (Section F, B. Reports, C. Technical Reports, Design Report).</p> <p>The Contractor shall begin this task after completing deliverables under Task C.3.1.4 (i). – METHOD OF VERIFICATION – Site inspections according to government approved plan.</p>	Complete	Yes
d-08 (Pre-Mod 10)	Completion report submitted. – METHOD OF VERIFICATION – Completion Report.	Complete	Yes
d-09 (Pre-Mod 10)	Operation and maintenance of the DPP provided. – METHOD OF VERIFICATION – Site inspections and document review.	Complete	
d-10 (Pre-Mod 10)	Training plan for DPP operations at KIP, KE (Kandahar East) and Breshna Kot.	Complete	Yes
NOTE>>>	<u>Under Modification 10, additional scope of work was added (highlighted below in yellow) and select deliverables which existed Pre-Mod 10 were maintained or marginally modified. For purposes of clarity the Pre-Mod 10 deliverables which continued are repeated here.</u>		
d-01 (Pre-Mod 10 & Post-Mod 10)	Secure transportation of repaired and tested equipment by others from the Breshna Kot Substation to KIP (Kandahar Industrial Park, aka SIPD). – METHOD OF VERIFICATION – Site Inspection and document review.	Complete	Yes
d-02 (Pre-Mod 10 & Post-Mod 10)	Delivery report per main unit submitted, to include nameplates and photographs. – METHOD OF VERIFICATION – Delivery Report.	Complete	Yes
d-03, a-03 & a-07 (Pre-Mod 10 & Post-Mod 10)	Generators installed, electrically synchronized, and commissioned. – METHOD OF VERIFICATION – Witness according to government approved commissioning plan.	Complete	Yes

Document # (if applicable)	Description (Note: The Section references below are the BVSPC-USAID Contract sections wherein specific deliverable requirements are located.)	Status	In Closeout Package?
d-04 (Mod 10)	Functional improvements on each diesel generator unit completed. – METHOD OF VERIFICATION – Witness of completion according to government approved plan	Complete	Yes
d-05 (Pre-Mod 10 & Post-Mod 10)	DPP is connected to the medium voltage (20 KV) distribution system. - METHOD OF VERIFICATION – Witness of connections according to government approved plan.	Complete	Yes
d-06 (Mod 10)	Connect DPP to SIP industrial park electrical supply grid. – METHOD OF VERIFICATION – Witness of connections according to government approved plan.	Complete	Yes
d-07 (Pre-Mod 10 & Post-Mod 10)	<p>Facility improvements specified in Task C.3.1.4 (iv) completed. (Task C.3.1.4 (iv) included the items listed below:</p> <ul style="list-style-type: none"> • In consultation with the KIP site owner, AISA, the Contractor shall make the following facility improvements: • Increase the height of existing security walls or construct new as needed. The Contractor shall clearly present this in design submittals (Section F, B. Reports, C. Technical Reports, Design Report). • Construct covered/shade area of a durable long-term structure with lighting and other permanent features for the diesel gensets. • Provide permanent installation of fuel tanks which currently have temporary installation. • Install delivery truck fuel off-loading equipment. • Construction kitchens and restroom facilities as needed for DPP staff. The Contractor shall clearly present this in design submittals (Section F, B. Reports, C. Technical Reports, Design Report). <p>The Contractor shall begin this task after completing deliverables under Task C.3.1.4 (i). – METHOD OF VERIFICATION – Site inspections according to government approved plan.</p>	Complete	Yes
d-08 (Pre-Mod 10 & Post-Mod 10)	Completion of report submitted with as-installed single line diagrams and as-built drawings for any site modifications made under this contract.	Complete	Yes
d-09 (Pre-Mod 10 & Post-Mod 10)	Operation and Maintenance of the DPP.	Complete	Yes
d-10 (Pre-Mod 10 & Post-Mod 10)	Training plan for DPP operations.	Complete	Yes
d-11 (Mod 10)	Six (6) month supply of spare parts and consumables along with inventory and price lists.	Complete	Yes

Document # (if applicable)	Description (Note: The Section references below are the BVSPC-USAID Contract sections wherein specific deliverable requirements are located.)	Status	In Closeout Package?
d-12 (Mod 11)	Conceptual layout and design for installing centrifuge filtration systems at SIPD and Bagh-e-Pul.	Complete	Yes
g-06 a and b	USAID Final Disposition Instructions.	Complete	Yes
g-07a & b	DABS Hand Receipt of Equipment and Tool Inventory.	Complete	Yes
m-01a	SUBSTANTIAL COMPLETION: Pre-Mod 10 & 11 1) Certificate of Substantial Completion with Schedule of Defects (if applicable).	Complete	Yes
m-01a-1	SUBSTANTIAL COMPLETION: Post-Mod 10 & 11 1) Certificate of Substantial Completion with Schedule of Defects (if applicable).	Complete	Yes
m-01b	FINAL INSPECTION AND ACCEPTANCE: Pre-Mod 10 & 11 1) Final Punch List (if applicable). 2) Final Completion and Acceptance Certificate. 3) Bilateral Transfer Letter.	Complete	Yes
m-01b-1	FINAL INSPECTION AND ACCEPTANCE: Post-Mod 10 & 11 1) Final Punch List (if applicable). 2) Final Completion and Acceptance Certificate. 3) Bilateral Transfer Letter.	Complete	Yes
m-01c	WARRANTY PERIOD & FINAL WARRANTY INSPECTION: 1) Warranty Certificate.	Complete	Yes
m-02	Prime Contract original signed copy in files KC.	Complete	Yes
m-03	Copy of all Fully Executed Prime Contract Modifications and Change Orders in electronic folder.	Complete	Yes
m-04	USAID Closing Statement Letter + BV Response Letter.	Not Received from USAID	N/A
m-05	Copy of Closeout Documentation - List of Closeout Documents handed over/uploaded to USAID.	Complete	Yes

1 KANDAHAR HELMAND POWER PROJECT (KHPP) OVERVIEW

1.1 KHPP Background

The purpose of the Kandahar Helmand Power Project (KHPP) contract, issued by the United States Agency for International Development (USAID) on 09 December 2010, was to increase the supply and reliability of electrical power in the areas in southern Afghanistan served by the South East Power System (SEPS), particularly the City of Kandahar. The contract was to support the SEPS reconstruction and thereby increase the quality of life of people in Kandahar and Helmand Provinces. The KHPP was conceived as a critical component of the United States (US) government's Counterinsurgency (COIN) strategy in southern Afghanistan. KHPP is a part of a larger US government sponsored program involving multiple USAID Implementers, the US Army Corps of Engineers (USACE), and other Donors to improve the SEPS and connect it with other electrical grids in Afghanistan.

A reliable sustainable electric power generation, transmission, and distribution system in Kandahar and Helmand Provinces is an important objective of the Government of the Islamic Republic of Afghanistan (GIROA). The system is expected to fuel economic growth not currently possible, especially in Kandahar City, the second largest city in Afghanistan, and a center for education, health care, manufacturing, and transportation. Kandahar City has an electrical supply shortfall of at least 40 megawatt (MW) for its approximately 850,000 residents.

SEPS as a system is composed of multiple generation islands, aged transmission lines, and multiple distribution systems in southern Afghanistan serving 380,000 of the 1.7 million people residing in the region. Diesel generator sets and the Kajaki Hydroelectric Power Plant (HPP) provide the majority of the electric power generation in the system. The 222 kilometer (km) SEPS transmission system operates at 110 kilovolts (kV), medium voltage distribution at 20 kV, and low voltage distribution at 400 volts (V). Kandahar City represents the largest power demand node within SEPS.

The Kajaki HPP was the first significant generation source installed in SEPS. Supported by the US government, Kajaki HPP came online in the mid-1970s. Prior to execution of the KHPP contract, power arrived in Kandahar City through one aged 25 megavolt amperage (MVA) transformer located at the Kandahar Breshna Kot (BK) Substation. USAID began rehabilitation of the Kajaki HPP in 2003. At present, Kajaki HPP provides (at peak production) 32 MW (at high water periods), with 12 MW of power serving Kandahar City and 20 MW of power transmitted to the remaining distribution nodes served by the SEPS transmission backbone.

USAID facilitated the installation of fourteen (14) KTA-50 diesel generators at the BK Substation in late 2003 to supplement generation for Kandahar City during the Kajaki HPP rehabilitation. In 2008, five (5) additional diesel generators owned by Da Afghanistan Breshna Moasessa (now known as Da Afghanistan Breshna Sherkat, or

DABS) were installed at BK. This installation was done to increase short term generation capacity, as the rehabilitation efforts at Kajaki HPP had been prolonged due to continued insurgent activities and, the Kandahar City power supply was taking on increasing importance in International Security Assistance Forces' (ISAFs) counter-insurgency strategy in the area.

As of this report date, the BK Substation diesel generators have a combined generating capacity of 20.5 MW at peak due to new units either provided or installed by USAID. These units consist of the 10.5 MW MTU units, 5 MW of aged derated KTA-50 units, and 5 MW provided by aged derated QSK-60 units. The new 10.5 MW MTU units were installed and commissioned by the KHPP.

1.2 KHPP Summary of Scope of Work

The KHPP scope of work initially contained six (6) Components with ten (10) Sub-Components, outlined below which, integrated with other work on SEPS, were designed with the purpose of increasing and improving the sustainability and reliability of the electric supply provided by the SEPS:

Component 1. Improve Kandahar Power Distribution System

Subcomponent 1: Replace the Kandahar Breshna Kot Substation.

Subcomponent 2: Refurbish Kandahar City Medium Voltage (MV) Distribution System.

Subcomponent 3: Construct a new Kandahar East Substation to: (1) enhance the reliability of the system serving Kandahar, and (2) serve as a receiving point for an expected link between the SEPS and the North East Power System (NEPS), which is Afghanistan's major source of lower cost imported power from the Central Asian Republics).

Subcomponent 4: Construct a transmission line between the Kandahar Breshna Kot Substation and the new Kandahar East Substation.

Subcomponent 5: Replacement of Aged Diesel Generators at the Breshna Kot Substation.

Component 2. Build Durai Junction Substation

Subcomponent 1: Build a new Substation at Durai Junction.

Subcomponent 2: Procure equipment for additional Substations.

Component 3. Program Support and Program Management

Component 4. Transportation, Installation, Operation and Maintenance of Kandahar (also known as Shorandam) Industrial Park Diesel Power Plant (also known as SIPD)

Component 5. Rebuild the Kajaki Dam Substation and Local Distribution System

Component 6. Install and Commission Kajaki Unit 2

- Subcomponent 1: Perform inventory assessment of Government Furnished Equipment (GFE).
- Subcomponent 2: Repair GFE, and provide missing and additional new equipment for completing Kajaki Unit 2 installation.
- Subcomponent 3: Install and commission Kajaki Unit 2.

USAID issued the KHPP contract to Black & Veatch Special Projects Corporation (BVSPC) to provide engineering, procurement, construction, and all material, equipment and/or services necessary to successfully complete each of the Components and Subcomponents in accordance with the requirements of the contract.

BVSPC was tasked with developing appropriate engineering design and construction methodologies, as well as be responsible for procurement, design, construction, quality control, and testing and commissioning. BVSPC was also to provide relevant warranties for each Component and Subcomponent and the support services needed to implement those activities (security, life support, ground and air movements, etc.). One of the key deliverables of the KHPP was the sustainability of the infrastructure being developed. Drawing from previous operation and maintenance (O&M) training programs that BVSPC implemented on behalf of USAID through the Afghanistan Infrastructure Rehabilitation Program (AIRP), BVSPC was required to recommend and, in most instances, implement the training and skills development needed to sustain the efforts undertaken in this contract. In addition, BVSPC was to provide spare parts inventory necessary for DABS to perform the required operation and maintenance (O&M) of installed equipment in each Component and its Subcomponent. These recommendations were, in select instances, to be submitted to USAID prior to initiation of the respective subcomponent, and were to be based on the BVSPC assessment of the capability and intent of the recipient to execute required O&M functions.

The security situation in the southern region of Afghanistan changed as KHPP was implemented. While Regional Command Southwest and the U.S. Marines achieved substantial success in clearing the Upper Sangin Valley in late 2011, thus enabling KHPP to execute the first contractor convoy to Kajaki in several years, the region was impacted by significant increases in anti-government activity in 2011 to 2012 as the GIRoA, with ISAF support, increasingly imposed GIRoA control over the region. As a result, companies and organizations willing to work in the region significantly increased their pricing to accommodate higher risk and security costs by increasing their “risk premium” with their standard pricing. In addition, commodity costs and construction costs increased more rapidly than expected within Afghanistan during 2011. The unexpected cost increases impacted all implementing agencies from KHPP to USACE and diminished the collective capability of all agencies involved to meet initial objectives.

Recognizing that budgets would not allow delivery of all Components and Subcomponents, USAID, in concert with Regional Command South, reviewed the KHPP program in mid-2011 to determine what adjustments could be made to retain core program objectives aligned with COIN strategy while cutting projected costs. This review resulted in the realignment and descoping of select project activities. The net result was the descoping of Subcomponents 1.3, construction of a new Kandahar East Substation and Subsection 1.4, construction of a transmission line between the Kandahar BK Substation and the new Kandahar East Substation, with the intent to transfer these activities to USAID’s Power Transmission Expansion and Connectivity (PTEC) program then in development. In addition the scope of Subcomponent 1.2 was adjusted to eliminate planned additional connections to the Kandahar distribution system, thereby avoiding potential “negative COIN impact” until such time as additional sustainable non-diesel based generation could be brought to bear to supply additional customers (Kajaki Unit 2 and the NEPS to SEPS connection to bring lower cost imported hydropower).

The elimination of the Substation at Kandahar East and the transmission line was accompanied by a realignment of Subcomponent 1.5, the placement of 14 MTU generators, representing 21 MW of installed capacity at the Kandahar East location. With the implementation of the diesel power “bridging solution” in Kandahar City by US Forces Afghanistan, which added two (2) 10 MW diesel plants in early 2011 operating in separate island modes and, increasing concern regarding the sustainability of additional diesel generation within Kandahar City, the installation of the 14 MTU units was suspended until USAID could further assess the situation. Following the adjustment of KHPP scope, all six (6) original Components remained in the contract, but with the original ten (10) Subcomponents reduced to eight (8).

Following the adjustment of KHPP scope, all six (6) original Components remained in the contract, but with the original ten (10) Subcomponents reduced to eight (8).

1.3 KHPP Contract Evolution

Table 1 lists a history of the changes which have occurred in the Prime Contract between BVSPC and USAID as the needs and demands adjusted due to changing ground conditions in order to maximize benefits to the people of Afghanistan.

Table 1: History of Changes in USAID Contract No. 306-C-00-11-00506-00

Contract	Date	Description
Initial Contract Award	09 Dec 2010	This contract will support US Agency for International Development (USAID), Afghanistan Mission’s Kandahar Power Initiative (KPI).
Contract Modification 01	01 Feb 2011	The purpose of this modification was to add the following in Section H: Special Provisions/Special Contract Requirements to the listed contract as follows: <ul style="list-style-type: none"> • Use of Synchronized Pre-deployment and Operational Tracker (SPOT) for Contractors Supporting a Diplomatic or Consular Mission Outside the United States (Supplement to FAR 52.225-19). • Serious Incident Reporting in Afghanistan. • Gender Integration Requirements.

Contract	Date	Description
Contract Modification 02	17 Mar 2011	The purposes of this Modification were to: <ul style="list-style-type: none"> • Revise Section B.5: Indirect Cost based on BVSPC latest approved NICRA for FY2010. • Revise Section H.22: Consent to Subcontracts to incorporate the approved Subcontracting Plan dated 28 February 2011. • Change the project name from "Kandahar Power Initiative (KPI)" to "Kandahar Helmand Power Project (KHPP)."
Contract Modification 03	27 Jun 2011	The purposes of this modification were to: <ul style="list-style-type: none"> • Incorporate the following clause: <i>The Contractor shall comply with and adhere to all USAID Afghanistan Implementing Partner Notices. Copies of the notices are provided to implementing partners at the time of issuance. Copies are also available upon request from your Cognizant Contracting Officer.</i> • Remind the Contractor of the recently issued Implementing Partner Notice No. OAA-IP- 2011 – 004 which incorporates Mission Order No. 201.04 entitled, "National Security Screening (Non- US Party vetting)."
Contract Modification 04	17 Jul 2011	The purposes of this modification were to: <ul style="list-style-type: none"> • Incorporate no cost changes in Sections C and F. • Incorporate the FAR Clause 52.209-9 under PART II – CONTRACT CLAUSES. SECTION I – CONTRAT CLAUSES.
Contract Modification 05	19 Jul 2011	The purpose of this modification was to provide funding in the amount of \$50,000,000.00, thereby bringing the total obligated amount to \$70,000,000.00.
Partial Suspension of Work	09 Aug 2011	Partial suspension of work affecting: <ul style="list-style-type: none"> • Component 1, Subcomponent 3 • Component 1, Subcomponent 4 • Component 1, Subcomponent 5 • Component 4
Change Order – Scope of Work	08 Sep 2011	SOW changes affecting: <ul style="list-style-type: none"> • Component 1, Subcomponent 3 • Component 1, Subcomponent 4 • Component 1, Subcomponent 5 • Component 4
Change Order – Amendment 01	20 Sep 2011	Changes affecting: <ul style="list-style-type: none"> • Component 1, Subcomponent 3
Change Order – Amendment 02	22 Sep 2011	Changes affecting <ul style="list-style-type: none"> • Component 1, Subcomponent 5 - Diesel Generators
Change Order – Amendment 03	01 Oct 2011	Changes affecting: <ul style="list-style-type: none"> • Component 1, Subcomponent 5 – Diesel Generators • Extension of the Submission Deadline
Change Order – Amendment 04	13 Oct 2011	Changes affecting: <ul style="list-style-type: none"> • Component 1, Subcomponent 5 – Diesel Generators
Change Order – Amendment 05	16 Oct 2011	Changes affecting: <ul style="list-style-type: none"> • Component 1, Subcomponent 5 – Diesel Generators
Change Order – Amendment 06	22 Oct 2011	Changes affecting: <ul style="list-style-type: none"> • Component 1, Subcomponent 5 – Diesel Generators

Contract	Date	Description
Contract Modification 06	12 Nov 2011	The purposes of this modification were to: <ul style="list-style-type: none"> • Provide incremental funding in the amount of [REDACTED], thereby increasing the total obligated amount from [REDACTED] to [REDACTED] • Revise Section B.5: Indirect Cost based on BVSPC's approved provisional rates for FY2011. • Revise Sections C, F and J.
Change Order – Scope of Work	06 Feb 2012	SOW changes affecting: <ul style="list-style-type: none"> • Component 1, Subcomponent 1 • Component 1, Subcomponent 5
Contract Modification 07	26 Sep 2012	The purposes of this modification were to: <ul style="list-style-type: none"> • Provide incremental funding in the amount of [REDACTED], thereby increasing the total obligated amount from [REDACTED] to [REDACTED]. • Modify PART I-THE SCHEDULE I. SECTION B-SUPPLIES OR SERVICES AND PRICE/COSTS, paragraph (c).
Contract Modification 08	29 Sep 2012	The purposes of this modification were to: <ul style="list-style-type: none"> • Provide incremental funding in the amount of [REDACTED], thereby increasing the total obligated amount from [REDACTED] to [REDACTED]. • Modify PART I-THE SCHEDULE I. SECTION B-SUPPLIES OR SERVICES AND PRICE/COSTS, paragraph (c).
Contract Modification 09	30 Sep 2012	The purposes of this modification were to: <ul style="list-style-type: none"> • Correction to Modification 8 to provide incremental funding in the amount of [REDACTED], thereby decreasing the total obligated amount from [REDACTED] to [REDACTED]. • Provide incremental funding in the amount of [REDACTED], thereby increasing the total obligated amount from [REDACTED] to [REDACTED].
Partial Suspension of Work	28 Jan 2013	Partial suspension of work affecting: <ul style="list-style-type: none"> • Component 6, Subcomponent 3
Contract Modification 10	14 Feb 2013	The purpose of this modification was to revise Sections B, C, F, H, I, J and contract attachments.
Contract Modification 11	29 Sep 2013	The purposes of this modification were to extend the period of performance from 30 September 2013 to 31 December 2013, revise budgets, and clarify deliverables in multiple sections.
Contract Modification 12	24 Dec 2013	The purpose of this modification was to add Subcomponent 6.4, Technical Assistance to USAID on Kajaki Unit 2 on budget implementation until 30 November 2015 and to extend all remaining Subcomponents to 28 February 2014.
Contract Modification 13	06 Aug 2014	The purpose of this modification was to finalize agreements on fee, Durai Junction cure cost absorbed by BVSPC, applicable NICRA, and clarify Tasks and Deliverables as needed.

See **Attachment m-03** for the documentation listed in the table above.

The key to effectiveness throughout the implementation of KHPP has been to maintain flexibility to meet new opportunities to enhance program impact as the succession of operations in southern Afghanistan changed. In partnership with USAID, BVSPC maintained significant flexibility and made adjustments as needed and directed in order to deliver significant benefit to the people served by the SEPS.

1.4 KHPP Contract Coordination and Communication

At the inception of the KHPP, USAID coordinated the relationship with DABS Kabul to maintain communication and reporting of KHPP activity and progress. BVSPC maintained communication and reporting of KHPP field activity with the Kandahar DABS Director and his direct reports. BVSPC continued to coordinate and maintain liaison with Kandahar DABS, as well as Regional Command South (RC-S) and Regional Command Southwest (RC-SW) as requested by the COR and the USAID Onsite Managers (OSM). BVSPC worked directly with DABS in Kandahar and Helmand Provinces, throughout the implementation of the KHPP. The COP and the Transmission and Distribution Lead and Generation Lead (“Leads”) coordinated the communications with all stakeholders in Kandahar and Helmand addressing with each issues of concern as needed. The COP and COR communicated and coordinated all issues of implementation between themselves usually on a daily basis.

In order to establish USAID field presence for the project, and facilitate two-way reporting and communication, USAID designated one OSM for each of the two Regional Commands. The OSMs played a strong role in enhancing communications between all stakeholders in Kandahar and Helmand Provinces. The OSM reported to the COR, while maintaining coordination lines of communication with BVSPC Leads and Managers. The BVSPC Construction Managers and the O&M Managers, meanwhile, worked directly with their counterparts in Kandahar DABS, and also communicated mutual needs and concerns in coordination with Leads. The working relationships between BVSPC staff and the Kandahar DABS Director, senior managers, and DABS staff in coordination with the COR and OSM were consistently positive and productive.

2 COMPONENT 4: TRANSPORTATION, INSTALLATION, OPERATION AND MAINTENANCE OF KANDAHAR (SHORANDAM) INDUSTRIAL PARK DIESEL POWER PLANT

2.1 Objective

The primary objective of Component 4 of KHPP was to install and commission ten (10) AKSA diesel engines and ancillary equipment on the existing power plant site of the Shorandam Industrial Park (SIP) and, connect the plant to the Kandahar City distribution system grid. KHPP was to receive all repaired, repurchased (due to inability to repair), and completely tested equipment at the site to complete the SIP Diesel Power Plant (SIPD) installation and commissioning. KHPP was to complete the installation and commissioning within 42 days of receipt of the repaired equipment.

2.2 History

In 2007, USAID planned and, through an Implementer, ordered equipment to construct an Industrial Park with a nominal 6.5 MW power plant near the City of Kandahar. The main components of the power plant were ten (10) AKSA generators, rated at 800 kVa/640 kW for prime power application, five (5) 0.4/20 kV step-up transformers, one (1) step-down 20/0.4 kV transformer, and switchgear. The original cost of the equipment

was indicated by USAID to be \$2.5 million. The design configuration was to connect two generators to a 20 kV medium voltage (MV) line through each step-up transformer. However, after completing much of the site civil work, USAID terminated the original SIP contract in 2008, thus halting construction of the industrial park and the SIPD. With SIPD site work only partially complete (see **Attachment a-9**, Photo Album for site photos), USAID directed the Implementer to store the power plant equipment at a separate site in Kandahar City. The stored equipment was damaged from a bomb blast which partially destroyed the buildings and laydown area where the equipment was stored in 2009. The blast destroyed the switchgear, severely damaged the housings of the generating units, and left the salvageability of the transformers in question.

USAID's Afghanistan Infrastructure and Rehabilitation Program (AIRP, a joint venture of BVSPC and Louis Berger) was requested on 10 December 2008 to define the actions and cost to be incurred to assume the control of and provide security for the damaged diesel generating equipment, including transformers and switchgear in Kandahar. The AIRP responded with a proposal under Work Order 21-02 on 12 May 2009 to assume control and provide security for the equipment in Kandahar. The proposal included the provision of technical subject matter experts to rotate the equipment to the extent possible while in storage. The conveyance of the equipment from USAID to AIRP excluded as-built or design drawings of both the industrial park and the expected installation of SIPD.

On 07 February 2009, USAID issued a Request for Proposal to the AIRP to provide cost and schedule estimates for testing and repairing the diesel generating equipment, transformers, and switchgear and to render the equipment functional. AIRP responded and was given Work Order 21.07 to provide the assessment on 08 March 2010. Work Order 21.07, as directed by USAID, included three phases of work as listed below.

The purpose of this Work Order (as quoted directly from the work order) is to provide the following:

1. "Testing and repair services for the ten generators and six transformers and associated electrical equipment now in storage in Kandahar.
2. Inspection and repair services for the associated fuel tanks and equipment located at the Kandahar Industrial Park site.
3. A site selection criterion to allow USAID to make a determination of where to place the generators and associated equipment."

Within the Work Order, the deliverables were to be completed in three phases as to include the following (which is a direct quote from the Work Order scope of work):

"a) Phase I - Initial Equipment Testing:

Contractor will test and evaluate all ten (10) generators and six (6) transformers and submit a report for repair work required.

b) Phase II – Articulation of Criteria for Site Selection

“The Contractor will establish simple criteria to justify placement of the generators in a given location based on the needs of DABS, the Regional Command South, electricity demand, cost, logistics, and other factors to be determined. The criteria will be applied and recommendations made to USAID in the form of a short report as to how many generators should be placed in which locations. Possible locations include, but are not limited to, Kandahar, Lashkar Gah, Jalalabad, Torkham Gate, and Kabul.

Special consideration should be given to setting up a DABS-run power plant at the Kandahar Industrial Plant and transmitting the power to Kandahar City. This would allow for provision of power to Kandahar City to meet immediate needs as well as potential utilization of the generators for the industrial park should that move forward in the future.”

c) Phase III – Procurement of Parts and Equipment Repair: Option 1 to be exercised by USAID.

USAID reviewed the Phase I test reports and Phase II Site Selection report and approved the repair work to be conducted under Phase III.

The following scope of work was directed by USAID upon notice to proceed to Phase III:

- Procure necessary spare parts for repair of all damaged equipment.
- Procure necessary equipment to achieve power supply in identified locations.
- Repair all the damaged generators and transformers.
- Provide final testing.
- Provide a Phase III report, including detailed cost of all the above activities.

In 2009, the damaged equipment was relocated to the BK Substation in Kandahar for initial assessment of damage through Work Order 21.07 under the AIRP contract. The AIRP provided the final report for work carried out under Work Order 21-07 on 21 August 2010.

USAID responded to the 21 August 2010 report on 06 September 2010 with Work Order 21-08, under which the AIRP was to perform the following:

1. Repair and test the generators and generator housings.
2. Replace the switchgear.
3. Test the transformers and inform USAID if replacement is required.

The repair and testing of the generators and the procurement of new switchgear through Work Order 21.08 were performed under a USAID approved subcontract with Power Generation Solutions (PGS). The transformers had been stored without oil for a number of years. It was not possible to test the transformers until placed on load once the SIPD was operating. Following discussions of the risks involved with the transformers being dormant without oil for an extended period and their relatively low replacement cost, USAID agreed that BVSPC should proceed under the KHPP with the procurement of new transformers. The greatest risk avoided was the transformers containing water within their shell due to condensation; this water could have resulted in the transformer exploding upon energization, likely causing serious injury to anyone in proximity.

Following an examination and assessment of the equipment, PGS determined the engines needed to be moved to Kabul in order to take advantage of better industrial shop services needed to repair the housing. The AIRP concurred with PGS and, with USAID approval, moved the units to Kabul for repair and testing. Once repaired, AIRP/PGS delivered the units directly to SIP in June 2011 and transferred custody to BVSPC for installation at SIP as directed by USAID under Component 4. The switchgear and transformers were reordered and shipped directly to SIP.

Component 4 implementation evolved into two distinct phases: (1) Pre-receipt of Modification 10 (referencing all activity under Component 4 before Modification 10 in the Prime Contract, signed 14 February 2013) (“Pre-Mod 10”); and (2) Post-receipt of Modifications 10 and 11, which addressed changes in the needs at SIPD following unexpected storm-related damage to the site and unexpected results from DABS operations of the SIPD following SIPD handover to DABS on 31 December 2012 (Post-Mod 10 and 11).

Pre-receipt of Modifications 10 and 11 (“Pre-Mod 10”)

BVSPC was contracted to undertake the transportation (from Kandahar BK Substation to SIP), installation, commissioning, and O&M of the SIPD diesel generators under the original Component 4. The transportation of the diesel generators was not necessary, as the AIRP transported the diesel generators from repair facilities in Kabul directly to the SIPD site. The new switchgear was shipped directly to SIPD from the supplier; the transformers and other ancillary equipment (e.g., cables, and connections) were also shipped directly to the SIPD site from BK.

As indicated in Section 2.2, the SIPD site was an existing, partially completed site with part of the civil infrastructure already in place. With USAID consent, BVSPC issued a firm fixed price, sole source subcontract to PGS on 22 March 2011 to install and commission the SIPD diesel generators. The kick-off meeting for the SIPD subcontract was delayed until 17 April 2011 due to travel constraints resulting from security issues. Initial assumptions concerning the adequacy of pre-existing site civil work and availability of materials to complete SIPD installation proved to be inaccurate; incremental civil

works and additional materials were needed, which impacted the SIPD schedule and commissioning date.

The SIP was managed under the auspices of the Afghanistan Investment Support Agency (AISA). As the SIPD approached commissioning, BVSPC approached AISA with a request to provide the AISA staff to be assigned to operate and maintain the SIPD in order to provide them training. AISA ultimately made the decision to have DABS manage the SIPD following months of discussions between USAID, AISA, BVSPC, and DABS. The delay resulting from deliberations between AISA and DABS impacted the time available for BVSPC to provide training in the O&M of the SIPD. DABS was finally able to provide a complete staff of thirteen (13) assigned to SIPD for training on 05 November 2012.

The expected turnover date of SIPD to DABS was 31 December 2012; therefore, the training time was very constrained. This time constraint ultimately required very intense training which was achieved but left doubt as to the absorption of the training provided. The Training Plan approved by USAID was based on thirteen (13) weeks of training which had to be consolidated into seven (7) weeks. (Refer to **Attachment d-10, Sustainability Report**, which details the Training Plan and organization of DABS staff into O&M teams.) See **Attachment a-25** for the resulting Training Report.

BVSPC provided intensive plant O&M training for the thirteen (13) DABS trainees from 05 November 2012 to 31 December 2012. On 30 December 2012 BVSPC performed operational acceptance testing with representatives from USAID, RC-South, and DABS. In accordance with Implementation Letter No. 46, USAID transferred ownership and O&M responsibilities for SIPD over to DABS on 31 December 2012. With acceptance testing and equipment conveyance complete, BVSPC's contracted Tasks and Deliverables then applicable to Component 4 were complete.

Post-receipt of Modifications 10 and 11

In early 2013, following official turnover to DABS by USAID, SIPD operation was impacted by both DABS management issues and storm-related damage to the site. Due to these issues, both of which are detailed in this report, USAID (through Modifications 10 and 11) requested that BVSPC return to the SIPD site as needed and provide on-call technical support and additional training to DABS at SIPD until 30 September 2013. The on-call support requests were made by DABS to USAID, who then directed BVSPC to provide or not provide the services requested.

2.3 Component 4: Pre-Modification 10 Task and Deliverables Modifications and Change Order History

Table 2 lists (by date) first USAID Tasks and then USAID Deliverables (with final Tasks and Deliverables in bold) under the original Prime Contract applicable to Component 4.

These tasks and deliverables were implemented prior to receipt of Modification 10 and Modification 11 scope of work adjustments directed by USAID.

Table 2: Component 4 – Tasks and Deliverables (Pre-Modification 10)

Source & Date	Tasks (From Prime Contract Section C.3.1.4 “Tasks”)	Completed as tasked?
Original Contract 09 Dec 2010	<p>Task i: Provide secure transport of repaired and tested equipment from the Breshna Kot Substation to KIP. Equipment includes:</p> <ul style="list-style-type: none"> • Ten (10) AKSA manufactured diesel generators, rated at 800 Prime KVA each. • Five (5) step-up 0.4/20 KV transformers rated at 1,700 KVA. • One (1) step-down 20/0.4 KV transformer rated at 630 KVA, and associated accessories. 	Yes (performed by AIRP)
Original Contract 09 Dec 2010	<p>Task ii: Install (including civil work), electrically synchronize, and commission the generators. Attachment 7 – Diagram D-5 KIP to DABs single line shows the DPP as the “6.6 MW Power Plant.” (Note: Original contract Task ii incorrectly referred to Attachment 7 – Diagram D-5. Reference should have been made to Attachment 8 – Diagram D-6.)</p>	Yes
Original Contract 09 Dec 2010	<p>Task iii: In consultation with DABS, connect the DPP to the medium voltage (20 KV) distribution system. In the connection, two diesel generators shall share one step-up transformer. Inform the Kandahar PRT and Regional Command South (RC-S) of this activity.</p>	Yes
Partial Suspension of Work 09 Aug 2011	<p>Task iii: Work to connect the 6.6 MW Power Plant to the "No Drug Mountain" distribution system. Direction will be forthcoming for a less costly connection to an alternate distribution system which more effectively utilizes the generation capacity of the Power Plant. The Contractor shall continue to make all other preparations necessary for load testing the 6.6 MW Power Plant per the Contract.</p>	Modified by Change Order 08 September 2011
Change Order SOW Change 08 Sep 2011	<p>Task iii: Provide to-scale drawings of the proposed connection between DPP and the medium voltage distribution system, including placement of the poles and location of any other work to be performed. In consultation with DABS, connect the DPP to the medium voltage (20 kV) distribution system per Revised Attachment D-6 (Contract p 76, Attachment 8, revised dated 08 September 2011) KIP to DABS Single Line. In the connection, two diesel generators shall share one step-up transformer. Inform the Kandahar PRT and Regional Command South (RC-S) of this activity.</p>	Superseded by Modification 06
Contract Modification 06 12 Nov 2011	<p>Task iii: In consultation with DABS and USAID, connect the DPP to the medium voltage (20 kV) distribution system per Revised Attachment 0-6 (Contract p 76, Attachment 8 revised dated 08 September 2011): "KIP to DABS Single Line." In the connection, two diesel generators shall share one step-up transformer. Inform the Kandahar PRT and Regional Command South (RC-S) of this activity. Incorporate this work into as-built drawings for KIP.</p>	Yes

Source & Date	Tasks (From Prime Contract Section C.3.1.4 “Tasks”)	Completed as tasked?
Original Contract 09 Dec 2010	<p>Task iv: In consultation with the KIP site owner, AISA, the Contractor shall make the following facility improvements:</p> <ul style="list-style-type: none"> • Increase the height of existing security walls or construct new as needed. The Contractor shall clearly present this in design submittals (Section F, B. Reports, C. Technical Reports, Design Report). • Construct covered/shade area of a durable long-term structure with lighting and other permanent features for the diesel gensets. • Provide permanent installation of fuel tanks which currently have temporary installation. • Install delivery truck fuel off-loading equipment. • Construction kitchens and restroom facilities as needed for DPP staff. The Contractor shall clearly present this in design submittals (Section F, B. Reports, C. Technical Reports, Design Report). <p>The Contractor shall begin this task after completing deliverables under Task C.3.1.4 (i).</p>	Yes (Security wall work not needed, nor was kitchen immediately needed due to secure perimeter and DiFAC privileges provided by US Army.)
Original Contract 09 Dec 2010	<p>Task v: Provide security, operation, and maintenance of the DPP. Security shall start upon departure of the first equipment from the Breshna Kot Substation. The operation and maintenance shall commence on the day in which deliverables under Task C.3.1.4 (ii) are completed.</p>	Yes (Contract security not required due to secure perimeter provided by US Army.)
Original Contract 09 Dec 2010	<p>Task vi: Provide capacity development activity by training of the local Da Afghanistan Breshna Sherkat (DABS) staff in the operation and maintenance requirements of the DPP.</p>	Yes
Source & Date	Deliverables (from Table F.4. A “Deliverables and Delivery Schedule” in the Prime Contract)	Documentation Location in Attachments
Original Contract 09 Dec 2010	Deliverable 1: Secure transportation of repaired and tested equipment from the Breshna Kot Substation to KIP - 14 days following notification generators are ready for installation.	d-01
Original Contract 09 Dec 2010	Deliverable 2: Delivery report per main unit submitted, to include nameplates and photographs – one (1) week after completion of Deliverable 1.	d-02
Original Contract 09 Dec 2010	Deliverable 3: Generators installed, electrically synchronized, and commissioned - NLT 42 days following completion of Deliverable 1.	d-03, a-03 and a-07 (for government approved plans)
Original Contract 09 Dec 2010	Deliverable 4: DPP is connected to the medium voltage (20 KV) distribution system - 14 days following completion of Deliverable 3.	d-05
Original Contract 09 Dec 2010	Deliverable 5: Progress reports submitted, to include photographs - weekly until completion of Deliverable 5.	a-18

Source & Date	Tasks (From Prime Contract Section C.3.1.4 “Tasks”)	Completed as tasked?
Original Contract 09 Dec 2010	Deliverable 6: Facility improvements specified in Task C.3.1.4 (iv) completed - 100 days after NTP.	d-07
Original Contract 09 Dec 2010	Deliverable 7: Completion Report – one (1) week after completion of Deliverable 4 or 6, whichever is later.	d-08
Original Contract 09 Dec 2010	Deliverable 8: Operation and maintenance of the DPP provided - from commissioning of the first generator to NTL 31 December 31 2012.	d-09
Original Contract 09 Dec 2010	Deliverable 9: Training plan for DPP operations at KIP, KE, and Breshna Kot - 30 days following NTP.	d-10

The work undertaken to complete each Task and provide the required contract Deliverable will be further detailed under Section 3.2: Implementation of Work, provided below. Although some Pre-Mod 10 milestones were not accomplished per contract schedule requirements, all Pre-Mod 10 deliverables were completed prior to the scheduled 31 December 2012 turnover of SIPD to DABS. A SIPD Turnover Action Plan meeting and site visit was conducted between ISAF, USAID, BVSPC staff, and DABS on 17 December 2012. Refer to **Attachment d-08**, which includes Attachment J: Turnover Plan and Notes. Through Implementation Letter No. 46, USAID turned over the SIPD to DABS On 30 December 2012.

Following the official turnover, the thirteen (13) DABS staff at SIPD, trained by BVSPC diesel experts under a USAID approved plan, vacated the site. DABS had not completed the hiring process of the SIPD DABS staff and, the SIPD DABS staff refused to work without formalizing their employment. DABS replaced the trained staff with available DABS staff which was neither well-trained on SIPD O&M nor adequate in number. At this time, BVSPC, at the request of DABS and as approved by USAID, sent limited staff from the BK diesel generating station as needed to assist DABS.

The DABS staff onsite received a DABS procured fuel delivery in January 2013. Upon receiving the fuel, DABS staff made the decision to remove the fuel receiving filter in order to accelerate the fuel delivery flow. This action allowed significant contaminants to enter the onsite fuel tanks, eventually flowing to the diesel generators. The contaminated fuel resulted in two engines (Engines 3 and 8) failing due to fouled fuel injectors. Upon request from USAID, BVSPC diesel staff went to the site and evaluated the damage, intending to assist in repair of the engines if possible. Recognizing the DABS staffing problem, DABS requested that USAID provide BVSPC staff to remain onsite. BVSPC staff visited SIPD and assessed the extent of damage caused by the fuel mishandling. (Refer to **Attachment d-04** for the SIPD Assessment Report.) The ongoing technical and staffing challenges facing DABS for the successful operation of the SIPD were a primary reason behind USAID’s issuance of Modification 10 to the Prime Contract, directing BVSPC to again provide DABS O&M assistance and training at SIPD.

Adding to problems related to DABS staffing issues, a February 2013 storm event impacted SIPD with unseasonably heavy precipitation and significant local flooding. The SIP site had been “hardened” when the US Army assumed it in 2010 to position a “bridging” diesel plant on the SIP site. (“Big SIP,” as it became known, was a 10 MW Caterpillar diesel plant installed by USACE through a contract with American International Power; Big SIP was located adjacent to the SIPD site within the SIP perimeter.) The hardening included high concrete T-walls around the site perimeter to protect US Army personnel and the “Big SIP” plant. The tightly spaced T-wall sections had too-few and too-small drainage ports, thus disrupting site drainage and effectively turning the SIPD site into a heavily flooded water catchment area. (See **Attachment a-09** Photo Album, SIPD Flood.) The flood did not damage the actual generating units, but did cause limited damage to the onsite bulk fuel storage and delivery system as a result of the below grade storage tanks floating upward when the below grade storage vaults became flooded. Due to this damage and per DABS request, USAID directed additional tasks under Prime Contract Modification 11 (as indicated in Table 3 below) to eliminate the risk of a repeat flood causing similar damage.

2.4 Component 4: Modifications 10 and 11 Tasks and Deliverables Modifications and Change Order History

Table 3 indicates by date USAID Tasks and Deliverables applicable to the Component 4 scope of work which were added by Prime Contract Modifications 10 and 11. (Although Pre-Mod 10 Tasks and Deliverables were repeated in Modifications 10 and 11, they were removed from Table 3 unless modified to clearly delineate additional requirements added by the Post-Mod 10 and 11 Tasks and Deliverables.)

Table 3: Component 4 – Tasks and Deliverables (Modifications 10 and 11)

Source & Date	Tasks (From Prime Contract Section C.3.1.4 “Tasks”)	Completed as tasked?
Contract Modification 10 14 Feb 2013	Task ii: Install (including additional civil work as required to the existing power plant site as provided by USAID), electrically synchronize, and commission the generators. Carry out the following functional improvements to each diesel generator unit, using DABS labor to the maximum extent possible: <ul style="list-style-type: none"> • Install oil sump temperature monitoring devices in unused oil pan plugs in accordance with manufacturer requirements. • Install bypass oil filtration in accordance with manufacturer recommendations. • Install annunciator system for each generating unit capable of providing audible and visual alarms for fault and/or engine shutdown conditions. 	Yes
Contract Modification 10 14 Feb 2013	Task iii: In consultation with DABS and USAID, connect the DPP to the medium voltage (20 kV) distribution system per Attachment 8, Diagram D-6: "KIP to DABS Single Line Diagram." In the connection, two diesel generators must share one step-up transformer. Inform the Kandahar PRT and Regional Command South (RC-S) of this activity. Incorporate this work into as-built drawings of SIPD for those portions of the plant built by the Contractor.	Yes

Source & Date	Tasks (From Prime Contract Section C.3.1.4 “Tasks”)	Completed as tasked?
Contract Modification 11 30 Sep 2013>>>	<p>Task iv: In consultation with the SIPD site owner, the Afghanistan Investment Support Agency (AISA), the Contractor must make the following facility improvements:</p> <ul style="list-style-type: none"> • Construct covered/shade area of a durable long-term structure with lighting and other permanent features for the diesel gensets. • Provide permanent installation of fuel tanks which currently have temporary installation. Permanent installation must include means for drainage/removal of water from the tanks. • Install delivery truck fuel off-loading equipment. • Construct kitchens and restroom facilities as needed for DPP staff. The Contractor must clearly present this in design submittals (Section F, B. Reports, C. Technical Reports, Design Submittals). (NOTE: THE FOLLOWING THREE TASKS ARE THE <u>MODIFICATION 11 ADDITIONS TO THE SCOPE OF WORK FOR SIPD FACILITY IMPROVEMENT.</u>) • <u>Eliminate the ability of rain/drainage water to enter the vaults by blocking off the pipeline trench leading from vault to the engine (generators).</u> • <u>Anchor (strap down) fuel tanks to the concrete vault walls as needed to prevent flotation of the tanks in the event of flooding of the vaults.</u> • <u>Submit a conceptual layout and design for installing centrifuge filtration systems at SIPD and Bagh-e-Pul (one at each location). The installation at SIPD must serve both diesel power plants located there. The Submittal must include equipment specifications and cost estimates for the installation and, to the extent practical, standardize equipment and materials-based Oil USAID’s centrifuge installation at Breshna Kot diesel power plant.</u> <p>The Contractor must begin this task after completing deliverables under Task C.3.1.4 (i).</p>	<p>Yes</p>
Contract Modification 10 14 Feb 2013	<p>Task vii: Connect the DPP to the SIP Industrial Park electrical supply grid. Using DABS labor and material to the maximum extent possible, provide electrical connection between the spare circuit breaker in the electrical switchgear in the Switchgear Room and the 20 kV feeder to Shorandam Industrial Park in accordance with Attachment 7: "SIPD Single Line 20 kv Interconnection" and as follows:</p> <ul style="list-style-type: none"> • Cabling must be underground. Use trenches where needed. • Connection must be capable of carrying full output of the DPP (approximately 6 MW). • Connect and commission the existing metering in the ABB switchgear such that electrical power exported to the SIP can be properly metered (kWh). • Install an isolating switch such that power can flow from either the DPP or the adjacent USACE facility. Parallel capabilities are not desired. • Establish and set protective relays. • Install per Section C Codes and Standards. 	<p>Yes</p>

Source & Date	Tasks (From Prime Contract Section C.3.1.4 “Tasks”)	Completed as tasked?
Contract Modification 10 14 Feb 2013	Task viii: USAID intends to transfer ownership and custody of the DPP to DABS Kandahar effective 01 January 2013. Upon transfer and following the Contracting Officer's approval, the Contractor must provide a 6 months' supply of spare parts and consumables required for sustaining the DPP, along with an associated inventory and price list submitted to the COR.	Yes
Contract Modification 10 14 Feb 2013	Task ix: Provide “on call” technical assistance to DABS for the time period of 01 January 2013 through 30 September 2013. Technical assistance will include remote and/or onsite support assistance with O&M issues, and may include labor required in support of Tasks v, vi, and vii. The Contractor must provide rapid (as quickly as secure ground movement permits) response to DABS technical assistance requests submitted to and approved by the COR. DABS will be responsible for O&M parts and supplies, beyond those provided under Task viii, as well as O&M personnel resources.	Yes
Contract Modification 10 14 Feb 2013	Task x: If requested by DABS and directed by the Contracting Officer, provide “mothball” preparation of the DPP following turnover of the DPP to DABS. If required, it is anticipated this activity would take place within 6 months of turnover in preparation for a mothball period of up to three (3) years. Mothball preparation is described in detail in the AKSA OEM Manual. The Contractor must provide mothball preparation in strict accordance with AKSA OEM requirements.	<u>No: not requested by the CO</u>
Source & Date	Deliverables (From Table F.4. A “Deliverables and Delivery Schedule” in the Prime Contract)	Document Location in Attachments
Contract Modification 10 14 Feb 2013	Deliverable 4: Functional improvements on each diesel generator unit complete. - 01 Mar 2013	d-04
Contract Modification 10 14 Feb 2013	Deliverable 6: Connect DPP to SIP industrial park electrical supply grid. - 01 Mar 2013	d-06
Contract Modification 10 14 Feb 2013	Deliverable 7: Facility improvements specified in Task C.3.1.4 (iv) completed - 100 Days after Notice to Proceed. Note: The facility improvements as referenced are those added by Modification 11.	d-07
Contract Modification 10 14 Feb 2013	Deliverable 8: Completion report submitted with as-installed single line diagrams and as-built drawings for any site modifications made under this contract. – One (1) week after completion of Deliverable 4 or 6, whichever occurs later.	d-08
Contract Modification 10 14 Feb 2013	Deliverable 11: Six (6) months' supply of spare parts and consumables along with inventory and price lists. – Due by 31 Dec 2012.	d-11
Contract Modification 11 30 Sep 2013	Deliverable 12: Conceptual layout and design for installing centrifuge filtration systems at SIPD and Bagh-e-Pohl. – Due by 15 June 2013.	d-07

2.5 Contract Deliverables

Table 4 lists the Pre-Mod 10 and 11 Deliverables applicable to Component 4 which were scheduled in the Prime Contract and achieved by the dates indicated. The Method of Verification as required by the Prime Contract is noted, as is the Attachment in which documentation of completion of each Deliverable can be found.

Table 4: Component 4 – Contract Deliverables Scheduled and Achieved Dates (Pre-Modification 10)

Deliverable	Method of Verification	Deliverable Date by Prime Contract	Achieved Date (Documentation Attachment Number)
Deliverable 1. Secure transportation of repaired and tested equipment by others from the Breshna Kot Substation to SIPD.	Site Inspections and document review	14 days following notification generators are ready for installation - 23 Jun 2011	12 Jun 2011 (d-01)
Deliverable 2. Delivery report per main unit submitted, to include nameplates and photographs.	Delivery Report	One (1) week after completion of Deliverable 1 - 27 Jun 2011	30 Jun 2011 (d-02)
Deliverable 3. Generators installed, electrically synchronized, and commissioned.	Witness of commissioning according to government approved commissioning plan.	No later than 42 days following completion of Deliverable 1 - 06 Aug 2011	04 Nov 2011 (d-03 and d-04)
Deliverable 4. DPP is connected to the medium voltage (20 KV) distribution system.	Witness of connections according to government approved plan.	14 days following completion of deliverable 3 - 28 Nov 2011	27 Nov 2011 (a-24, d-05)
Deliverable 5. Progress reports submitted, to include photographs.	Weekly Report	Weekly until completion of Deliverable 5	Weekly (a-18)
Deliverable 6. Facility improvements specified in Task C.3.1.4 (iv) completed.	Site inspections according to government approved plan.	100 Days after Notice to Proceed* - 14 Mar 2011	12 April 2012 (d-07)
Deliverable 7. Completion report submitted.	Completion Report	One (1) week after completion of Deliverable 4 or 6, whichever is later.	30 Nov 2011 (d-08)
Deliverable 8. Operation and maintenance of the DPP provided.	Site inspections and document review	From commissioning of the generator to no later than 31 Dec 2012.	31 Dec 2012 (d-09)

Deliverable	Method of Verification	Deliverable Date by Prime Contract	Achieved Date (Documentation Attachment Number)
Deliverable 9. Training Plan for DPP operations at KIP (Kandahar Industrial Park, aka SIP), KE (Kandahar East) and Breshna Kot.	Witness of government approved training plan.	30 days following Notice to Proceed* 03 Jan 2011	25 Nov 2011 (d-10)

Table 5 lists the Modification 10 and 11 Deliverables applicable to Component 4 which were scheduled in the Prime Contract and achieved by the dates indicated. The Method of Verification as required by the Prime Contract is noted, as is the Attachment in which documentation of completion of each Deliverable can be found.

Table 5: Component 4 – Contract Deliverables Scheduled and Achieved Dates (Modifications 10 and 11)

Deliverable	Method of Verification	Deliverable Date by Prime Contract	Achieved Date (Documentation Attachment Number)
Deliverable 4: Functional improvements on each diesel generator unit complete. (See Table 2 B above, Task ii for specific functional improvements to be carried out by DABS with KHPP assistance.)	Witness of completion according to government approved plan.	01 Mar 2013	18 September 2013 (d-04)
Deliverable 6: Connect DPP to SIP industrial park electrical supply grid.	Witness of connections according to government approved plan.	01 Mar 2013	22 September 2013 (d-06) (Note: Delayed due to delay in agreement for connection between USACE, DABS, and KHPP.)
Deliverable 7: Facility improvements specified in Task C.3.1.4 (iv) completed. (See Table 3 above, Task iv for specific facility improvements added by Modification 11.)	Site inspections according to government approved plan.	100 Days after Notice to Proceed – Jan 2014	03 October 2013 (d-07)
Deliverable 8: Completion report submitted <u>with as-installed single line diagrams and as-built drawings for any site modifications made under this contract (underlined text added with Modification 10).</u>	Completion Report	One week after completion of Deliverable 4 or 6, whichever is later - 08 Mar 2013	02 September 2012 (d-08) 15 June 2013 for SIPD connection to SIP (d-06)
Deliverable 11: Six months supply of spare parts and consumables <u>along with inventory and price lists.</u> (Underlined text added with Modification 10.)	Site inspection and document review.	31 Dec 2012	17 September 2013 (d-11)

Deliverable	Method of Verification	Deliverable Date by Prime Contract	Achieved Date (Documentation Attachment Number)
Deliverable 12: Conceptual layout and design for installing centrifuge filtration systems at SIPD and Bagh-e-Pohl.	Document Review	15 June 2013	05 September 2013 (d-07)

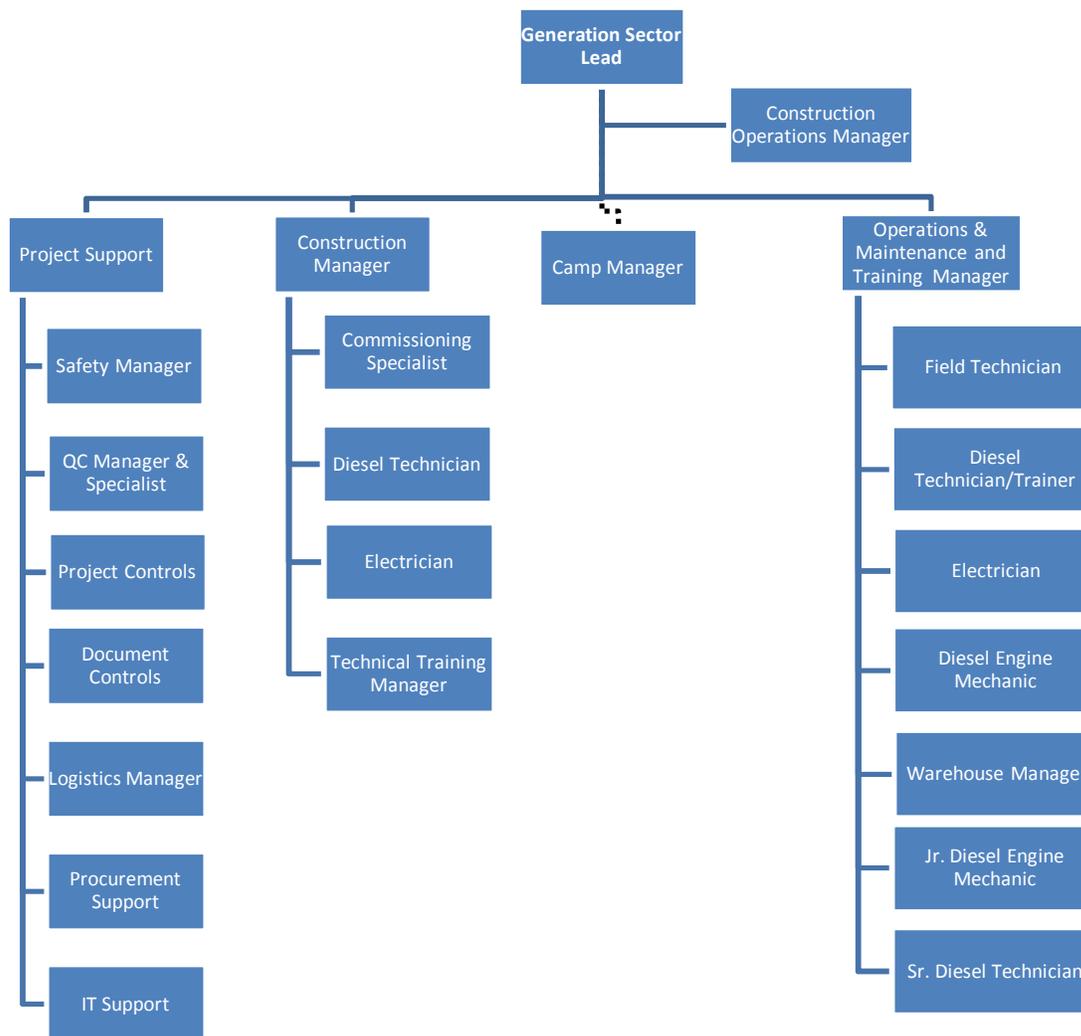
Deliverables added or amended as of Contract No. 306-C-00-11-00506-00 Modification 10 and 11

3 PROJECT EXECUTION

3.1 Organizational Structure and Management Details

Chart 1 below illustrates the organizational structure applied to the implementation of Component 4:

Chart 1: Organizational Structure of Component 4 (Reference CLIN 3 to review the entire Chain of Command for KHPP).



3.1.1 Sector Lead – Generation (John Marks, Les Zotzman, Christian Susnoschi-Luca)

The Sector Lead was based at the KHPP Project Management Organization (PMO) office located at the KHPP Regional Camp at AMTEX in Kandahar, Afghanistan, and reported to the COP. The Sector Lead made periodic visits to all KHPP generation sites, and assumed the overall responsibility for Component 4 implementation. The Sector Lead was also responsible for all related contract management, client coordination and reporting, correspondence, invoice approval, mobilization of personnel, approval of home office personnel applied to Component 4, and other project management activities in coordination with KHPP Program Management.

3.1.2 Operations and Maintenance (O&M)/Training Manager (Theo Kleinhans)

The Operations and Maintenance (O&M) Manager reported directly to the Sector Lead and was based at the Shorandam Industrial Park Camp site. The O&M Manager was responsible for the execution of the project scope of work. Additional responsibilities included implementation of DABS training for and oversight and assistance with the operation and maintenance of the facility. The O&M Manager was also responsible for budget and cost control, ensuring daily activities were in accordance with the O&M Project Implementation Plan, and the coordination of the work effort with KHPP Program Management resources.

3.1.3 Construction Manager (Theo Kleinhans, Jamal Yassien)

The Construction Manager reported directly to the Generation Sector Lead and was based at the Shorandam Camp during the installation and commissioning period. The Construction Manager was responsible for the execution of the generation station installation and commissioning, including design and construction and complying with contract scope and schedule. Additional responsibilities included: (1) development of the training plan and achieving USAID approval of the plan and implementing the DABS training, (2) providing oversight and assistance in the operation and maintenance of the facility during construction, (3) budget and cost control, (4) ensuring daily activities were documented and reported in accordance with the Project Implementation Plan, and (5) coordinating the work effort with input from KHPP Program Management resources.

3.1.4 Construction Operations Manager (COM) (Howard Wakefield, Michael Tennyson)

The Construction Operations Manager COM was responsible for coordination of the generating station design and construction on the project. The COM coordinated compliance with the schedule, safety, cost, and quality decisions in conjunction with the Project Construction Manager. The COM reported to the COP.

3.1.5 Camp Manager (Dirk Van Straten)

The Camp Manager reported to the KHPP Life Support and Air Operations Manager and was based at the KHPP Base Camp located at AMTEX in Kandahar, Afghanistan. The Camp Manager was responsible for ensuring provision and quality control of all life support functions at the project site.

3.1.6 Program Quality Control (QC/QA) Manager (Ross Reyes)

The Program Quality Control/Quality Assurance (QC/QA) Manager implemented and maintained the project quality plans and procedures as filed with and approved by USAID. The QC/QC Manager was based at the KHPP Base Camp, although the QC/QA Manager traveled frequently to the sites. Reporting to the COM, the QC/QA Manager served as the quality control and assurance interface between project sites, procurement and material inspections, the program office, and assigned Subcontractors/suppliers.

3.1.7 Warehouse Manager (Willem Castelyn)

The Warehouse Manager reported to the O&M Manager and was based at the Shorandam Industrial Park site. The Warehouse Manager was responsible for site logistics and inventory management and training of DABS staff in Warehouse Management. The Warehouse Manager coordinated with the Program Management team, local DABS officials, and SIPD staff relative to the above activities.

3.1.8 Field Technician (Phaibun Mongkhonkun, Frederick Kangethe Chege, Boniface Murila)

The Field Technician reported to the O&M/Training Manager and performed O&M functions in addition to training of DABS staff. The technician was based at Shorandam Camp.

3.1.9 Diesel Technician and Trainer (Stephen Ndili)

The Diesel Technicians and Trainers based at Shorandam Camp were responsible for oversight of diesel installation, and reported to the Construction Manager during construction and commissioning. Following Plant commissioning, the Diesel Technicians reported to the O&M Manger and assisted in both O&M and in intensive training of DABS staff.

3.1.10 In-country Program Management Support Resources

In-county Program Management Organization (PMO) resources include: Program Management, Finance, Contracts-Procurement-Compliance, Logistics, Security, Health & Safety, Environmental, Reporting, Quality Control, Project Controls, Document Controls and Human Resources. The PMO team was located at AMTEX in Kandahar, Afghanistan, and made periodic visits to KHPP sites on an as-needed basis. The primary responsibilities of the PMO were to provide functional support to all Components in accordance with approved

Implementation Plans, KHPP Program, BVSPC Corporate, and USAID established policies and procedures.

3.1.11 Home Office Program Management Resources

Home Office resources performed project support throughout the duration of the project. In addition, the field PMO performed all accounting functions and monthly operational and financial reviews of the Project in coordination with their counterparts at the BVSPC Federal Services Division Headquarters in Overland Park, Kansas, USA.

3.2 Implementation of Work

In December of 2010, USAID awarded BVSPC Contract No. 306-C-00-11-00506-00 to perform the Kandahar Power Initiative (later re-named Kandahar Helmand Power Project, or KHPP), and immediately began executing activities under Component 4. At the inception of the KHPP, USAID coordinated the relationship with DABS Kabul to maintain communication and reporting of KHPP activity and progress. BVSPC maintained communication and reporting of KHPP field activity with the Kandahar DABS Director. BVSPC continued to coordinate and maintain liaison with Kandahar DABS, as well as RC-S and RC-SW and the USAID Onsite Managers (OSM) working directly with DABS in Kandahar and Helmand Provinces, throughout the implementation of the KHPP. The OSM reported to the COR. The Construction Manager and the O&M Manager worked directly with their counterparts in Kandahar DABS, and communicated mutual needs and concerns. The working relationships between KHPP staff and the Kandahar DABS Director, senior managers, and staff were consistently positive and productive.

USAID provided consent to BVSPC in March 2011 to proceed with a subcontract under Component 4 with Power Generation Solutions (PGS), a Dubai-based organization, for the installation and commissioning of the ten (10) SIPD AKSA manufactured diesel generators (see Section 3.3 for detailed information on this subcontract).

Task i: *Provide secure acceptance site and transport, as required, of repaired and tested equipment to be installed and commissioned at SIPD. Equipment includes:*

- *Ten (10) AKSA manufactured diesel generators, rated at 800 Prime KVA each.*
- *Five (5) step-up 0.4/20 KV transformers rated at 1,700 KVA.*
- *One (1) step-down 20/0.4 KV transformer rated at 630 KVA, and associated accessories.*

Status: COMPLETE

The ten (10) ASKA 800 KVA generating units were sent from Kabul, where they had been taken for repair, and arrived at the Shorandam Industrial Park (SIP) on 09 June 2011. The generators were formally received and inspected by the BVSPC QC Manager at the SIPD site on 12 June 2011. The convoy experienced incoming small arms fire during the transport of the units from Kabul to Kandahar. Generator 1 was struck three times, resulting in cosmetic damage to the container. Generator 5 was hit two times, resulting in cosmetic damage and one bullet penetrating the generator day tank, which was patch welded and inspected prior to use. The Generator Delivery Report with nameplate photos can be found in **Attachment d-01**.

Procurement of five (5) step-up 0.4/20 KV transformers rated at 1,700 KVA and one (1) step-down 20/0.4 KV transformer rated at 630 KVA, including associated accessories, was ordered on 31 March 2011. New equipment procurement was required as a result of irreparable damage sustained during the previously mentioned bombing in Kandahar (see Section 2.2). The new transformers were received and placed on slabs by 18 September 2011.

PGS, with oversight from the KHPP Generation Manager and other KHPP staff as indicated above in Chart 1, installed and commissioned the SIP Diesel Plant (SIPD) and turned over the plant to KHPP on 07 November 2011. SIPD was connected to the Kandahar distribution grid supplying Feeder 514. This action concluded all activities associated with Task i.

Task ii: *(As modified under Contract Modification 10, 14 February 2013) Install (including additional civil work as required to the existing power plant site as provided by USAID), electrically synchronize, and commission the generators. Carry out the following functional improvements to each diesel generator unit, utilizing DABS labor to the maximum extent possible:*

- Install oil sump temperature monitoring devices in unused oil pan plugs in accordance with manufacturer requirements.
- Install bypass oil filtration in accordance with manufacturer recommendations.
- Install annunciator system for each generating unit capable of providing audible and visual alarms for fault and/or engine shutdown conditions.

Status: COMPLETE

All Pre-Mod 10 activities pertaining to SIPD installation, including material procurement, design and construction of the installation, electrical synchronization, and commissioning of the ten (10) ASKA manufactured diesel generators, commenced March 2011 and ended November 2011 with the Subcontractor Substantial Completion and Handover to BVSPC. As part of the commissioning process, all generators were performance tested using a load bank. The Installation included additional civil works to the existing power plant site as required. (Refer to **Attachments a-20** through **a-24** and **d-03**, **d-04** and **d-**

08 for pre-Mod 10 and 11 Tasks and Deliverables documentation.) Under Modification 10 direction from USAID, the following functional improvements were executed to each diesel generator unit using DABS labor to the maximum extent possible: (1) installation of bypass oil filtration in accordance with manufacturer recommendations, and (2) installation of an annunciator system for each generating unit capable of providing audible and visual alarms for fault and/or engine shutdown conditions. (Refer to **Attachments d-04** and **d-07** for documentation of USAID inspections and awards of Substantial Completion confirming implementation of these Tasks in addition to the referenced Attachments email confirmations of completion between USAID and BVSPC.)

In addition, BVSPC completed the installation of oil sump temperature monitoring devices in unused oil pan plugs in accordance with manufacturer requirements. This task was implemented under Modification 10. BVSPC completed the installation of two (2) of ten (10) oil sump temperature monitoring systems while simultaneously training DABS staff in the process. The systems are composed of a temperature sensor on the generator, a control cable, and a controller on the generator main control panel. The control cable and the sensors on the remaining eight (8) systems and the eight (8) remaining controllers were turned over to DABS for installation, which DABS completed with oversight from BVSPC staff.

Task iii: *(As modified under Contract Modification 10, 14 Feb 2013) In consultation with DABS and USAID, connect the DPP to the medium voltage (20 kV) distribution system per Attachment 8, Diagram D-6: KIP to DABS Single Line Diagram. In the connection, two diesel generators must share one step-up transformer. Inform the Kandahar PRT and Regional Command South (RC-S) of this activity. Incorporate this work into as-built drawings of SIPD for those portions of the plant built by the Contractor.*

Status: COMPLETE

BVSPC, in consultation with DABS and USAID, connected the DPP to the medium voltage (20 kV) distribution system per Diagram D-6: KIP to DABS Single Line Diagram. Construction of the 20 kV line began in January 2012, and was energized in May 2012. Two diesel generators shared one step-up transformer in the connection. The Kandahar PRT and Regional Command South (RC-S) were informed of this activity. This work was incorporated into SIPD as-built drawings; documentation can be found in **Attachment a-24**. This connection reflected Modification 6 direction to connect the plant to Kandahar City Feeder 514 South (Airport Feeder) and not to the “No Drug Mountain” distribution as originally indicated by the contract. The No Drug Mountain feeder served businesses in the area but, in 2011, had less than 1 MW of load. However, Feeder 514 South was more readily connected, served a combination of commercial and residential customers and, with an average load three times that of No Drug Mountain, was a more effective use of SIPD capacity. This connection also relieved load on the Big SIP plant which was approaching or exceeding maximum capacity during peak load periods.

This completed all activities associated with Task iii.

Task iv: *In consultation with the SIPD site owner, the Afghanistan Investment Support Agency (AISA), the Contractor must make the following facility improvements (Pre-Mod 10 and 11 subtasks unless noted):*

- *Increase the height of security walls or construct new as needed.*
- *Construct covered/shade area of a durable long-term structure with lighting and other permanent features for the diesel gensets.*
- *Provide permanent installation of fuel tanks which currently have temporary installation. Permanent installation must include means for drainage/removal of water from the tanks (drainage capability – Mod 10).*
- *Install delivery truck fuel off-loading equipment.*
- *Construct kitchens and restroom facilities as needed for DPP staff. The Contractor must clearly present this in design submittals (Section F, B. Reports, C. Technical Reports, Design Submittals).*
- *Eliminate the ability of rain/drainage water to enter the vaults by blocking off the pipeline trench leading from vault to the engine (subtask added under Mod 11).*
- *Anchor (strap down) fuel tanks to the concrete vault walls as needed to prevent flotation of the tanks in the event of flooding of the vaults (subtask added under Mod 11).*
- *Submit a conceptual layout and design for installing centrifuge fuel filtration systems at SIPD and Bagh-e-Pul (one at each location). The installation at SIPD must serve both diesel power plants located there. The Submittal must include equipment specifications and cost estimates for the installation, and, to the extent practical, must standardize equipment and materials based on USAID's centrifuge installation at Breshna Kot diesel power plant." (Subtask added under Mod 11.)*

Status: COMPLETE

In consultation with the SIPD site owner, AISA, the facility improvements required by the Prime Contract were implemented. As-built/As-recorded drawings with facility improvements incorporated are located in **Attachments a-20** through **a-24** and **d-03**, **d-04** and **d-08**.

The US Army increased the security perimeter when they assumed control of the majority of the SIP site. Their action as agreed between USAID and BVSPC eliminated the need for BVSPC to address the security wall height or additions. BVSPC oversaw the construction of a covered/shade area of a durable long-term structure with lighting for the diesel generator station. Permanent below grade installation of fuel tanks was provided in tank cradles; however, the tanks were not initially designed to be restrained against uplift. During the unexpected flash flood event described in Section 2.3, the tanks became buoyant, resulting in damaged tank covers, conduit, and hoses (refer to **Attachment d-07**, file folder Pre-Modifications 10 and 11, subfolder SIPD Flood, for a complete assessment and response to the SIPD flood).

Repairs were conducted and the tanks were strapped down to prevent future problems and damage. In undertaking the repairs, DABS and BVSPC staff drained and cleaned the fuel tanks to eliminate any debris in the tanks and removed all water in the fuel delivered. As indicated in Section 2.3, it was determined that drainage capability for the site was disrupted by the installation of T-walls for security protection by ISAF, with drainage blocked to prevent a security breach. It was also determined by USAID, as recommended by BVSPC, that the drainage/removal of water from the tank vaults would best be conducted by DABS using mobile gasoline powered pumps provided to DABS by USAID. (Refer to **Attachment d-07**, file folder Pre-Mod 10 and 11 for confirmation email from USAID.)

A delivery truck fuel off-loading pad was built at SIPD next to the below grade bulk storage tanks. Following handover of SIPD on 31 December 2012, DABS requested a proposal to build an off-load pad outside the SIPD base; however, this was not part of the deliverable under this contract, and was declined by USAID.

Kitchen facilities were not built prior to 2013, as the US Army provided Difac access to BVSPC staff to avoid the need for additional personnel and deliveries into the site. A kitchen and restroom facilities were needed when the site was transferred to DABS. For the kitchen and restroom facilities, it was agreed between DABS, BVSPC, and USAID that it would be most cost effective to convert two available Government Furnished Equipment (GFE) containers which had been conveyed to BVSPC to a kitchen and restroom facility for DABS SIP staff. The retrofit of these containers to meet the objectives of providing a kitchen and restroom facility was completed in July 2013. (Refer to **Attachment d-07**, file folder Pre-Mod 10: Task iv Deliverables, which provides documentation of the kitchen and rest facilities construction.) Note: The Final Inspection and Substantial Completion Certificate as provided by USAID confirmed the Task was completed. These containers were also used for the BVSPC “on call” O&M staff associated with Task ix, and were conveyed to DABS SIPD following concurrence from USAID for the disposition of this property.

A conceptual layout and design for installing a centrifuge fuel filtration systems at SIPD and Bagh-e-Pul were developed as tasked and provided to USAID on 20 May 2013. (Refer to **Attachment d-12** for the Centrifuge Proposal.) Following review and discussions with DABS, USAID opted to table the implementation.

Task v: *Provide operation and maintenance of the DPP. The operation and maintenance must start on the day on which deliverables under Task C.3 .104 (ii) are accepted.*

Status: COMPLETE

Site security at SIPD was provided by the US Military assigned to the USACE SIP “Big SIP” plant co-located at Shorandam for the duration of this project. O&M of SIPD “Little SIP” commenced following commissioning of the diesel generators and ended on 31

December 2012. O&M was conducted in conjunction with DABS staff training, and was executed in accordance with the approved **Operation and Maintenance Project Execution Plan (Attachment a-03)** and applicable **Operation and Maintenance Manuals (Attachment a-11)**. This completed all activities associated with Task v.

A major event occurred damaged the injectors for the majority of the diesel generating units during the initial O&M period by BVSPC staff. Several injectors seized, causing the push rods to buckle. This event was ultimately traced to probable fuel contamination, although residue from the extended layup period from 2009 to 2011 could have also contributed to injector failures. Residue testing as to source of the problem was inconclusive. The event led to the plant being taken off-line from February 2012 to 19 August 2012 for repair and replacement of injectors, valves, and push rods damaged by the event. (**Attachment a-26** provides the SIPD Fuel Injector Failure Report). Top fuel enhanced testing and scrutiny of fuel procurement sources was undertaken to prevent a repeat event.

Task vi: *Provide capacity development activity by training of the local Da Afghanistan Breshna Sherkat (DABS) and/or AISA staff in the operation and maintenance requirements of the DPP.*

Status: COMPLETE

BVSPC implemented the **SIPD O&M Training Execution Plan** (refer to Attachment d-10: Sustainability Report, which includes the SIPD O&M Training Execution Plan), which was submitted to USAID in February 2012. The Training Execution Plan established the methodology of providing capacity development to the local DABS staff in the O&M requirements of the SIPD. In addition, Attachment d-10 includes a copy of an email between USAID and BVSPC which confirms DABS concurrence to assign sufficient numbers of suitable qualified personnel to participate in the SIPD training. USAID and BVSPC emphasized to DABS their commitment was critical to the successful O&M and sustainment of SIPD post 31 December 2012 (plant handover).

For high speed diesel plants such as SIPD which may be operated 24 x 7, the shift requirements usually dictate no fewer than eleven (11) staff on rotating shifts. DABS provided four trainees for the O&M training on 20 May 2012; however, the four (4) trainees were reduced to two (2) by the end of June 2012. This reduction was due to two (2) trainees being reassigned to other DABS-operated power plants. In early August 2012, DABS assigned three (3) additional trainees to SIPD, increasing the number to five (5) trainees in total. BVSPC and USAID made repeated requests to DABS, both in Kandahar and in Kabul, to provide a more adequate number of trainees. Training continued with these five (5) trainees, 3 days a week, until 04 November 2012 when nine (9) additional DABS trainees arrived at SIPD, bringing the total to thirteen (13) DABS trainees (one DABS trainee left the project).

The O&M training for DABS Kandahar staff was scheduled to end on 30 Nov 2012. O&M training classes commenced for all 13 trainees as a group on 04 Nov 2012, and continued through 07 November 2012. On 08 November 2012, the new trainees (nine in total) went absent, and it was conveyed they had to report to the DABS regional office in Kandahar City to be vetted. BVSPC O&M training instructors needed these DABS members to participate in the BVSPC Training Program to ensure the skills, knowledge and abilities required to successfully operate and maintain the plant were achieved before a planned trial O&M period starting 01 December 2012. This one (1) month trial period would afford DABS the opportunity to take charge of SIPD operation while still maintaining the benefit of BVSPC trainers and operators onsite for over-watch and troubleshooting assistance.

The nine (9) new trainees returned to SIPD on 25 November 2012. Theoretical O&M lessons continued until 02 December 2012, at which time trainers placed greater emphasis on practical and On-the-Job Training (OJT) with the intent to provide the DABS trainees with the intensive practical experience and confidence necessary to operate and maintain the power plant following SIPD handover. All thirteen (13) trainees continued this intensive training for the month of December 2012, completing the trial period under the supervision of BVSPC trainers and operators.

The most effective teaching technique was found to be the hands-on demonstration of concepts and techniques, followed by allowing the trainees time and materials to practice those newly-acquired techniques under the close supervision of BVSPC staff onsite. The hands-on experience they received was detailed under the O&M Activities section of the daily and weekly SIPD O&M Reports (refer to **Attachment d-09**).

The DABS staff was evaluated on strength of knowledge and skills following completion of the training, and were divided into four shifts to cover the SIPD operations 24 x 7 to the best of their abilities. The 24 hour shifts were recommended (08:00 AM to 08:00 AM) for security purposes (to limit movement and access and egress from the ISAF controlled site) and to ensure that once the DABS members arrived at SIPD for their shift, they would have to remain at SIPD and operate the plant until the next shift arrived to release them. The total weekly working hours per worker was considered, with the intent to keep the working hours within a 46 to 48 hour work week per trainee.

This completed all activities associated with Task vi. All supporting O&M Training documentation can be found in **Attachment a-25**. Effective 31 December 2012, DABS assumed control of the SIPD, and USAID provided the Final Acceptance and Completion Certificate for Pre-Modification 10 with an effective date of 31 December 2012. As of this date, BVSPC removed all staff from the SIPD site, and DABS had full responsibility to operate and maintain SIPD (see **Attachment m-01b**).

Task vii: *(Added under Modification 10, 14 February 2013) Connect the DPP to the SIPD Industrial Park electrical supply grid. Utilizing DABS labor and material to the*

maximum extent possible, provide electrical connection between the spare circuit breaker in the electrical switchgear in the Switchgear Room and the 20 kV feeder to Shorandam Industrial Park in accordance with Attachment 7: SIPD Single Line 20 kv Interconnection and as follows:

- *Cabling must be underground. Use trenches where needed.*
- *Connection must be capable of carrying full output of the DPP (approximately 6 MW).*
- *Connect and commission the existing metering in the ABB switchgear such that electrical power exported to the SIPD can be properly metered (kWh).*
- *Install an isolating switch such that power can flow from either the DPP or the adjacent USACE facility. Paralleling capabilities are not desired.*
- *Establish and set protective relays.*
- *Install per Section C Codes and Standards.*

Status: COMPLETE

BVSPC provided DABS all technical requirements to connect the DPP to the Shorandam Industrial Park electrical supply grid. With BVSPC assistance and quality control oversight and, using DABS labor and material, an electrical connection between the spare circuit breaker in the electrical switchgear in the Switchgear Room and the 20 kV feeder to Shorandam Industrial Park was made in accordance with "SIPD Single Line 20 kv Interconnection."

Cabling was placed underground using trenches as needed. DABS Management supplied the labor and delivered the cable for the completion of this task. However, it was later determined that, for power dispatch coordination purposes, USACE did not wish for the connection to be completed until DABS assumed control of "Big SIP" in December 2013. (As noted previously, USACE had contracted AIP to build and operate a 10 MW bridging diesel power plant at SIP adjacent to the previously contracted AKSA "Little SIPD" 6.5 MW plant.) Therefore, all equipment was installed and, to the extent possible, made ready for DABS to complete the task once DABS assumed control of Big SIP. Refer to **Attachment d-06** for design and installation information and **Attachment a-09** for photos.

This connection enabled DABS to supply power from SIPD to the SIP and "New Industrial Park" business communities as a separate islanded 20 kV distribution system, independent of the City's distribution system.

Task viii: *(Added under Modification 10) USAID intends to transfer ownership and custody of the DPP to DABS Kandahar effective 01 January 2013. Upon transfer and following the Contracting Officer's approval, the Contractor must provide six (6) months' supply of spare parts and consumables required for sustaining the DPP, along with an associated inventory and price list submitted to the COR.*

Status: COMPLETE

Per Implementation Letter No. 46, USAID transferred ownership and custody of the DPP to DABS Kandahar effective 31 December 2013. BVSPC, with the Contracting Officer's approval, provided a six (6) months' supply of spare parts and consumables required for sustaining SIPD, along with an associated inventory and price list submitted to the COR. All testing, commissioning, and handover documentation can be found in **Attachment m-01a**. Documentation of the provision of six (6) months' supply of spare parts, consumables, and tools can be found in **Attachment d-11**.

The six (6) months' supply of spare parts and consumables were turned over to the DABS Warehouse Manager on 14 and 15 September 2013. The DABS Warehouse Manager had previously received training in Warehouse Management from BVSPC's Warehouse Manager. This completed all activities associated with Task viii.

Task ix: *(Added under Modification 10, 14 February 2013) Provide "on call" technical assistance to DABS for the time period 01 January 2013 through 30 September 2013. Technical assistance will include remote and/or onsite support assistance with operations and maintenance (O&M) issues, and may include labor required in support of Tasks v, vi, and vii. The Contractor must provide rapid (as quickly as secure ground movement permitted) response to DABS technical assistance requests submitted to and approved by the COR. DABS will be responsible for O&M parts and supplies beyond those provided under Task viii, as well as O&M personnel resources.*

Status: COMPLETE

BVSPC provided on-call technical assistance to DABS for the time period 01 January 2013 through 30 September 2013, using KHPP staff assigned to BK MTU plant O&M. The technical assistance included remote and onsite support assistance with O&M and troubleshooting issues. BVSPC provided rapid (as quickly as secure ground movement permitted) response to DABS technical assistance requests submitted to and approved by the COR. During this period, DABS was responsible for O&M parts and supplies beyond those provided under Task viii, but not yet consumed, as well as O&M personnel.

Site events requiring significant technical assistance as requested by and in cooperation with DABS Kandahar during this task included the following:

- Assessing damage and overseeing repair of the SIPD engines. The damage was due to fuel management issues as noted under Section 2.3 above.
- Assessing the flood damage noted under Section 2.3 above, and recommending repairs and preventive actions to minimize the risk of a repeat event having the same impact.
- Reprogramming the control modules in a number of the SIPD generators.

- Reviewing the design for and installation of the interconnection between SIPD and the SIP. Assistance included specification and procurement of materials installed by DABS.
- Providing additional onsite training to new DABS staff sent to perform the O&M for the SIPD.

Following applicable inspections by USAID, USAID issued a Final Completion and Acceptance Certificate for all Post-Mod 10 deliverables on 12 January 2014. The delay in Certificate issuance was due to the time needed to document all Post-Mod 10 deliverables.

Task x: *(Added under Modification 10) If requested by DABS and directed by the Contracting Officer, provide “mothball” preparation of the DPP following turnover of the DPP to DABS. If required, it is anticipated this activity would take place within six (6) months of turnover in preparation for a “mothball” period of up to three (3) years. “Mothball” preparation is described in detail in the AKSA OEM manual. The Contractor must provide “mothball” preparation in strict accordance with AKSA OEM requirements.*

Status: NOT REQUESTED

DABS did not request “mothball” preparation, nor did the Contracting Officer direct BVSPC to provide mothball preparation of the DPP following turnover of the DPP to DABS.

3.3 Subcontracts and Major Procurements

A summary of major subcontracts and major procurements undertaken to complete Component 4 are described below. Refer to **Attachment c-05** for a matrix of all subcontracts and procurements used to complete Component 4.

PGS Subcontract:

Power Generation Solutions (PGS) performed the major subcontracted elements of work for Component 4. PGS had performed the repair work on the SIPD diesel gensets and housings in Kabul under the AIRP. PGS followed this work with an unsolicited proposal to: (1) install the plant inclusive of all required civil and electrical work, and (2) procure equipment which had been destroyed by the bombing in Kandahar. BVSPC reviewed the proposal, and performed an independent cost estimate, thus determining the PGS offer was priced reasonably and cost effective, given that PGS had repaired the equipment and would then be responsible for installation and commissioning. BVSPC developed its recommendation into a Request for Consent on a sole source basis to USAID. On 24 March 2011, after receiving USAID consent, BVSPC issued a Firm Fixed Price Subcontract to PGS for [REDACTED], which was subsequently amended three times as described below.

The scope of work for the subcontract consisted of the following:

Although the site had already been partially prepared for the installation of the power plant, a number of the elements of the installation remained incomplete. As the project was integrating prior work performed by others before work commenced, PGS conducted a full site inspection of works and provided a report of the current state to ensure a clear base line.

The elements remaining to be completed were as follows:

1. The installation of pipe work from the main fuel tanks to the gensets.
2. The installation of LV and MV cable and termination of such at the gensets, transformers, and switchgear. The above items were held in storage as a part of the previous GFE transferred to KHPP from the AIRP, and were provided promptly to PGS on commencement of work at the site.
3. The provision of “like for like” replacement of the existing transformers with new equipment with the same specifications.
4. The removal and re-installation of covers on the cable and pipe trenches.
5. The completion of the Switchgear Building.
6. Installation of the gensets, switchgear, and transformers.
7. The commissioning and full load testing of all plant equipment and handover to B&V.
8. The provision and installation of dual fuel distribution pumps mounted on a skid with controls (min flow 100 LPM).
9. The design, provision, and installation of a steel pitched roof capable of retaining local snow loads and winds of 100 miles per hour to offer protection to the plant and personnel throughout the generator area. This roof was erected after the plant was online as material delivery times were extended.

During the performance of this Subcontract, BVSPC was responsible for monitoring the Subcontractor’s work in accordance with the subcontract and for installing and commissioning the SIPD plant in accordance with BVSPC’s prime contract. PGS and BVSPC cooperated to: (1) review and monitor schedules and milestone dates established by PGS and reported these in PGS’s monthly progress report; (2) monitor PGS performance to ensure negotiated technical specifications were complied with and all obligations were met; (3) review critical shop drawings, documents, and reports as appropriate; (4) review main design criteria and parameters, concepts, techniques, and procedures provided by PGS; and (5) witness shop tests of major equipment.

In addition, PGS’s scope of services included, but was not limited to, the following items:

1. Project management, including project administration, project coordination, scheduling, estimating, and reporting.
2. Engineering services included, but were not limited to, the following: project scheduling, detailed design, procurement and expediting of all equipment,

materials, and supplies, delivery of equipment and materials to Delivery Address, design documentation, and submittal of Subcontractor-generated documents for compliance review.

3. Quality Assurance/Quality Control (QA/QC), spare parts control and inventory, assembly, O&M Manuals and instructions, reconciliation with custom authorities in case of foreign Subcontractors, complete design engineering documentation, engineering completion, "Conformed to fabrication records" (as-built) drawings, participation in meetings as requested by the BVSPC, training and instruction of BVSPC's Representative in the operation, maintenance, long-term storage requirements, and repair of the equipment. The "as-built" or final drawings were limited to the work performed by PGS. Final drawings of the civil works which were largely inherited by BVSPC were not provided nor available when requested.

Amendment 1:

A no-cost change order was issued to PGS on 20 July 2011 to provide 0.4/20 kV step-up transformer units within four (4) weeks in order to meet the existing delivery schedule. Two transformers delivered to the site by PGS were damaged in transit during the execution of the project. These transformers were 1,700 kVA units, which would have required more than 12 weeks to re-acquire and would have greatly extended the schedule. PGS provided the transformers as needed to meet schedule.

Amendment 2:

On the 25 August 2011, BVSPC amended the contract with PGS for [REDACTED], increasing the contract value to [REDACTED]. The Request for Consent to modify the PGS contract was approved by USAID on 09 July 2011. The RFC included [REDACTED] in expected contract modifications with PGS, and [REDACTED] to account for the additional cost incurred by BVSPC to manage the additional activity. The additional cost incurred by BVSPC was accounted for separately in order to maintain the integrity of the CLIN specific budget. Of the [REDACTED] in requested and USAID approved PGS contract modifications, an additional engineering review resulted in the changes being reduced in value to [REDACTED] by eliminating the addition of a black start diesel and automatic switch. The elimination resulted in a savings of [REDACTED] without reducing the reliability of the SIPD, which could get black start power from the adjacent Big SIP plant. The final contract amendment included the following additional scope:

1. Manufacture and install new cable and pipe trench covers, using reinforced 3,500 PSI concrete with lifting lugs.
2. The existing generator set pads were too small for the units to be installed. This amendment included excavation alongside the existing pads down 600 mm and then compaction of the sub-base and placement of 300 mm of compacted crushed aggregate. Drilling was done horizontally into the existing pads at 600 mm centers and welding of rebar was performed to tie the new pad to the old

- pad. Once the rebar was in place, the placement of reinforcement mesh and placement of 3,500 psi concrete to a depth of 300 mm was completed.
3. Install a new fuel storage/delivery system, including: replacement of eight (8) concrete slabs with new concrete slabs made to fit over the fuel tank turret with better aligned access hatches; pressure testing all fuel tanks to 2 psi; installation of new fuel feeds to the “Big SIP” fuel farm 80 meters underground, including one (1) road crossing; installation of four (4) sump pumps; provide new distribution pipe work; and provide new pump and filter systems in-line with those already in place.
 4. Fabricate and install 90 meters of replacement cable tray.
 5. Provide 150 LV termination kits and 22 MV termination kits.
 6. Design, procure, and install split system heating, ventilation and air conditioning (HVAC) for the Switchgear Building.
 7. Installation of a new battery rack.

The need for this Amendment was driven by a lack of design documentation on the inherited site and poor assumptions during initial site assessments on the adequacy of prior civil work and materials on hand. Although the site was assessed prior to proceeding with PGS, it was not until the equipment was delivered and the installation begun that the misalignments and needs were discovered.

Amendment 3:

On 27 September 2011, BVSPC amended the contract with PGS for [REDACTED], increasing the contract value to [REDACTED]. The amendment included the following additional scope:

1. Provide all labor, materials, and equipment required to restore the damaged fence on the southern and western perimeter. The fence was to be erected 2.5 meters high with a role of concertina wire on top. In addition, replace the gates with a width of 6 meters to allow access for cranes and other heavy vehicles.
2. Procure 35 meters of cable to complete the LV connections.
3. Provide all labor, material, and equipment required to install checkered steel plate over open trenches in the Switchgear Building.
4. Provide all labor, material, and equipment required to install a 20 KV feeder and terminate equipment from the switchgear to a pole to be erected onsite. The location is approximately 90 meters from the switchgear position.
5. As part of installation, PGS shall dig the trench, place a sand bed, place the cable, fill around the cable with sand, and compact 6 feet of earth on top. PGS shall then install a concrete cover of 4 inches of lean mix with a warning tape over the cable. PGS shall terminate and test the cable in the switchgear and on equipment to be provided by B&V on the pole. B&V will also provide and install the pole, as well as protect the cable on the pole with a metal capping 7 feet aboveground.

6. Provide all labor, material, and equipment required to install a layer of gravel between 4 and 8 inches (depending on site level variation) around the main power site to include the Switchgear Room, generator sets, transformers, and the fuel farm. This area is approximately 40 by 70 meters. The gravel shall be retained on one side by either curbs or timber edging.

The following table extraction provides the major milestones and payment schedule applicable to the PGS contract for SIPD:

CLIN	DESCRIPTION	QTY	U/I	AMOUNT
0001	Mobilize Staff & Equipment	1	Job	
0002	Site Survey, Inspection and Develop Base Line	1	Job	
0003	Install pipe work from the main fuel tanks to the GENSETS	1	Job	
0004	Make Permanent Installation of Fuel Tanks	1	Job	
0005	Provide and Install Replacement Transformers	1	Job	
0006	Install LV and MV Cable and Terminate at GENSETS, Transformers and Switchgear	1	Job	
0007	Provide and Install Fuel Distribution Skid and Controls (dual)	1	Job	
0008	Provide and Install a Durable Long Term Shade/Cover Over the GENSETS	1	Job	
0009	Completion Construction of the Switch Gear Building	1	Job	
0010	Installation of the GENSETS, Switchgear and Transformers	1	Job	
0011	Provision and Installation of Internet Connection	1	Job	
0012	Commissioning and Full Load Testing	1	Job	
0013	Shipping & Logistics (including Airfreight on Transformers & Pumps)	1	Job	
0014	DBA Insurance	1	Ea	
0015	Insurance	1	Ea	
TOTAL AMOUNT				

BVSPC conducted a final inspection of works provided by PGS and identified all punch list items as complete (**Attachment m-01a**) on 07 November 2011. All as-built drawings (**Attachment a-24**) for work conducted by PGS are attached. The Subcontract and Procurement (**Attachment c-05**) Matrix identifies all subcontracts and procurements performed under Component 4 SIPD.

3.4 Budget and Expenditures

A summary of the Component 4 estimated cost (revised as of Contract Modification 13) and costs billed through 25 July 2014 (as reflected in Invoice 105), is provided in Table 6 below:

Table 6: Component 4 – Financial Summary

Cost Report	Estimated Cost (Modification 13)	Costs Billed thru 25 July 2014	Remaining Budget
TOTAL COST (Including Fee)	██████████	██████████	██

3.5 Government Property Summary

USAID issued Implementation Letter No. 46-02 on 27 December 2012, which transferred SIPD to the care and custody of DABS. (Refer to **Attachment d-06b**, SIPD Handover in English and Dari.) Final Disposition Instructions for property other than contract deliverables, which included accommodation units and other equipment as listed in **Attachment d-06a**, were implemented on 13 September 2013 (OAA-13-P-0243). Handover/Disposal Documents for six (6) months' of spare parts and consumables (**Attachments d-11 and g-07b**) were signed by DABS personnel on 12 February 2013.

3.6 Final Schedule

Refer to **Attachment a-08** for copy of the schedule applicable to Component 4.

4 PROJECT PHYSICAL COMPLETION

4.1 Documentation of Completion

As indicted in Section 2.2: History, the completion of Component 4 occurred in two phases. During the Pre-Mod 10 phase, the actual physical completion of the installation and commissioning of SIPD occurred upon handover from PGS to BVSPC on 07 November 2011. Engine control problems arose with Diesel Generator Set No. 1 following handover to BVSPC, and the set remained off-line until a required replacement part could be obtained. The engines were operated infrequently during the month of November and the first part of December 2011; six (6) out of the ten (10) generators were running for power export 24 x 7 on 13 December 2011.

The plant operated as required until 13 February 2012, when the injector failures noted above arose. Refer to **Attachment a-26** for a detailed report on the failure of the fuel injectors and the actions taken to correct the problem and ensure it did not reoccur. The root of the failures was determined to be foul fuel which kept the SIPD off-line until 30 July 2012. The failure required the units to be extensively repaired, with replacement of injectors and bent push rods. The extensive damage was repaired and adjustments were made to the fuel delivery filters; the plant was back online on 30 July 2012, as noted. SIPD was operated and supplied power to the DABS grid from 20 July 2012 until 30 December 2012.

As indicated within Section 2, the Post-Mod 1 phase began in February 2013. Tasks and Deliverables completion within the Post-Mod 10 phase are addressed within Section 3.2.

Refer to **Attachment m-01** for documentation of physical completion, including the issuance of the Certification of Final Completion and Acceptance on 14 January 2014.

4.2 Photo Album

Refer to **Attachment a-09** for photo album of SIPD.

5 SUSTAINABILITY

The primary deliverables within Component 4 included installation and commissioning of the SIPD plant and interconnection to the Kandahar distribution grid and, intensive O&M training for long-term staff assigned by DABS. The training regimen for Component 4 was well-developed and structured, and was carried out both in the classroom and on the job. Refer to **Attachment a-25** for a complete training report.

Two major conditions affected the sustainability of SIPD operation following plant handover to DABS: (1) assignment of competent trained O&M staff, and (2) DABS ability and willingness to purchase fuel for continued operations.

O&M Staff

As noted above, following SIPD handover to DABS on 31 December 2012, all staff trained by BVSPC left the site and were replaced by a limited number of inexperienced DABS staff. The replacement staff fundamentally refused training, and declined to maintain any schedule of work. Staff would intermittently arrive at the plant as needed to initiate any training. The staff also refused to take direction from BVSPC staff.

Damage to the plant was the net result of inexperienced staff operating the facility. Eight (8) of ten (10) diesel generators were damaged due to acceptance of poor quality fuel resulting from staff ignoring proper fuel acceptance procedures. Of the eight (8) diesel generators damaged, six (6) were brought back online following a request (Post-Mod 10) for BVSPC to return select staff to the site to determine cause of the failure. Of the two (2) remaining damaged diesel generators, one (Unit 3) was repaired onsite with available spare parts which had been funded by USAID and left by BVSPC upon handover to DABS. One (1) diesel generator (Unit 8) was found to need extensive repair requiring parts which were not available in the SIPD spare parts inventory. Late in 2013, it was reported that onsite DABS staff started Unit 3 without oil, resulting in catastrophic damage to the unit.

BVSPC and USAID discussed the issues and resulting problems with senior level DABS management. The DABS Chief Operating Officer traveled to Kandahar and terminated select DABS personnel involved in gross neglect resulting in plant damage. The trained but only semi-skilled had vacated the site due to lack of pay and hiring contracts with DABS. DABS eventually hired the nine (9) trainees, but did not return them to SIPD (as they had elected not to operate SIPD while still receiving subsidized power from Big SIP; see below). USAID informed DABS that DABS would need to procure the required parts and, BVSPC staff would provide guidance and assistance for repair. As of the conclusion of the contract period for Component 4, DABS had not procured the parts.

Fuel Purchase

The US government paid for all fuel supplied to SIPD up until plant handover to DABS on 31 December 2012. This fuel provision was under the Kandahar Power Bridging Solution program funded by the US military, which funded short-term diesel power generation at SIP (primarily Big SIP) and Bag-e-Pul. Per Implementation Letter No. 46, it became the

responsibility of DABS to operate and maintain SIPD to include fuel purchase following plant handover. As detailed earlier, DABS' first fuel delivery to SIPD in January 2013 was contaminated and, in combination with incompetent and untrained operators, resulted in substantial damage to the plant. By the time the plant was brought back to operational status several months later following both fuel- and flood-related damage, DABS had elected not to operate SIPD as long as Big SIP continued to serve the area utilizing fuel purchased by the US government. The US government fuel subsidy to Big SIP extended well past 2013, and is anticipated to decline to zero in 2015.

The reason for DABS' decision is based primarily on two factors: (1) DABS limited fuel procurement for Kandahar, for which deliveries must be prioritized for the neediest load centers; and (2) DABS limited current ability to recover cost in Kandahar. It is anticipated that current and planned commercialization and management initiatives for DABS Kandahar will improve the situation. Additional initiatives to establish an "islanded" power distribution system supplying the SIP business community with pay-for-use reliable and adequate power, which SIPD is fully capable of providing, are also being considered by DABS and business leaders. However, it will take time for these initiatives to bear results involving viable financial use of SIPD.

6 SECURITY PLAN AND INCIDENT REPORTS

The work associated with Component 4 was performed at SIPD. The US Army provided site security and BVSPC Subcontractors Mondial Risk Management Company (MRMC), and the Afghanistan Public Protection Force (APPF) provided support for the movement of personnel and equipment when required. BVSPC operated under a program-wide Security Plan (**Attachment a-02**) managed and coordinated by BVSPC Security Managers in conjunction with MRMC and the APPF. A separate Security Plan was also developed for the SIPD site, and is included in Attachment a-02.

There were no security incidents affecting BVSPC at SIPD throughout the duration of Component 4.

7 SAFETY PROGRAMS/PLANS

BVSPC operated under a program-wide Health and Safety Plan and Procedures (**Attachment a-04**) managed by the BVSPC Health, Safety and Environmental Manager. There was no safety incidents reported throughout the duration of Component 4. In addition, all SIPD key Component personnel successfully completed the Occupational Safety and Health Administration (OSHA) 30 hour training course certification.

8 QUALITY CONTROL (QC) PROGRAM/PLAN

BVSPC operated under a project-wide Quality Control (QC) Plan (**Attachment a-05**). The implementation of the USACE three-phase QC program at SIPD was the responsibility of the BVSPC professionals and Subcontractors engaged in the work. Oversight and guidance

was provided by qualified BVSPC Quality Management professionals under both Pre-Mod 10 and Post-Mod 10 implementation.

The O&M program included a significant recordkeeping program in addition to quality control (QC) of onsite construction. This O&M program included daily recordkeeping for each generator. Records included operating temperatures, oil pressures, kWh generated, output voltage and amperage, and operational hours. See **Attachment d-09** for copy of standard reports provided as part of O&M.

9 ENVIRONMENTAL CONTROL

KHPP's overall Environmental Plan (**Attachment a-14**) governed the activities executed under this contract component. BVSPC also developed a site-specific environmental plan for SIPD, which is provided as part of **Attachment a-14**. Regular environmental reports were submitted to USAID as required by the prime contract. The Environmental Mitigation and Management Plan (EMMP) for all construction work at SIPD was implemented with overall site and site activity environmental issues addressed. Environmental reporting and compliance documentation are presented in **Attachments a-14 through a-17**.

As part of the facility handover, DABS agreed to take receipt of the used oil filters and fouled oil for disposal. DABS personnel were briefed on the proper disposal of waste per the Afghanistan Environmental Law, and have agreed to abide by that law to the extent possible.

10 STATEMENT OF NO PATENTS, ROYALTIES OR CLASSIFIED MATERIALS

No patents, royalties, or classified materials were obtained or generated during the execution of this contract Component.

11 VALUE ENGINEERING CHANGES (IF APPLICABLE)

One value engineering change was implemented during the course of the Component 4 SIPD as noted above in Section 3.3 within the discussion of the PGS contract. The change involved elimination of the additional black start diesel at SIPD by establishing the potential use of Big SIP resulting in a savings of [REDACTED].

12 ENHANCING BEST PRACTICES (LESSONS LEARNED)

Table 7 lists considerations to enhance best practices which resulted from the implementation of Component 4:

Table 7: Component 4 – Considerations from Implementation

Observation	Impact	Best Practices Recommendation
During trial operation period 30 Sep 2012 through 10 Oct 2012, DABS trainees stopped arriving at work due to long work hours and no overtime pay incentive.	To maintain the necessary staffing to perform operations and maintenance, O&M staff should not be expected or scheduled to work longer than 48 hours per week.	<ol style="list-style-type: none"> 1. DABS to pay overtime or create other incentives for O&M staff to work overtime. 2. DABS to limit O&M staff to a 48 hour maximum work week.
Improving methods of training for O&M trainees.	A “show and then do” approach to training was the most effective teaching technique for DABS trainees in Kandahar.	Future training efforts in Kandahar should be executed by demonstrating concepts/activities, and then allowing time for the trainee to practice what was demonstrated.
Fuel injectors repeatedly failed during winter operation due to a substance found on the plungers.	Following analysis, this can be the result of two possibilities: <ol style="list-style-type: none"> 1. Oil Contamination – least likely. 2. Fuel Contamination – most likely. 	Stricter fuel procurement and delivery control and inspection measures have been implemented and must be maintained.
DABS O&M reporting is lacking in clarity and accuracy despite training.	Greater emphasis needs to be placed by DABS senior management on reporting processes and the importance of accurate reporting of O&M activities with DABS.	Get more DABS senior management buy-in to reporting requirements in addition to enhanced training and accountability related to reporting activities.
Training issues for DABS O&M staff.	Staff engagement limited due to lack of understanding of training materials as a result of low English/literacy skills.	DABS needs to continue developing detailed training programs, including the use of innovative and unique visual techniques that supplement written manuals.

Observation	Impact	Best Practices Recommendation
DABS organizational structure contributes to poor plant management.	Engineer Rasoul cannot “do it all.” DABS organization is very “flat,” which limits small unit management, leadership, accountability, and personnel performance.	A competent plant manager is essential. This plant manager needs to be given authority to direct and make decisions, and well as be held accountable for O&M and custody issues. This issue is a cultural and institutional one which is slow to change. However, additional management and commercialization activities will help.
DABS is challenged to support day-to-day operations of SIPD.	DABS cannot find and retain qualified trainees in Southern Afghanistan due to inadequate compensation and lack of competent management.	Additional commercialization activities may help DABS to generate greater revenue but, in the meantime, DABS will require continued support from the donor community to fund its operational activities.

13 WARRANTY

BVSPC, as required by the Prime Contract, has a project-wide Warranty Plan (**Attachment a-06**). For Component 4, the applicable warranties are reflected in the Letters of Warranty provided to USAID for both Pre and Post Mod 10 and are included herein as Attachments m-01 c1 and m-01 c2.

14 OUTSTANDING ISSUES

There are no outstanding issues related to the completion of the closeout of Component 4.

15 CONCLUSION: IMPACT ASSESSMENT

Component 4 provided a small industrial DPP with a maximum output capability of 6.5 MW. The plant was initially connected and provided grid power to DABS Kandahar Feeder 514 South, which supplied electricity to the Kandahar airport (terminus of the feeder), as well as to residential and business customers along the route. The SIPD plant was sometimes called “Little SIP,” as it was located immediately adjacent to the 10 MW USACE bridging plant known as “Big SIP”. USACE was located at SIP after the location was developed for Little SIP due to the strategic nature of the site relative to powering Kandahar City. The site for both plants occupied a portion of the industrial park owned by AISA, which was fully capable of housing both plants. Although AISA owns the surrounding industrial park property, it was envisioned that DABS would ultimately own and operate both plants.

The impact of Little SIP is significant given the size of the plant and the “electricity starved” condition of Kandahar City. Although all stakeholders were aware of the issues of the long-term sustainability of a diesel based power supply, the logic of placement was sound in providing a bridge to the period when additional SEPS hydropower would be completed and the NEPS-SEPS interconnection was completed. The plant was not placed as an isolated action; the plant was developed within the larger strategic plan for Kandahar City, which included a Management Contract for DABS Kandahar to assist it in becoming self-sufficient in revenue and to rationalize its rates and collections process while reducing losses. This is an ongoing and yet-to-be-completed action. The Performance Monitoring Plan for KHPP provides the metrics indicating the impact of SIPD installation and production of energy (see **Attachment a-12**).

As indicated in **Attachment a-12**, SIPD delivered an additional 7,532.5 MWH to the Kandahar City electric grid; this was only made possible by SIPD. As noted above, due to multiple technical issues, SIPD was off-line for many months but, even with these outages caused predominantly by poor fuel not noted in delivery or poor operations due to inexperience, SIPD provided capability to provide electric service to an estimated 530,000 people for select periods of time as noted in **Attachment a-12** at its peak production.

In terms of economic impact, the relationship between GDP and electric capacity and energy produced is subject to wide-ranging academic debates. Simplification and citation within **Attachment a-12** was used to obtain a best available measure of impact. The addition of 1 MW into a system has the benefit of providing a potential for 650 jobs and an estimated [REDACTED] impact on Gross Domestic Product (GDP) spread over a number of years. SIPD, assuming an 80 percent capacity factor, provided an additional 5.2 MW to the Kandahar distribution grid. This offers the potential of 3,380 additional jobs and [REDACTED] in additional GDP. In a more “friendly” environment, clear benchmarks prior to and after development of SIPD could have been developed but, was not possible in these circumstances. However, anecdotal evidence collected by discussion with business owners and government officials lends reasonable credibility that the provision of SIPD was an essential addition for jobs creation and improvement in people’s daily lives.

16 DEVELOPMENT EXPERIENCE CLEARINGHOUSE (DEC)

Documents to be submitted to the Development Experience Clearinghouse (DEC) resulting from the implementation of Component 4 are listed below:

- 1) A copy of this Closeout Report.