

SIGAR

**Special Inspector General for
Afghanistan Reconstruction**

SIGAR 18-37 Inspection Report

Afghanistan's North East Power System Phase III:
USACE's Mismanagement Resulted in a System that
Is Not Permanently Connected to a Power Source,
Has Not Been Fully Tested, and May Not Be Safe to
Operate



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SIGAR

Special Inspector General for Afghanistan Reconstruction

WHAT SIGAR REVIEWED

The North East Power System (NEPS) is intended to expand the high-voltage power system in Afghanistan, provide electricity to unserved population centers, and support a national grid by providing a cost effective, reliable system to distribute electric power to areas in northeast Afghanistan, such as Kapisa and Parwan provinces. NEPS consists of four phases. This report focuses on phase III, also referred to as NEPS III. According to the Afghan Ministry of Electricity and Water (MEW), NEPS III will provide electricity to more than one million Afghans when completed, tested, and commissioned.

On September 27, 2013, the U.S. Army Corps of Engineers (USACE) awarded a \$116 million firm-fixed-priced contract to Zwakman Nabizai Construction Company (ZNCC), an Afghan company, to design and construct NEPS phases II and III. U.S. Forces–Afghanistan (USFOR–A) funded the contract through the Afghanistan Infrastructure Fund. About \$59.7 million was allocated to phase III to design and construct 5.6 miles of 220-kilovolt power transmission lines from the Charikar substation in Parwan province to Gulbahar in Kapisa province; 26.1 miles of 110-kilovolt power transmission lines from Gulbahar to Nejrab, both in Kapisa province; and a new power substation in Gulbahar to connect both sets of transmission lines.

For this inspection, SIGAR visited the Gulbahar substation and 18 of the 182 transmission towers between the Charikar and Nejrab substations. The objectives of this inspection were to determine the extent to which NEPS III (1) has been completed, (2) is structurally sound, and (3) is safe for potential occupants.

March 2018

Afghanistan's North East Power System Phase III: USACE's Mismanagement Resulted in a System that Is Not Permanently Connected to a Power Source, Has Not Been Fully Tested, and May Not Be Safe to Operate

SIGAR 18-37 INSPECTION REPORT

WHAT SIGAR FOUND

Although NEPS III has been built, USACE's mismanagement of the contract has resulted in the U.S. government spending almost \$60 million on a power transmission project that is not operational because land-acquisition and right-of-way issues have not been resolved, and there was no contract provision to permanently connect the system to a power source. In addition, the NEPS III system may be structurally unsound and pose a risk to Afghans who live near transmission towers and lines, or work in the Gulbahar substation.

SIGAR found that USACE initiated NEPS III's construction before the Afghan government acquired privately held land along the transmission line route. The contract stated that USACE would not issue ZNCC a notice to proceed with construction until land-acquisition and right-of-way issues had been resolved. In addition, the project documents identified real estate disputes as a major risk factor to the success of the contract and stated that in the event of land disputes, USACE would mitigate the risk by suspending the contract or terminating it for convenience. In October 2011, prior to the contract award, USACE and the Afghan government signed a memorandum of understanding stating that once the Afghan government had acquired the required privately held land for the project, it would provide a right of entry memorandum allowing U.S. officials and the contractor to access land and start construction. However, to date, the Afghan government has not acquired any privately held land, which amounts to about 68 percent of the total required for NEPS III. Nonetheless, USACE issued ZNCC multiple partial or limited clearances to begin construction of the NEPS III transmission towers, power lines, and substation. ZNCC ultimately built the entire system at a cost of approximately \$60 million.

Since the Afghan government has not acquired any privately held land, Afghans still reside, in some instances, directly under transmission lines. The contract's technical specifications required ZNCC to clear the tower and line route for construction. This clearance consists of removing and disposing of trees and other vegetation, houses, barns, cattle sheds, and other structures, within about 41 feet of the center of the transmission lines. However, SIGAR found that residents are still living and farming land directly under the NEPS III transmission towers and lines.

SIGAR also found that the NEPS III contract did not include a provision to connect NEPS III to the Charikar or Nejrab substations. The contract required ZNCC to deliver power from the Charikar to the Gulbahar substation, but surprisingly, it did not include plans to connect NEPS III to the Charikar substation, its intended power source. However, in March 2017, nearly 4 years after USACE awarded ZNCC the contract, following USACE's direction, ZNCC provided a submittal for the construction of a temporary connection, called a T-connection, between the NEPS III transmission lines and the Charikar substation. The submittal did not include plans for a permanent connection. SIGAR found that ZNCC's submittal for the T-connection included sketches that did not accurately reflect the Charikar substation's configuration or the power lines coming from the substation. Despite this, USACE approved the submittal in April 2017, and ZNCC completed the T-connection in July 2017. However, ZNCC connected NEPS III to an outgoing transmission line from the Charikar substation that was not energized. As a result of

this, along with right-of-way issues not being resolved, NEPS III cannot be fully tested and commissioned or become operational. In addition, ZNCC, USACE, and Combined Security Transition Command–Afghanistan officials recognize that energizing NEPS III using a T-connection may increase the geographic area impacted by power outages and may impact the Afghan power grid’s reliability. USACE officials noted that there was a risk when making a T-connection because that type of connection does not have safety or protective electrical equipment, such as circuit breakers. In August 2017, USACE Philadelphia District Office officials, who developed NEPS III’s technical specifications, told SIGAR that the T-connection may pose a risk to the Charikar substation’s operation.

In addition, SIGAR found that the NEPS III transmission lines are not connected to the Nejrab substation. Although ZNCC was required to construct a power system to deliver power from Charikar to Nejrab, none of the contract documents contained information on how power would be delivered to the Nejrab substation. USACE Philadelphia District Office officials told SIGAR that they probably did not write the contract requirements correctly or as clearly as they should have, and the contract only states that the contractor should “deliver power,” without defining how a connection would be made. In August 2017, MEW officials told us they hope that the Afghan government will fund the construction of permanent line bay connections to the Charikar and Nejrab substations, but it could be several years before funding is available. If funding is obtained, the officials estimated that constructing, testing, and commissioning the line bays may not be completed for two years. With the system not operating, MEW officials are concerned that the Gulbahar substation and other equipment may be subject to theft, not fully tested until after the warranty expires, or degrade.

Furthermore, because the NEPS III system cannot be fully tested or commissioned, it is unclear whether the system will function as designed. USACE officials told SIGAR that until all buildings, houses, and other structures and obstacles along the NEPS III transmission line route have been removed, they will not energize NEPS III because it may put residents at risk. USACE officials stated that if ZNCC cannot clear the land along the transmission route because the Afghan government has not acquired it, USACE will modify the NEPS III contract to de-scope any testing and commissioning that cannot be completed as well as the required land clearance and structure demolition along the NEPS III transmission route. After the de-scoping, USACE told SIGAR that it would transfer the towers, transmission lines, and Gulbahar substation to U.S. Forces–Afghanistan, which, in turn, will transfer this infrastructure to the Afghan government. In July 2017, MEW officials told SIGAR they would not accept the project without fully testing and commissioning the transmission lines and substation for a number of reasons, including the likelihood the contract’s 1-year warranty period would expire before testing and commissioning was completed, meaning that ZNCC would no longer be available to address deficiencies found during testing and commissioning.

USACE officials told SIGAR that they have ethical concerns with handing over NEPS III to the Afghan government because they are aware that they are handing over an electrical system that presents life and safety hazards. USACE officials expressed concern that the Afghan government would “flip the switch” to energize NEPS III without first ensuring that residents currently living under the NEPS III transmission lines have vacated the land. In light of these concerns, USACE is implementing steps to disable the NEPS III system so that it can be turned over in a safe manner. These steps include removing high voltage conductors from the substation and securing them and all portable equipment in the locked control room within the Gulbahar substation. The officials noted, however, that Afghanistan is a sovereign nation and the government is free to operate NEPS III as it chooses once it accepts the project. On March 28, 2018, USACE provided SIGAR with documentation indicating that USACE transferred NEPS III to USFOR-A on February 3, 2018, and that the MEW accepted the project from USFOR-A that same day, despite the system being disabled and not fully tested.

In addition to mismanagement, SIGAR determined that NEPS III may be structurally unsound. ZNCC built 3 of the 18 transmission towers SIGAR inspected on embankments of loose soil and without retaining walls. Over time, these embankments will likely erode because of wind, rain, and snow, which could cause the towers to collapse and disrupt power. In addition, ZNCC added concrete to transmission tower foundations that exhibited faulty workmanship, such as exposed rebar, and has started to crumble, raising questions about whether the foundations complied with contract requirements and whether the strength of the tower foundations has been compromised. SIGAR also identified two issues that pose safety risks to occupants of the Gulbahar substation. First, ZNCC did not install the nine required certified fire-rated doors in the Gulbahar substation. The contract required the doors to be fire-rated to 45 minutes and manufactured with labels that include the manufacturer’s name, the door’s fire rating, and the logo of one of three fire door certifying agencies, such as Underwriters Laboratories. The doors installed in the Gulbahar substation were labeled with the name of the manufacturer, Abbasin Noor Construction Company and claimed to be fire-rated for 200 minutes. However, none of the three certifying agencies has a 200-minute fire rating. SIGAR estimates that USACE overpaid ZNCC by \$16,371 for the installed doors. Second, there are 136 acid batteries being stored within the substation that have an increased risk of exploding because the room they are stored in cannot be properly vented of hydrogen gas and maintained at required temperature without electricity.

WHAT SIGAR RECOMMENDS

To decrease the safety risks to Afghans living near NEPS III transmission towers and lines, and to occupants of the Gulbahar substation, we recommend that the USACE Commanding General and Chief of Engineers take immediate action to:

1. **Examine all of the transmission towers to ensure that their foundations were built in accordance with the contract, and direct ZNCC to correct all concrete foundations with the layer of concrete added after construction was completed before the warranty period expires.**
2. **Direct ZNCC to construct retaining walls to stabilize the embankments near transmission towers that do not have them before the warranty period expires.**
3. **Determine whether the installed fire door assemblies meet contract requirements, and direct ZNCC to replace those that do not or seek reimbursement from the contractor for any price difference before the warranty expires.**
4. **Ensure that the acid batteries located in the Gulbahar substation are stored in a properly ventilated and cooled environment to reduce the risk of them exploding.**

To protect the U.S. taxpayers' investment in NEPS III, we recommend that the USACE Commanding General and Chief of Engineers, in coordination with the U.S. Forces–Afghanistan Commanding General take the following actions and report their progress to SIGAR within 90 days:

5. **Work with the MEW to**
 - a. **Ensure that all land required along the NEPS III transmission line route has been acquired lawfully and that the transmission lines are secured so as not to endanger nearby structures or residents.**
 - b. **Develop a plan for establishing permanent line bay connections within the Charikar and Nejrab substations to ensure that NEPS III can receive and transmit protected power once the land-acquisition issues have been resolved.**
 - c. **Ensure that Zwakman Nabizai Construction Company or another contractor is available to make repairs needed when testing and commissioning occurs, and to repair damage that may have resulted from NEPS remaining idle for an extended time period.**
6. **Conduct an internal review to determine why USACE contracting officials omitted from the contract requirements to permanently connect NEPS III to the rest of Afghanistan's power grid and allowed ZNCC to proceed with the construction even though the Afghan government had not acquired or obtained the right to use privately held land along the transmission route, as specified in the contract.**

In its comments on a draft of this report, USACE did not concur with recommendations 1, 2, 3, 4, or 5b, and concurred with recommendations 5a, 5c, and 6. Regarding recommendations 1, 2, 3, 4, and 5b, USACE maintained that all of the transmission towers were constructed in accordance with contract requirements, the technical specifications do not require protection against landslides or erosion, the doors installed in the Gulbahar substation met contract requirements, the batteries in the substation do not pose a safety risk, and the MEW had informed USACE that there was a plan for installation of needed line bays. SIGAR disagrees with USACE that tower foundations were constructed according to contract requirements and, as noted in this report, the tower foundations showed deficiencies that were not consistent with contract requirements. Similarly, the technical specifications for NEPS III clearly state that structural foundations should be protected against landslides and soil erosion, and the design drawings for the Gulbahar substation clearly show that fire-rated doors were required. Further, the battery submittal shows that they emit hydrogen gas. Finally, while USACE stated that the MEW had informed it of a plan for installing line bays in the Charikar and Nejrab substations, it provided no documentation or time frame for this to be achieved. USACE concurred with recommendation 5a to ensure that land along the transmission line route is acquired, but did not provide a plan or timeframe for doing so. USACE also concurred with recommendation 5c, but this concurrence does not address our recommendation because USACE has provided no information as to when full testing and commissioning will occur. USACE concurred with recommendation 6 and stated that it needed to conduct more research and analysis to establish a timeline of when each parcel of land was acquired and when ZNCC was directed to proceed with construction. The draft report also included a recommendation for USACE to ensure that NEPS III components and equipment are secured to prevent theft or damage. Based on USACE's response to this recommendation, SIGAR removed it from this final report.



SIGAR

Office of the Special Inspector General
for Afghanistan Reconstruction

March 30, 2018

The Honorable James N. Mattis
Secretary of Defense

General Joseph L. Votel
Commander, U.S. Central Command

General John W. Nicholson, Jr.
Commander, U.S. Forces-Afghanistan and
Commander, Resolute Support

Lieutenant General Todd T. Semonite
Commanding General and Chief of Engineers
U.S. Army Corps of Engineers

This report discusses the results of SIGAR's inspection of the North East Power System phase III (NEPS III), which is intended to expand the high-voltage power system in Afghanistan. In September 2013, the U.S. Army Corps of Engineers (USACE) awarded a \$116 million firm-fixed-price contract to Zwakman Nabizai Construction Company (ZNCC), \$59.7 million of which was allocated to NEPS III to design and construct 220-kilovolt power transmission lines from the Charikar substation in Parwan province to the Gulbahar substation in Kapisa province; 110-kilovolt power transmission lines from the Gulbahar substation to the Nejrab substation in Kapisa province; a new power substation in Gulbahar to connect the sets of transmission lines; and other facilities and infrastructure.

Although NEPS III has been built, USACE's mismanagement has resulted in the U.S. government spending approximately \$60 million on a system that is not operational, may be structurally unsound, and presents safety risks to nearby Afghans. Further, USACE allowed ZNCC to proceed with the construction before the Afghan government obtained ownership of the necessary private land. The contract and other documentation specified that USACE would not allow ZNCC to proceed with NEPS III construction until the land-acquisition and right-of-way issues had been resolved and the Afghan government had purchased privately held land required for construction. Once the Afghan government had acquired this land, it would issue right of entry memoranda to the U.S. government to allow it to begin construction. However, to date, the Afghan government has not acquired any privately held land along the construction route, and as a result, USACE has disabled the system to prevent it from being used. Nonetheless, ZNCC has built the transmission towers, lines, and substation. USACE also failed to include a contract provision for ZNCC to connect the NEPS III permanently to the substations located at the system ends. Despite these problems, the Afghan government accepted ownership of the system in February 2018. By the time the system is operational, the warranties will likely have expired, and any deficiencies found during testing and system activation will require the Afghan or U.S. governments to incur additional costs to correct.

We are making six recommendations in this report. We recommend that the USACE Commanding General and Chief of Engineers take immediate action to:

1. Examine all of the transmission towers to ensure that their foundations were built in accordance with the contract, and direct ZNCC to correct all concrete foundations with the layer of concrete added after construction was completed before the warranty period expires.



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2. Direct ZNCC to construct retaining walls to stabilize the embankments near transmission towers that do not have them before the warranty period expires.
3. Determine whether the installed fire door assemblies meet contract requirements, and direct ZNCC to replace those that do not or seek reimbursement from the contractor for any price difference before the warranty expires.
4. Ensure that the acid batteries located in the Gulbahar substation are stored in a properly ventilated and cooled environment to reduce the risk of them exploding.

We also recommend that the USACE Commanding General and Chief of Engineers, in coordination with the U.S. Forces–Afghanistan Commanding General, take the following actions and report to SIGAR on progress of these actions within 90 days:

5. Work with the MEW to
 - a. Ensure that all land required along the NEPS III transmission line route has been acquired lawfully and that the transmission lines are secured so as not to endanger nearby structures or residents.
 - b. Develop a plan for establishing permanent line bay connections within the Charikar and Nejrab substations to ensure that NEPS III can receive and transmit protected power once the land-acquisition issues have been resolved.
 - c. Ensure that ZNCC or another contractor is available to make repairs needed when testing and commissioning occurs, and to repair damage that may have resulted from NEPS remaining idle for an extended time period.
6. Conduct an internal review to determine why USACE contracting officials omitted from the contract requirements to permanently connect NEPS III to the rest of Afghanistan's power grid and allowed ZNCC to proceed with the construction even though the Afghan government had not acquired or obtained the right to use privately held land along the transmission route, as specified in the contract.

We received written comments on a draft of this report from USACE, which are reproduced in appendix II. USACE did not concur with recommendations 1, 2, 3, 4, or 5b, and concurred with recommendations 5a, 5c, and 6. The draft report also included a recommendation for USACE to ensure that NEPS III components and equipment are secured to prevent theft or damage. Based on USACE's response to this recommendation and the documentation provided, we removed it from this final report. USACE also provided technical comments, which we incorporated into this report, as appropriate.

SIGAR conducted this work under the authority of Public Law No. 110-181, as amended, and the Inspector General Act of 1978, as amended; and in accordance with the *Quality Standards for Inspection and Evaluation*, published by the Council of the Inspectors General on Integrity and Efficiency.

John F. Sopko
Special Inspector General
for Afghanistan Reconstruction

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ABBREVIATIONS

DABS	Da Afghanistan Breshna Sherkat
LNQA	local national quality assurance
MEW	Ministry of Energy and Water
NEPS	North East Power System
USACE	U.S. Army Corps of Engineers
USFOR-A	U.S. Forces–Afghanistan
ZNCC	Zwakman Nabizai Construction Company

In April 2013, the Afghan Ministry of Energy and Water (MEW) and the Asian Development Bank established the Afghanistan Power Sector Master Plan.¹ This \$10 billion plan to provide power throughout Afghanistan involves multiple projects, including the Kajaki Hydro Power Project, the Southeast Power System, and the North East Power System (NEPS).² NEPS is intended to expand the high-voltage power system in Afghanistan, provide electricity to unserved population centers, and support a national grid by providing a cost-effective, reliable system to distribute electric power to areas in northeast Afghanistan, such as Kapisa and Parwan provinces. NEPS consists of four phases. This report focuses on phase III, also referred to as NEPS III.³ According to the MEW, NEPS III will provide electricity to more than one million Afghans when completed, tested, commissioned, and put into service.

BACKGROUND

On September 27, 2013, the U.S. Army Corps of Engineers (USACE) awarded a \$116 million firm-fixed-price contract to Zwakman Nabizai Construction Company (ZNCC), an Afghan company, for NEPS II and III. U.S. Forces–Afghanistan (USFOR-A) funded the contract through the Afghanistan Infrastructure Fund.⁴ Under the contract, \$56.4 million was allocated to phase II to design and construct 34.2 miles of 220-kilovolt power transmission lines from Pul-e Alam in Logar province to Gardez in Paktiya province and a new power substation in Gardez. The remaining \$59.7 million was allocated to phase III to design and construct 5.6 miles of 220-kilovolt power transmission lines from the Charikar substation in Parwan province to the Gulbahar substation in Kapisa province, 26.1 miles of 110-kilovolt power transmission lines from the Gulbahar substation to the Nejrab substation in Kapisa province, and a new power substation in Gulbahar to connect both sets of transmission lines (see figure 1).⁵ The contract also required ZNCC to construct other facilities and infrastructure, including a water system, a sewage system, and a kitchen facility for employees working in the Gulbahar substation’s control building.

NEPS III was originally scheduled to be completed in January 2016. However, because of land access issues and contract modifications, such as a change in the Gulbahar substation’s location and additional electrical work, ZNCC did not finish building the system until November 2017 at a cost of \$59.9 million.⁶ USACE plans to transfer the system to USFOR-A on a date yet to be determined.⁷ Afterward, USFOR-A is expected to transfer

¹ See MEW and Asian Development Bank, *Power Sector Master Plan: Final Report*, April 2013. The plan identifies the priorities, time frames, and costs associated with Afghanistan’s power sector development goals and serves as a road map for developing the national power system.

² We are currently conducting an audit of U.S. efforts to increase the supply, quantity, and distribution of electric power from the Kajaki Dam.

³ We are currently conducting a separate inspection of the NEPS phase I construction,

⁴ Congress established the Afghanistan Infrastructure Fund in April 2011 to fund infrastructure projects in support of the U.S. counterinsurgency strategy with a focus on water, power, and transportation projects, as well as related maintenance and sustainment costs. We have issued two reports on projects implemented using these funds (see SIGAR, *Afghanistan Infrastructure Fund: Agencies Have Not Assessed Whether Six Projects That Began in Fiscal Year 2011, Worth about \$400 Million, Achieved Counterinsurgency Objectives and Can Be Sustained*, SIGAR 18-10-AR, October 31, 2017; and SIGAR, *Fiscal Year 2011 Afghanistan Infrastructure Fund Projects Are behind Schedule and Lack Adequate Sustainment Plans*, SIGAR Audit 12-12, July 30, 2012).

⁵ A volt is unit of electric current, and one kilovolt is equal to 1,000 volts.

⁶ In November 2017, USACE modified the NEPS contract after construction was completed to complete additional electrical work prior to project turnover.

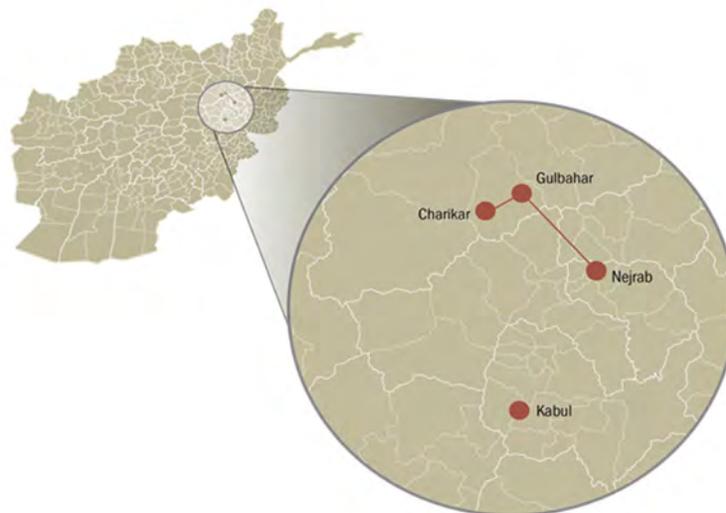
⁷ USACE’s date for transferring the NEPS III system has been delayed a number of times since the original planned date of January 2016. During the course of our review, USACE officials stated that they planned to turn the system over on February 3, 2018. However, as of the date of this report, USACE had not provided us with any documentation stating that the system had been turned over to USFOR-A or the Afghan government, or that it has established an official turnover date.

the facilities to the MEW, which will subsequently transfer them to Da Afghanistan Breshna Sherkat (DABS), the Afghan utility company.⁸

The objectives of this inspection were to determine the extent to which NEPS III (1) has been completed, (2) is structurally sound, and (3) is safe for potential occupants.

We conducted our work in Kabul and Bagram, Afghanistan, and at various locations along NEPS III from June 2016 through March 2018, in accordance with the *Quality Standards for Inspection and Evaluation*, published by the Council of the Inspectors General on Integrity and Efficiency. The engineering assessment was conducted by our professional engineers in accordance with the National Society of Professional Engineers' *Code of Ethics for Engineers*. Appendix I contains a detailed discussion of our scope and methodology.

Figure 1 - NEPS III Transmission Line Route from Charikar Substation to Nejrab Substation



Source: SIGAR analysis of contract documents.

NEPS III HAS BEEN BUILT, BUT BECAUSE OF USACE'S MISMANAGEMENT, IT IS NOT OPERATIONAL

During our site visits in September and October 2016, and March, July, and October 2017, we found that ZNCC had built the entire NEPS III system.⁹ For example, ZNCC built the transmission towers required to run power lines between the Charikar and Gulbahar substations and the Gulbahar and Nejrab substations, installed the power lines, built the Gulbahar substation, and installed the backup power batteries, all as required by the contract. However, we found the NEPS III has not been energized and is therefore not operational. Further, USACE allowed ZNCC to proceed with NEPS III's construction before the Afghan government had acquired the necessary private land along the system's transmission route. To date, the Afghan government has not acquired any of the private land. Furthermore, USACE did not include in the NEPS III contract a provision to connect the system permanently to a power source at the Charikar or Nejrab substations, which were built by the Indian and French governments, respectively.¹⁰ Instead, USACE approved a submittal for a temporary connection to the Charikar substation in April 2017, and ZNCC made the connection in July 2017, but this transmission line is not energized. However, even if the transmission line was energized, DABS technical personnel stated that the temporary connection could damage the Charikar substation's equipment and create a safety hazard for Afghans living along the transmission line route. DABS officials estimated that establishing

⁸ DABS is the national power utility company of Afghanistan, operating and managing domestic power generation as well as power importation, transmission, and distribution. DABS is owned by shareholders with shares held by the Ministry of Finance, Ministry of Energy and Water, the Ministry of Economy, and the Ministry of Urban Planning and Development.

⁹ We visited the Gulbahar substation and 18 of the 182 transmission towers between the Charikar and Nejrab substations nine times from September through October 2016, and again in March, July, and October 2017.

¹⁰ The Indian government financed the Charikar substation's construction, and according to DABS officials, the substation became operational in September 2014.

a permanent connection to the Charikar substation would require approximately \$2.5 million and could take several years. This will delay delivering reliable electricity to more than one million Afghans. Finally, without power, NEPS III cannot be fully tested and commissioned, meaning that it is unclear whether the system will function as designed.

Unresolved Land-Acquisition and Right-of-Way Issues Have Delayed NEPS III's Completion

The NEPS III contract stated that USACE would not issue ZNCC a notice to proceed with construction until land-acquisition and right-of-way issues had been resolved. Further, the NEPS III Project Management Plan identified real estate issues as a major risk area.¹¹ The plan noted that in the event of land disputes, USACE would mitigate the risk by suspending the contract to minimize costs and could terminate the contract for convenience. In October 2011, prior to the contract award, USACE and the MEW issued a memorandum of understanding stating that the Afghan government would provide the United States with a right of entry memorandum allowing U.S. government officials and the contractor to access land and begin construction once the Afghan government purchased and transferred the land to DABS. The memorandum of understanding also stated that the Afghan government would purchase land from existing owners or acquire it involuntarily if an owner did not agree to sell.

In October 2014, USACE requested that the MEW provide it with the right of entry memorandum, as called for in the 2011 memorandum of understanding, to allow USACE officials to enter public and private lands along the NEPS III transmission route, and let ZNCC to begin construction. Although it did not receive any right of entry memoranda, from November 2014 through July 2015, USACE issued five partial or limited clearance for construction letters to ZNCC to start building NEPS III.¹²

Specifically,

- In November 2014, USACE issued a limited clearance for construction of transmission tower foundations and lines on Afghan government and private land between Gulbahar and Nejrab.¹³
- In December 2014, USACE issued a partial clearance for construction of transmission tower foundations on Afghan government and private land from Charikar to Gulbahar.
- In January 2015, USACE issued a partial clearance for construction to erect 35 transmission towers between Charikar and Gulbahar and 101 towers between Gulbahar and Nejrab on Afghan government and private land.
- In February 2015, USACE issued a partial clearance for construction to erect another 37 transmission towers on Afghan government and private land between Gulbahar and Nejrab.
- In July 2015, USACE issued a limited clearance for construction of civil works on the Gulbahar substation.

In July 2017, we requested that USACE or USFOR-A provide us with documentation of any agreements between the U.S. and Afghan governments regarding land-acquisition and right-of-way issues to facilitate NEPS III's construction. In response, USFOR-A provided us with a June 2015 document from the Afghan Ministry of Public Works granting the U.S. government and ZNCC access to government-owned lands adjacent to public roads in

¹¹ USACE developed the project management plan to serve as the road map for enabling effective day-to-day operational management and control of projects, and to help support the successful delivery of project outputs.

¹² Specifically, section 3.8.5 of the NEPS III contract's technical specifications state that construction may begin after the contractor receives the clearance for construction, or notice to proceed, for each design phase. Section 1.6.2 states that the contracting officer will not issue the notice to proceed until land-acquisition and right-of-way issues are resolved for that portion of the work.

¹³ Partial clearance included site grading and leveling, excavating tower foundations, and backfilling tower foundations.

Kapisa and Parwan provinces. However, this did not address access to any of the privately held land required for NEPS III's construction.

According to USACE and USFOR-A officials, as of November 2017, the Afghan government had not acquired any of the privately held land needed for NEPS III. Private owners hold 68 percent of the land required for the NEPS III construction, while the Afghan government holds the remaining 32 percent. Residents still reside in houses on that land and, in some instances, are living and farming land directly under transmission towers and power lines (see photos 1 and 2). Despite the unresolved land-acquisition and right-of-way issues, USACE allowed ZNCC to proceed with the construction and did not implement its own plan to suspend or terminate the NEPS III contract. In July 2017, USACE officials in Bagram told us that they allowed the partial clearance to proceed only to construct the towers, lines, and substation. The officials also told us that to avoid any potential safety issues, full clearance and energizing the system would not occur until the private land was acquired. As a result, the Gulbahar substation and all 182 transmission towers have been built, but not put into use.

Photo 1 - Occupied House Under Transmission Towers



Source: SIGAR, October 4, 2017

Photo 2 - Farmland Under Transmission Towers



Source: SIGAR, October 4, 2017

In addition, because the MEW did not acquire the required private land, ZNCC did not clear the transmission line route for construction, as required by the NEPS III contract's technical specifications. The NEPS contract stated that clearing was to consist of removing and disposing of or demolishing trees and other vegetation, houses, huts, barns, cattle sheds, and other structures within about 41 feet of the center of the transmission lines. To date, ZNCC has not cleared any of this privately held land along the NEPS III transmission line route. In a March 2017 letter, USACE asked ZNCC for a schedule of activities regarding route clearance for NEPS III. ZNCC responded in the same month stating that landowners would not allow it to clear trees from the route because the Afghan government had not compensated them for the land. ZNCC also stated that it had cleared trees and other structures in areas where there were no land-use issues, and would clear the remaining land when these issues were resolved.

According to USACE officials, until all buildings, houses, and other structures along the NEPS III transmission line route have been removed, USACE will not energize NEPS III because of safety issues. USACE officials also stated that if ZNCC is not able to clear the transmission route because of the unresolved land-acquisition and right-of-way issues, USACE will modify the NEPS III contract to de-scope any testing and commissioning that ZNCC cannot complete along with the requirements for the contractor to clear land and demolish structures along the transmission line route. After de-scoping, USACE told us it would transfer ownership of the power transmission lines, towers, substation, and power line equipment to USFOR-A, which, in turn, will transfer them

to the Afghan government. On March 28, 2018, USACE provided us with documentation indicating that USACE transferred NEPS III to USFOR-A on February 3, 2018, and USFOR-A transferred the project to the MEW that same day. However, USACE did not provide documentation indicating whether it de-scoped the requirements that ZNCC did not complete from the contract.

USACE's Coordination with Stakeholders Did Not Resolve Land-Acquisition Issues

In mid-2015, USACE and USFOR-A began meeting with MEW officials to discuss issues related to ongoing construction projects, including land-acquisition issues for NEPS III, at biweekly coordination meetings.¹⁴ For example, according to the minutes from an October 22, 2016, meeting, USACE asked MEW officials questions about what was needed to resolve land issues. MEW responded that USACE should advise ZNCC to not make obligations on the Afghan government's behalf when it interacted with private landowners. In the same meeting, ZNCC officials reported that landowners were upset because they had not received payment for their land. In another example, during a December 17, 2016, meeting, ZNCC reported that it did not have access to the land required for the construction of 1 transmission tower and installation of transmission lines along 11 towers. According to the minutes, USACE and USFOR-A responded that they would not wait any longer for the issue to be resolved, while MEW officials stated that a meeting would be held with the landowners and USACE and ZNCC officials present to address all land issues.

In addition to discussions during the biweekly meetings, USACE and ZNCC raised land-acquisition and right-of-way issues in written correspondence to each other. For example, in a July 26, 2015, letter, ZNCC notified USACE that construction on 11 electrical towers between the Gulbahar and Charikar substations had been delayed because of land-use issues, such as landowners not permitting the construction of transmission towers on their land. Similarly, on October 11, 2016, ZNCC informed USACE that land-use issues along the Charikar-Gulbahar transmission line route had affected the progress of their work. According to ZNCC, these issues prevented it from constructing 6 towers and stringing transmission lines between 24 of the towers. In an October 16, 2016, letter, USACE informed ZNCC that its claim that land-use issues had delayed work was inaccurate. Specifically, USACE cited the contract specifications stating that the contracting officer would not issue the notices to proceed until all land and right-of-way issues had been resolved. Therefore, according to USACE, ZNCC would not have been allowed to proceed with the work if right-of-way was an issue. However, USACE provided no reason as to why it made this statement to ZNCC, which contradicts its actions from 2014 and 2015 when it provided ZNCC multiple letters to proceed with limited or partial clearances and construction of NEPS III even though the Afghan government had not acquired—and still has not acquired—any of the privately held land needed for the construction.

USACE's Contract Did Not Include a Requirement to Permanently Connect NEPS III to the National Power Grid

The NEPS III contract required ZNCC to design and build 220-kilovolt electrical transmission lines, 44 towers, and a power substation at Gulbahar to deliver power from the Charikar substation to the Gulbahar substation, and a 110-kilovolt transmission line and 138 towers to deliver power from the Gulbahar substation to the existing Nejrab substation.¹⁵ The Indian government built the Charikar substation, and the French government built the Nejrab substation. However, the NEPS III contract did not contain any specific information as to how

¹⁴ According to USFOR-A and USACE officials, the biweekly meetings began in mid-2015 to coordinate electrical projects, including NEPS III. The participants were MEW, DABS, and ZNCC officials, and other stakeholders as needed, and minutes were recorded for each meeting. USFOR-A and USACE officials noted that DABS attended about 10 percent of these meetings.

¹⁵ In July and October 2017, we made site visits to the Charikar substation, which was not constructed under the NEPS III contract, to identify potential impacts of NEPS III's connection to the substation. In addition, the French government built the Nejrab substation, which is operating on electricity generated by the Naghlu Dam Hydroelectric Power Plant in the Surobi district of Kabul province.

the system would connect to the two end points—the Charikar substation, which was intended to be its power source, and the Nejrab substation. As a result, in April 2017, USACE approved the submittal to make a temporary connection, known as a T-connection, to an outgoing transmission line from the Charikar substation, but did not mention any plans for a permanent connection. We found that ZNCC completed the connection in July 2017 at no additional cost to the U.S. government. Similarly, the NEPS III transmission lines and the Nejrab substation are not connected even though the contract required ZNCC to build transmission systems to deliver power from the Charikar substation and to the Nejrab substation.

Although the contract required ZNCC to construct a transmission system, none of the contract documents, such as the technical specifications and design drawings, contained information as to how NEPS III transmission lines would connect to the substation. In November 2016, USACE stated that DABS would connect to the Nejrab substation at a later time, but did not specify when this would be. As photo 3 shows, the terminal tower is not connected to the substation. Furthermore, the Nejrab substation does not have a line bay available to allow for permanent connection to NEPS III transmissions.¹⁶ As a result, NEPS III cannot deliver electricity to the substation.

In a December 2016 letter, USACE told ZNCC that the NEPS III contract required the contractor to design and construct a transmission system from the Charikar substation to deliver power to the Gulbahar and Nejrab substations. The USACE letter also stated that the connections to the Charikar and Nejrab substations were required because there would be no delivered power or a complete system without a connection. Once these connections were made, NEPS III transmission lines would transmit 220 kilovolts of electricity to the Gulbahar substation, and subsequently transmit electricity across 110-kilovolt transmission lines to another connection at the Nejrab substation.¹⁷ However, ZNCC informed USACE that the NEPS III contract did not require ZNCC to connect to either substation.

In August 2017, USACE Philadelphia District officials who served as the design agent for the NEPS II and III projects, told us that the NEPS III system’s design initially included building the Charikar substation.¹⁸ The officials also told us that the requirements to construct the Charikar substation were removed from the design once USACE learned in September 2012 that the Indian government would build the substation. However, according to the Philadelphia District officials, USACE never added a contract requirement for connecting the NEPS III project to the Charikar substation. The district officials told us that in retrospect, they probably did not write the revised NEPS III contract requirements for connection correctly or as clearly as they should have, and that the contract only stated that the contractor should “deliver power” without defining how a connection would be made. Based on our review of the contract and discussions with USACE officials in Bagram and

Photo 3 - NEPS III Terminal Tower Ending without Connecting to Nejrab Substation



Source: SIGAR, October 4, 2017

¹⁶ A line bay connection is a permanent connection made within a power substation. Unlike a T-connection, the line bay connection has protections that prevent or minimize electrical faults, such as short circuits or power surges. If an electrical fault occurs, the substation’s line bay connection will limit the area affected by the fault.

¹⁷ USACE’s letter to ZNCC stated that it should “employ the best engineering judgement to resolve the matter of connection” at the Charikar substation. USACE also told ZNCC that if “protection systems are required at the [Charikar] or Nejrab] substation to which it will connect, ZNCC must so design and provide” and “add all additional protection as necessary for their nominated plant and equipment.”

¹⁸ Specifically, USACE’s Philadelphia District provided technical reviews, managed design funds, and provided support throughout NEPS phases II and III.

Philadelphia, we determined that USACE's contract did not require a permanent or other connection for NEPS III to the Charikar or Nejrab substations. Because the Power Sector Master Plan does not specify how the various projects being completed will be connected or by whom, we attempted to obtain this information from the French and Indian governments. As of March 2018, we were not able to reach knowledgeable officials at the Indian embassy in Kabul for comment, and the officials at the French embassy had not responded about what, if any, responsibility they had regarding the connection.

Since 2016, USACE and ZNCC discussed permanent connections from NEPS III to the Charikar and Nejrab substations, but our review of correspondence showed that they did not reach any agreement for permanent connections. In July 2017, USACE officials in Bagram told us that a line bay connection at the Charikar substation is a long-term solution; however, they still have no plans to construct a line bay connection at either the Charikar or Nejrab substations. In August 2017, MEW officials told us that they hope the Afghan government will provide the funding for line bay connections, but it could be several years before it is available. If funding is obtained, DABS and MEW officials estimated that constructing, testing, and commissioning the line bays would not be completed for at least 2 years. Then in November 2017, DABS and MEW officials stated that a funding arrangement has been discussed with the Asian Development Bank to construct line bays and related equipment for the permanent connections.¹⁹ However, the DABS officials told us that they have not reached a formal agreement with the bank.

Despite Having Incomplete Information, USACE Approved ZNCC's Design for the Temporary Connection at the Charikar Substation, Resulting in the Connection Being Made to a Transmission Line that Is Not Energized

We found that ZNCC made a temporary connection from NEPS III to a transmission line at the Charikar substation that was not energized, meaning it had no electricity flowing through it. Since the transmission line connecting to the Charikar substation does not provide electricity, NEPS III cannot be fully tested and commissioned or become operational even if the land-acquisition and right-of-way issues are resolved. In March 2017, following USACE's direction, ZNCC provided a submittal for the construction of a temporary connection, known as a T-connection, between the NEPS III transmission lines and the Charikar substation. This submittal included a set of sketches depicting the transmission lines and how they might be connected to the Charikar substation. However, based on our review of the submittal package, the sketches did not accurately reflect the Charikar substation's configuration or the power lines coming from the substation. For example, the sketches included the potential location of the T-connection, but did not show that the outgoing line to which the NEPS III transmission lines would connect was not energized. The sketches also did not include diagrams showing how the transmission lines were connected to the Charikar substation.

In April 2017, USACE's Philadelphia District Office received the T-connection submittal for analysis, and the district officials recommended that the submittal be approved. In August 2017, the Philadelphia District officials told us that they expected to receive additional information showing (1) the facility layout and placement of equipment, (2) how and where tie-ins of electrical equipment would occur, and (3) the location of existing transmission lines. In April 2017, even though ZNCC's submittal did not include this information, a USACE administrative contracting officer approved the revised submittal. Further, we found that ZNCC had completed the T-connection in July 2017. During discussions with Philadelphia District officials later that month, we brought up the fact that the T-connection had been completed, and the officials said they were unaware of the completed connection. However, the officials told us that if ZNCC had included more specific design information on the T-connection in the submittal, it would have been obvious that ZNCC was connecting to a non-energized transmission line. In December 2017, the district officials told us that without a line bay connection, the T-connection was the only solution available, even though they knew it did not provide protection for the system.

¹⁹ In November 2017, DABS and MEW officials told us that the Asian Development Bank had committed \$2.5 million to fund line bays for NEPS III at the Charikar and Nejrab substations, but the officials did not provide documentation of this commitment.

The T-Connection Outside the Charikar Substation May Pose Safety Risks for Residents Living Near Transmission Lines, Could Damage Equipment, and May Affect the Reliability of Afghanistan's Electrical Grid

In December 2016, ZNCC, MEW, and DABS officials visited the Charikar substation to explore ways to establish a technically sound and safe connection from the NEPS III Charikar-Gulbahar transmission line to the Charikar substation.²⁰ Based on this visit, in that same month, ZNCC sent USACE a letter stating that using a T-connection to connect NEPS III to the Charikar substation could create a safety hazard for residents living near transmission lines and jeopardize the system's ability to deliver electricity to a large geographic area. Specifically, ZNCC stated

- A T-connection, unlike a line bay connection, has no protections against electrical faults.²¹ Any electrical fault on the Charikar-Gulbahar transmission line would transfer to the Mazar-Kabul transmission line, resulting in a power outage along both lines. This would reduce the reliability of the Mazar-Kabul transmission line, which is a major part of Afghanistan's national power grid and²²
- Transmission lines extending from the Charikar substation to the Gulbahar substation pass through populated villages. If a transmission line falls, a ground fault will occur. This means that the power line would remain electrified and could come into contact with people, houses, or other facilities, posing a risk to individuals and property in the area.

In its letter, ZNCC also noted that MEW and DABS officials opposed using a T-connection and recommended that a line bay be built at the Charikar substation for a permanent connection. In a January 2017 letter responding to ZNCC, USACE did not acknowledge the MEW's or DABS' concerns or recommendation to install a line bay for permanent connection. Instead, USACE reiterated (1) that the contract required ZNCC to design and construct systems to deliver power from Charikar to Gulbahar and from Gulbahar to Nejrab, and (2) its directive to ZNCC to provide details of how these connections would be made.

In February 2017, USACE officials sent USFOR-A a memorandum stating that there was risk involved when making a T-connection to an electrical transmission line. USACE noted that temporary connections, such as the NEPS III connection outside of the Charikar substation, do not have safety or protective electrical equipment, such as monitoring systems or circuit breakers. USACE stated that any electrical faults occurring between the Charikar and Gulbahar substations, such as a power surge or a short circuit resulting from a damaged electrical conductor, would travel along the Mazar-Kabul transmission line and continue until the fault encountered a substation with circuit breakers or other protective electrical equipment.²³ This could cause power outages across a wide geographic area, including the city of Kabul.

In August 2017, an electrical engineer from the Combined Security Transition Command–Afghanistan told us that using a T-connection to connect NEPS III outside of the Charikar substation could:

- increase the probability of an electrical fault that would lead to a power outage;
- make it more difficult to locate an electrical fault, which would make fixing the fault more time-consuming;
- increase the geographic location affected by the power outage; and

²⁰ Neither USACE nor USFOR-A officials participated in this visit.

²¹ Electrical faults include short circuits, power surges, or open circuit faults, and can damage transmission lines and power substations, and may result in power outages. Electrical faults can also spread along transmission lines, expanding the area that would be affected by the resulting power outage.

²² The Mazar-Kabul transmission line originates in Uzbekistan and connects Mazar-e-Sharif to Kabul.

²³ Conductors are materials, such as strands of wire, that permit electrons to flow from particle to particle and permit charge to be transferred across the surface of an object.

- potentially damage transmission lines and power substation equipment as a result of the fault.²⁴

The engineer also noted that while these safety and reliability concerns are legitimate, having specialized electrical protection devices, called relay protection systems, at the Charikar substation and specialized electrical engineers to operate the devices could address these problems. However, the engineer added that neither USFOR-A nor USACE had verified whether the substation had the specialized equipment or electrical engineers.²⁵ In addition, DABS technical personnel told us that without a line bay connection, there was no way to prevent the negative impacts that a T-connection could have on system reliability or safety. These personnel added that energizing the line that ZNCC connected with the T-connection could cause an explosion in the substation yard, which would result in power outages for extended periods and be expensive to repair.

In August 2017, the USACE Philadelphia District officials who developed NEPS III's technical specifications told us that they agreed with ZNCC's assessments of the risks associated with a T-connection at the Charikar substation. The officials also stated that without the equipment to protect the system from electrical faults, the T-connection posed a risk to the substation. However, similar to USACE officials in Bagram, the district officials saw no other viable alternative to making a T-connection to deliver power from the Charikar substation to the NEPS III system.

USACE and USFOR-A officials told us that even if there were problems with the T-connection at the Charikar substation and issues energizing the outgoing transmission line where the T-connection was made, there was still time to address them. In addition, in November 2017, USACE officials stated that concerns associated with using a T-connection were related primarily to the increased potential for power outages instead of the safety of individuals. They also noted that any downed power line may be dangerous, and that this would not necessarily be the result of using a T-connection. Lastly, USACE officials stated that if the Afghan government cannot address the challenges associated with connecting the T-connection and NEPS III cannot be energized, they will modify the contract to de-scope tasks ZNCC cannot complete, including some testing and commissioning. The officials also stated that neither USACE nor USFOR-A would be involved in permanently connecting the NEPS III system to the Charikar substation.

In its February 2018 project status report, USACE reported that the project would be ready for occupancy by February 14, 2018. However, USACE officials could not say definitively that the NEPS III system would be able to become operational at that time. Additionally, inspection completion dates and warranty periods are unclear. According to documentation USACE provided to us in November 2017, on July 26, 2017, a USACE local national quality assurance (LNQA) official inspected the transmission towers and lines. Documentation of this inspection states that

- no deficient items were found during the final acceptance inspection,
- the work performed for the project fully fulfilled contract requirements,
- USACE accepted the project after LNQA and ZNCC officials performed final acceptance inspection, and
- the warranty period started on the date of the inspection and would conclude 1-year from this date.

Both LNQA and ZNCC officials signed the document. Further, in September 2017, the USACE Project Engineer signed documentation stating that USACE approved this final inspection documentation. Similarly, in October 2017, LNQA officials representing USACE and ZNCC officials inspected the Gulbahar substation and produced similar documentation, which stated that no deficiencies had been found, that USACE accepted the final acceptance inspection, and that the warranty period started on October 2, 2017, and would end 1 year later. The USACE Project Engineer signed documentation accepting this final inspection on November 29, 2018. In early February 2018, USACE stated that it inspected NEPS III again on January 12, 2018, to ensure that the

²⁴ The engineer was brought in as a subject matter expert by the Combined Security Transition Command–Afghanistan to speak to us about the NEPS III connection to the Charikar substation. The engineer did not work on the project, but attended the biweekly meetings held between USACE, USFOR-A, ZNCC, and the MEW on NEPS III.

²⁵ During our October 2017 site visit, the equipment we observed in the Charikar substation was not capable of managing the connection in a way that would ensure safety and reliability.

MEW and DABS had adequate representation present, and again noted no deficiencies. Later, USACE stated the Afghan government did not start its inspection until January 20, 2018. On March 5, 2018, we spoke with a DABS official responsible for the NEPS III project. The official stated that there are still a number of deficiencies in the project, and the ministry has prepared a list of them for the contractor to correct. Then, on March 28, 2018, USACE provided us with documents showing that it turned this disabled, non-energized project over to USFOR-A on February 3, 2018, and USFOR-A transferred it to the MEW on that same day. The documents did not indicate whether NEPS III had been turned over to DABS. However, DABS officials told us on March 26, 2018, that the utility has not accepted the system from the MEW.

NEPS III Was Transferred to the Afghan Government without the Required Testing or Commissioning and Is Not Operational

As previously discussed, unresolved land-acquisition and right-of-way issues as well as poor connection to the Charikar substation have delayed NEPS III's completion, and the system has never been energized. Because of this, as of March 28, 2018, the NEPS III system has not been fully tested or commissioned. The NEPS III contract requires that testing of the transmission lines and substation occur up to "full load," meaning that the system must be powered up to the maximum capacity of the transmission lines plus ten percent.²⁶ Testing transmission lines and substations up to full load provides assurance that the system will function safely as designed during normal operation. Further, this testing allows for USACE, MEW, or DABS to identify faulty products and workmanship, which, if not identified, may pose a risk to personnel working at the substation and to the system itself. However, as stated previously, the presence of Afghans immediately below transmission lines and the temporary connection to a non-energized transmission line at the Charikar substation mean that powering the NEPS III system to allow this testing up to full load to take place creates risks to people and property along the transmission route as well as risks to the Charikar and Gulbahar substations.

In July 2017, MEW officials told us they would not accept the project without full testing and commissioning. Ministry officials stated that they have never accepted a project that was not fully tested and commissioned before transfer, adding that doing so would be risky. MEW officials expressed concern that,

- ZNCC's 1-year warranty period would expire before the transmission lines are energized;
- Components of the non-energized transmission lines, including the copper transmission lines themselves, could be stolen;
- The ministry would have to pay to secure the Gulbahar substation, the transmission towers, and the transmission lines until they are operational; and
- By the time the ministry acquires all of the land, ZNCC would not be available to test and commission the system, or be held accountable for poor construction or other deficiencies identified during testing.

In July 2017, DABS officials stated that accepting NEPS III without full testing and commissioning would be a "catastrophe" and DABS would not accept the project under these circumstances. Despite these concerns, on March 28, 2018, USACE provided us with letters showing that USFOR-A transferred NEPS III to the MEW on February 3, 2018. The letters stated that the Afghan government acknowledged that there were no deficiencies with the transmission lines and that the Gulbahar substation was in good working condition.²⁷ The letter also noted that USFOR-A "strongly recommended" that the MEW clear the transmission line route in

²⁶ In this case, full load testing means the 220-kilovolt transmission lines between the Charikar and Gulbahar substations must be powered up to 245 kilovolts, and the 110-kilovolt transmission lines between the Charikar and Nejrab substations must be powered up to 123 kilovolts.

²⁷ The USFOR-A letter transferring the Gulbahar substation listed 41 identified deficiencies, such as missing fire extinguishers and missing equipment on control panels. It also noted that energy meters were not checked because no electricity was available. It further noted that these deficiencies were under review or would be addressed in the future. USACE also provided an email dated March 22, 2018, stating that all substation deficiencies had been corrected.

accordance with its route demolition plan before energizing the system. However, the document did not indicate whether the Afghan government had committed to doing so before NEPS III becomes operational.

As of March 28, 2018, DABS had not accepted NEPS III. Between January 20 and January 30, 2018, it prepared punch lists identifying 37 deficiencies in the transmission lines' construction and 41 deficiencies in the Gulbahar substation's construction, the latter of which are listed in the letter transferring the substation to the MEW. On March 27, 2018, DABS officials told us that most of those deficiencies had been addressed. However, because the system is not operational, DABS has not tested the system under full load.

Because USACE did not complete contractually required testing of the NEPS III system up to full load, it has no assurance that the system can safely be made operational or provide one million Afghans access to electricity as intended.

Because of Safety Concerns, USACE Is Implementing Measures to Prevent NEPS III from Being Used

USACE officials told us they have ethical concerns about handing over NEPS III to the Afghan government because they are aware that the system poses known safety hazards. USACE officials expressed concern that the Afghan government would “flip the switch” to energize NEPS III without ensuring that residents currently living under and near transmission lines have vacated the land. Doing so would pose safety hazards for residents. Because of this concern, on November 6, 2017, USACE modified the NEPS III contract to require ZNCC to lock up equipment to disable the system, at an additional cost of about \$98,000, in advance of USACE turning the system over to USFOR-A.²⁸ USACE officials stated that this modification was done in order to ensure that the Afghan government would not be able to “flip the switch” to energize the NEPS III system until after the system could be safely operated. This modification to the contract, included (1) removing high voltage conductors from the Gulbahar substation's gantries to the dead-end towers and storing them in the substation; (2) locking circuit breakers in the open position, which prevents the contact plates from touching to allow the flow of electricity; and (3) securing computers, spare circuit breakers, fuses, cables, operation and maintenance manuals, and electronic and test equipment in locked rooms or cabinets.^{29, 30} The officials noted, however, that Afghanistan is a sovereign nation, and once project turnover occurs, the Afghan government is free to operate NEPS III as it chooses.

ZNCC BUILT NEPS III'S TRANSMISSION TOWERS ON LOOSE SOIL AND UNREINFORCED EMBANKMENTS, WHICH COULD THREATEN THE STRUCTURAL INTEGRITY OF THE SYSTEM

NEPS III's technical specifications required transmission tower foundations to be protected against landslides and soil erosion. We found that ZNCC built 3 of the 18 transmission towers we inspected on unstable embankments of loose soil with no retaining walls to support them. Further, we found that one of the dirt embankments was cracking (see photos 4 and 5). Over time, the embankments will likely erode because of wind, rain, and snow. If that occurs, the towers could collapse and disrupt power between the Charikar and Nejrab substations and other areas on the national grid. During our site visits, we observed some transmission towers that the Indian government built that had retaining walls around them to protect them from soil erosion.

²⁸ While the modification applied to NEPS II and NEPS III, it did not specify how much of the \$98,000 would be spent on each phase.

²⁹ This modification did not de-scope testing and commissioning or land clearance requirements.

³⁰ A gantry is a framework or overhead structure of beams or timbers used as a working platform or a means to support heavy machinery or equipment.

Photo 4 - Transmission Tower 2 Built on Unstable, Unreinforced Soil Embankment



Source: SIGAR, October 4, 2017

Photo 5 - Cracked Soil in Embankment Near Transmission Tower



Source: SIGAR, October 4, 2017

We also found that the foundations for some of the transmission towers exhibited poor workmanship. The contract technical specifications required that concrete used for transmission tower foundations be applied in one continuous pour and placed in its final position to ensure that the foundation is sufficiently dense and homogeneous. The specifications also stated that should any foundation section be rough, uneven, or honeycombed, damaged portions should be chiseled away, and the concrete should be recast to ensure structural integrity.³¹ We found that, for unexplained reasons, ZNCC applied additional concrete to the tower foundations at different times. Specifically, ZNCC added a concrete overlay to the tops and sides of some originally poured foundations. The concrete overlays contained deficiencies, such as honeycombing and exposed rebar, and the concrete was beginning to crumble (see photos 6 and 7). This poor workmanship raises questions about whether ZNCC's original foundation work complied with the contract requirements and whether the strength of the towers' concrete foundations have been compromised.

Photo 6 - Added Concrete Layers to Tower Foundations, which Is Starting to Deteriorate



Source: SIGAR, October 4, 2016

Photo 7 - Added Concrete Layers to Tower Foundations, which Is Starting to Deteriorate



Source: SIGAR, October 4, 2016

In November 2017, USACE officials told us that the tower foundations consisted of reinforced concrete footings with depths ranging from 10.8 to 12.8 feet below the ground. They stated that the additional concrete applied to the tops of the tower foundations likely serves no structural purpose because it does not increase the strength of the foundations. However, USACE did not provide us with any supporting documentation, leaving us to still question the strength of the underlying foundations and their ability to prevent the towers from collapsing.

³¹ Honeycombing refers to rough or pitted surfaces in concrete that result from incomplete filling of the concrete against the formwork, or voids in the concrete that result from incomplete filling of the spaces among the particles of coarse aggregate material.

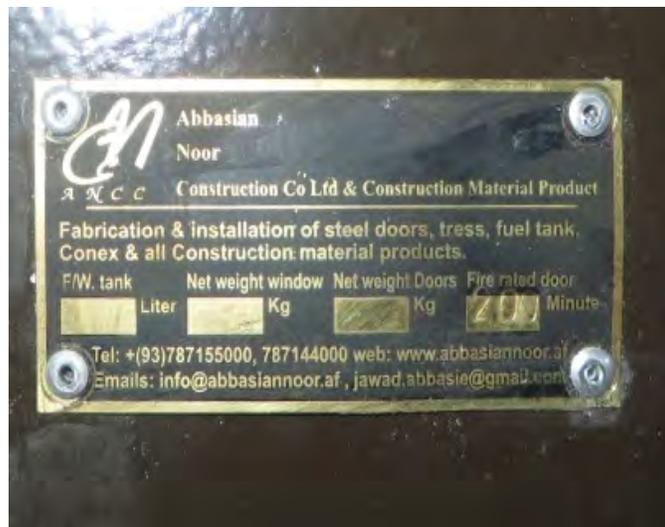
UNCERTIFIED FIRE DOORS AND BATTERIES STORED IN THE GULBAHAR SUBSTATION INCREASE SAFETY RISKS TO OCCUPANTS

ZNCC Did Not Install Certified Fire-Rated Doors, Which Could Result in Injury or Death Should a Fire Occur

ZNCC did not install the nine required certified fire-rated doors in the Gulbahar substation's control building. Fire doors are designed to protect building occupants from the spread of smoke and flames when a fire occurs. The contract required the doors to be fire-rated to 45 minutes and manufactured with labels that include the manufacturer's name, the doors' fire rating, and a logo from one of three certifying agencies—Underwriters Laboratory, Factory Mutual Engineering and Research, or Warnock Hersey-Intertek—to indicate that the fire doors meet National Fire Protection Association standards.³²

In November 2015, USACE approved ZNCC's submittal for doors manufactured by Abbasin Noor Construction Company. Per the submittal, fire doors would be manufactured in accordance with international standards and be certified by Warnock Hersey-Intertek. However, during our site visits, we found that none of the nine installed doors were certified fire-rated doors. Specifically, we found the door labels included Abbasin Noor Construction Company's name and claimed to be fire-rated for 200 minutes (see photo 8). The labels did have the logo from one of the certifying agencies, as required. We also found that Underwriters

Photo 8 - Noncertified Fire Door Installed in Gulbahar Substation



Source: SIGAR, March 11, 2017

Laboratories, Factory Mutual Engineering and Research, and Warnock Hersey-Intertek do not have a fire door category with a 200-minute fire rating, and none of them has certified Abbasin Noor Construction Company to produce fire-rated doors. We determined that the use of less costly, noncompliant doors in place of certified fire-rated doors resulted in USACE overpaying ZNCC by an estimated \$16,371.³³ SIGAR continues to examine the circumstances surrounding the approval and installation of the noncertified fire doors.

³² Fire door ratings reflect the amount of time that the doors are expected to withstand exposure to fiery conditions. Fire doors are manufactured for time intervals of 20, 45, 60, and 90 minutes, with a maximum rating of 180 minutes.

³³ We found that 45-minute fire-rated doors manufactured in the United Arab Emirates cost \$1,969 per door, and noncertified steel doors purchased locally cost \$150 per door. The cost for nine of the fire-rated doors is \$17,721, while the cost of nine noncertified doors is \$1,350. As a result, we estimated that USACE overpaid ZNCC by \$16,371 for the noncertified doors installed at Gulbahar substation.

Batteries Installed in the Gulbahar Substation Could Explode if the Facility's Ventilation System Is Not Energized

The Gulbahar substation has 136 acid batteries to use as a backup power source for the substation's control systems (see photo 9). The batteries are installed in the substation's battery room and pose the risk of explosion without a proper ventilation system to maintain the required room temperature. These batteries emit hydrogen gas even when they are not being used to power equipment. The Universal Facilities Code, which applies to NEPS III, states that facilities using these batteries must maintain a temperature- controlled and ventilated environment to mitigate the buildup of hydrogen gas.³⁴ Specifically, ventilation systems must not let hydrogen gas levels rise above 1 percent of the battery room's air volume. Hydrogen gas reaching 4 percent of the room's air volume can cause an explosion if ignited by a spark. Without electricity, because NEPS III is not operational, the substation's ventilation and air conditioning systems cannot operate. As a result, hydrogen gas may accumulate and could exceed the 4 percent threshold. If this occurs, a spark could cause the batteries in the Gulbahar substation to explode and cause a fire or injuries to substation personnel.

Photo 9 - Gulbahar Substation's Battery Room



Source: SIGAR, October 4, 2017

CONCLUSION

Although NEPS III has been built, over 2 years after its initially planned completion, it is still not operational. To date, \$60 million in U.S. taxpayer funds has been spent on a system that, to date, has provided no tangible benefit to the Afghan people. It is unclear why USACE allowed ZNCC to proceed with construction of NEPS III before the Afghan government had resolved land disputes with local residents or acquired privately held land. The contract and related documentation stated that USACE would not issue the contractor a clearance to proceed with construction until land-acquisition and right-of-way issues had been resolved and the Afghan government acquired privately held land required for construction. USACE's own project management plan stated that in the event of land disputes, USACE would mitigate the risk by suspending the contract or terminating it for convenience to minimize the financial risks. However, USACE decided to proceed with construction of NEPS III before those steps were completed, reflecting, in our view, a disregard for sound acquisition planning and management. Had USACE followed its project management plan, it could have reduced the costs associated with this project by suspending or terminating it at an early stage. Instead, USACE instructed ZNCC to disable the system, at an additional cost, to prevent the Afghan government from activating the system while residents are still living along the transmission line route.

Further, although the NEPS III contract required ZNCC to build transmission towers and lines, USACE did not include a requirement for the contractor to connect the lines permanently to the system's intended power source. USACE has had 4 years since it awarded the contract to determine how to make these connections but has failed to do so. USACE attempted to resolve part of this problem by requiring its contractor to connect NEPS III to the Charikar substation via a temporary connection. However, that has not worked because challenges with a temporary connection may increase the risk of a local or even a regional power outage to other portions of the grid that are actually operational if a system fault occurs. At the other end, the NEPS III

³⁴ See Universal Facilities Code 3-520-05, sections 2-2.2, 2-3.2, and 2-3.2.2.1.

transmission lines terminate outside of the Nejrab substation. USACE and the Afghan government now estimate that establishing safe and permanent connections to the Charikar and Nejrab substations could take years and require millions in additional funding. In the meantime, the Gulbahar substation and other transmission line equipment may be at risk of theft and decay. As it currently stands, the Afghan government has accepted ownership of a disabled system that is not operational and may even pose a threat to Afghan residents and the reliability of Afghanistan's power grid.

In addition, NEPS III may be structurally unsound, which could threaten the entire system, and it has two issues that pose safety risks to occupants of the Gulbahar substation. ZNCC built three transmission towers on loose soil and unreinforced embankments, and some tower foundations exhibited poor workmanship that leads us to question whether the strength of those foundations has been compromised. This could cause any of those towers to collapse, resulting in power outages and endangering the lives of Afghans living under and near them. In addition, ZNCC did not install certified fire-rated doors in the Gulbahar substation, and USACE may have overpaid ZNCC by \$16,371 for the doors it did install. The doors also contain labels that specify a 200-minute fire rating, which is unrealistic and could give a false sense of security to occupants should a fire occur. There are also 136 unused acid batteries in the substation that have an increased risk of exploding because the room they are installed in cannot be properly vented of hydrogen gas. If USACE does not direct ZNCC to correct construction deficiencies, either the U.S. or the Afghan government may incur additional costs to correct them. Finally, USACE has provided documentation to ZNCC that absolves it of its warranty responsibilities as early as July 2018, which further jeopardizes the \$60 million U.S. government investment in the project.

RECOMMENDATIONS

To decrease the safety risks to Afghans living near NEPS III transmission towers and lines, and to occupants of the Gulbahar substation, we recommend that the USACE Commanding General and Chief of Engineers take immediate action to:

- 1. Examine all of the transmission towers to ensure that their foundations were built in accordance with the contract, and direct ZNCC to correct all concrete foundations with the layer of concrete added after construction was completed before the warranty period expires.**
- 2. Direct ZNCC to construct retaining walls to stabilize the embankments near transmission towers that do not have them before the warranty period expires.**
- 3. Determine whether the installed fire door assemblies meet contract requirements, and direct ZNCC to replace those that do not or seek reimbursement from the contractor for any price difference before the warranty expires.**
- 4. Ensure that the acid batteries located at the Gulbahar substation are stored in a properly ventilated and cooled environment to reduce the risk of them exploding.**

To protect the U.S. taxpayers' investment in NEPS III, we recommend that the USACE Commanding General and Chief of Engineers, in coordination with the USFOR-A Commanding General, take the following actions and report the progress of these actions to SIGAR within 90 days:

- 5. Work with the MEW to**
 - a. Ensure that all land required along the NEPS III transmission line route has been acquired lawfully and that the transmission lines are secured so as not to endanger nearby structures or residents.**

USACE did not concur with recommendation 4 to ensure that the acid batteries located in the Gulbahar substation are stored in a properly ventilated environment to reduce the risk of explosion. USACE acknowledged the concerns about the batteries, but noted that the vast majority of gas emission occurs during charging, not during storage. USACE also noted that the Unified Facilities Code 3-520-05 states that the ventilation requirement for battery rooms does not apply to stored batteries. USACE stated that even without a ventilation requirement, it believes the air turnover in the storage room was adequate to ventilate the batteries during storage. However, photo 9 in this report shows that the batteries in the Gulbahar substation are connected to the control room consoles, and, therefore, are not in storage. Further, as noted in our report, these batteries emit hydrogen gas even when they are not being used to power equipment. In addition, USACE's approved submittal noted that the battery plugs allowed flammable gas to discharge easily. As a result, this recommendation remains open.

USACE concurred with recommendation 5a to ensure that all land required along the NEPS III transmission line route has been lawfully acquired and that the transmission lines are secured so as to not endanger nearby structures or residents. USACE stated that it provided the right-of-way files with obstructions to the MEW and grounded selected towers in a "make safe" configuration, so that the MEW can address the hazardous obstructions. However, USACE did not provide us with documentation of any plans to work with the MEW to ensure that necessary land would be acquired to ensure that NEPS III can be operated safely. Therefore, we do not have confirmation that land will be acquired and cleared to ensure that the entire route is made safe and that residents living along the transmission line route are safe. Further, USACE did not acknowledge that it constructed the NEPS III without documentation showing that private land-acquisition and right-of-way issues had been addressed, as the contract required. In our view, this has put the NEPS III system's safety and usability at risk. Since USACE did not provide a plan to ensure that land issues will be resolved, this recommendation remains open.

USACE did not concur with recommendation 5b to develop a plan for establishing a permanent line bay connection within the Charikar and Nejrab substations to ensure that NEPS III can receive and transmit power. USACE told us that it had been informed that the MEW had a plan for permanent line bays at each substation. However, USACE did not provide us with documentation showing that such a plan existed or the timeframes for when these line bays would be constructed. USACE officials maintain that other governments, including the Indian and French governments, which constructed the Charikar and Nejrab substations, respectively, had agreed to construct line bays, but have not done so. Although we requested it, to date, USACE has not provided us with any documentation showing that these governments agreed to construct the line bays. We were not able to reach knowledgeable officials with the Indian embassy in Kabul for comment, and officials at the French embassy did not respond about what, if any, responsibility they had regarding the connection as of the date of this report.

USACE has also maintained that constructing a line bay connection at the Charikar substation was outside the scope of the NEPS III contract. We find USACE's responses puzzling because a July 2013 assessment of Afghanistan Infrastructure Fund, completed in accordance with requirements in Section 1273 of the National Defense Authorization Act for Fiscal Year 2013, states that the NEPS project would include the necessary infrastructure to connect the NEPS III transmission lines to the Charikar substation. USACE has had more than 4 years since it awarded the NEPS III contract to establish permanent connections for the project. However, it only established a temporary connection to the Charikar substation in July 2017 and has not made any connection to the Nejrab substation. Without the line bay connections to these two substations, NEPS III will not have a permanent power source, and there will be no protections for the system if it is energized with the T-connection. This puts the U.S. government's \$60 million investment in NEPS III and other parts of Afghanistan's national power grid at risk. As a result, this recommendation remains open.

USACE concurred with recommendation 5c to ensure that ZNCC or another contractor is available to make repairs needed when testing and commissioning occurs and to repair damages that may have resulted from NEPS III remaining idle for an extended time period. In its response, USACE stated that ZNCC will be available for 1 year to make warranty repairs from the date USFOR-A transfers the NEPS III transmission lines and the

Gulbahar substation to the MEW and DABS. However, this response does not address our recommendation since the warranty period starts when an inspection is accepted. Based on our review of USACE documentation and statements it made to us in January and February 2018, it is unclear when the warranty period started. USACE initially provided us documentation stating that the warranty period for the transmission lines and towers as well as the Gulbahar substation began in July and October 2017, respectively. ZNCC and USACE officials signed these inspection documents, and the USACE project engineer approved them. However, in January 2018, USACE officials told us that the final inspection information that USACE accepted, approved, and provided to us was incorrect, but it did not provide any documentation showing that these inspection documents, including the warranty dates cited, were rescinded. USACE also informed us that ZNCC and LNQA officials inspected NEPS III again on January 12, 2018, but did not provide us with any documentation of this inspection. On January 31, 2018, USACE provided us a serial letter it sent to ZNCC, dated January 13, 2018, stating that NEPS III was sufficiently complete and the warranty started on January 12, 2018.³⁵ Based on this conflicting information, it is unclear whether ZNCC's warranty responsibilities for the transmission towers and substation will expire in July and October 2018, respectively, or in January 2019, which will impact whether the warranty is still active if any deficiencies are identified later.

In addition, USACE has not provided any information indicating when full-load testing and commissioning will occur. Based on USACE statements and documentation provided, it appears that it will not occur before USACE transfers the system to USFOR-A, if it occurs at all. As recently as January 2018, USACE officials were still negotiating with ZNCC about whether USACE will de-scope contractual requirements for full-load testing at 220 and 110 kilovolts or requirements for demolition of structures adjacent to the transmission line route. Because full testing and commissioning will not be completed before the NEPS III system can be energized, repairs will likely be required before the NEPS III can safely become operational, which could occur after the warranties expire. As a result, this recommendation remains open.

USACE concurred with recommendation 6 to conduct an internal review to determine why USACE contracting officials omitted from the contract requirements to permanently connect NEPS III to the rest of Afghanistan's power grid, and allowed ZNCC to begin construction even though the Afghan government had not acquired privately held land along the transmission line route. USACE noted that it anticipated, and included in the contract, that line bays for permanent connection to the Nejrab and Charikar substations would be made by other donor nations, but these line bays were never realized. As a result, USACE stated that it worked with the MEW and DABS on alternatives for connecting the NEPS III transmission lines. However, as we discuss in this report, despite of our requests, USACE did not provide us with documentation of any agreements indicating that other governments developed plans to build line bays at either the Charikar or Nejrab substations to connect to the NEPS III system. Further, USACE did not provide documentation of any power or connection activities that were planned but not carried out by other governments and, as a result, had an adverse effect on the NEPS III project. Ultimately, this failure to plan for these connections resulted in the contractor making a temporary connection from the NEPS III system to a non-energized transmission line coming from the Charikar substation. On the opposite end, NEPS III ends at a terminal transmission line outside the Nejrab substation.

Regarding the land issue, USACE stated that it needed to conduct more research and analysis to establish a timeline of when each parcel of land was acquired and when ZNCC was directed to proceed with construction, and would give us an update within 90 days after we issue this final report. This recommendation will remain open until we receive the results of that analysis.

USACE concurred with a recommendation in our draft report to ensure that NEPS III components and equipment are secured to prevent theft or damage. USACE noted that it secured the Gulbahar substation with perimeter fences and lockable buildings, and that the Afghan government would be responsible for security once the project is handed over to it. Further, in November 2017, USACE modified the contract to require ZNCC to disable the substation and tower equipment. Based on USACE's actions and our review of the modification, we closed this recommendation and removed it from this final report.

³⁵ Serial letters are numbered and tracked correspondence between contracting officials and contractors.

APPENDIX I - SCOPE AND METHODOLOGY

This report provides the results of SIGAR's inspection of the North East Power System phase III (NEPS III). The objectives of this inspection were to determine the extent to which NEPS III (1) has been completed, (2) is structurally sound, and (3) is safe for potential occupants. Specifically, we

- reviewed contract documents, design submittals, and other relevant project documentation;
- conducted an engineering assessment of the project drawings and construction methods used;
- interviewed U.S. and Afghan government officials concerning the project's construction, use, and maintenance; and
- made nine site visits to the Gulbahar substation and 18 of the 182 transmission towers between the Charikar and Nejrab substations from September through October 2016, and visited these facilities again in March, July, and October 2017.

We did not rely on computer-processed data in conducting this inspection. However, we considered the impact of compliance with laws and fraud risk.

In December 2014, SIGAR entered into a cooperative agreement with Afghan civil society partners. Under this agreement, our Afghan partners conduct specific inspections, evaluations, and other analyses. In this regard, Afghan inspectors and an engineer inspected the Gulbahar substation and the 18 transmission towers during multiple site visits from September 2016 to October 2017. We developed a standardized engineering evaluation checklist covering items required by the contract and design/specification documents. The checklist required our partners to analyze the contract documents, scope of work, technical specifications, and design drawings.

We compared the information our Afghan civil society partners provided to accepted engineering practices, relevant standards, regulations, laws, and codes for quality and accuracy. In addition, as part of our monitoring and quality control process, we

- met with the Afghan engineer to ensure that the approach and planning for the inspection were consistent with the objectives of our inspection and the terms of our cooperative agreement;
- attended periodic meetings with our partners, and conducted our normal entrance and exit conferences with agency officials;
- discussed significant inspection issues with them;
- referred any potential fraud or illegal acts to SIGAR's Investigations Directorate, as appropriate;
- monitored our partners' progress in meeting milestones and revised contract delivery dates as needed; and
- conducted oversight of them in accordance with SIGAR's policies and procedures to ensure that their work resulted in impartial, credible, and reliable information.

We conducted our inspection work in Kabul and Bagram, Afghanistan, and at various locations along NEPS III from June 2016 through March 2018. This work was conducted in accordance with the *Quality Standards for Inspection and Evaluation*, published by the Council of the Inspectors General on Integrity and Efficiency. The engineering assessment was conducted by our professional engineer in accordance with the National Society of Professional Engineers' *Code of Ethics for Engineers*. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our inspection objectives. We conducted this inspection under the authority of Public Law No. 110-181, as amended, and the Inspector General Act of 1978, as amended.

APPENDIX II - COMMENTS FROM THE U.S. ARMY CORPS OF ENGINEERS



DEPARTMENT OF THE ARMY
UNITED STATES ARMY CORPS OF ENGINEERS
TRANSATLANTIC DIVISION
201 PRINCE FREDERICK DRIVE
WINCHESTER, VIRGINIA 22602-4373

January 25, 2018

SUBJECT: Response to Special Inspector General for Afghanistan Reconstruction (SIGAR) Draft Report (Project Code SIGAR-I-041), Afghanistan's North East Power System Phase III: USACE's Mismanagement Has Resulted in as System that is Not Energized and May Be Structurally Unsound and Unsafe

Mr. John F. Sopko
Special Inspector General for Afghanistan Reconstruction
1550 Crystal Drive, Suite 900
Arlington, VA 22202

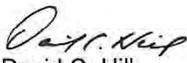
Dear Mr. Sopko:

The purpose of this letter is to provide the U.S. Army Corps of Engineers (USACE) response to the subject report.

USACE non-concurs with recommendations 1 through 4 and 5.b and concurs with recommendations 5.a, 5.c, 5.d, and 6.

Additional details are provided in the enclosures. My point of contact for this response is Mr. George Sullivan, TAD Internal Review Auditor. He may be reached by e-mail at George.a.sullivan@usace.army.mil or by telephone at 202-761-4573.

Sincerely,


David C. Hill
Brigadier General, U.S. Army
Commanding

Enclosures

U.S. Army Corps of Engineers (USACE) Response to Special Inspector General for Afghanistan Reconstruction (SIGAR) Draft Report (Project Code SIGAR-I-041), Afghanistan's North East Power System Phase III: US. Army Corps of Engineers Mismanagement Has Resulted in a System that Is Not Energized and May Be Structurally Unsound and Unsafe

This document provides USACE comments in response to the six recommendations in SIGAR's Draft Report on SIGAR's Inspection of the North East Power System Phase III (SIGAR-I-041) and USACE comments for report clarification.

1. SIGAR RECOMMENDATIONS AND USACE COMMENTS IN RESPONSE.

a. Report Title. The SIGAR title of the report misrepresents the efforts of USACE to design and construct a 10 km long 220kV transmission line system with 44 towers from Charikar to Gul Bahar and a 40 km long 110kV transmission line system with 138 towers from Gul Bahar to Nejrab, as well as construct a 220kV/110kV substation at Gul Bahar. While it is unusual for an audited organization to comment on a report title, the title of this report necessitates that we respond: USACE suggests a title such as: Afghanistan's North East Power System Phase III: Interagency Challenges to System Completion and Energizing.

SIGAR Comment 1

b. Lack of a Designated Master Planner and Overall Integrator. NEPS III is a small part of the Afghanistan Power Sector Master Plan which includes improvements and investments being made throughout the country by various international donors (Asian Development Bank, India, and France, among others) and the Afghan government. This is outlined in the Vision 2020 Master Plan for Afghanistan, drafted in 2010 under direction of the Ministry of Energy and Water (MEW) and Da Afghanistan Breshna Sherkat (DABS). The U.S. authorized the Afghanistan Infrastructure Fund (AIF) program in 2011 and through USAID and USFOR-A committed to accomplish power improvements in the south, the South East Power System (SEPS), expansion in the north, the North East Power System (NEPS), and ultimately the connection of the two systems with a NEPS-SEPS Connector project. This approach to capital improvements to the national Power Grid relies on all parties accomplishing what they committed to as part of the Vision 2020 to ensure the complete grid's build-out and render it operational. In the 15 years since initiating the improvements some features are not complete due to a rapidly changing environment and limited resources. This does not mean these gaps cannot be filled with future investments by other donors, however, it does suggest that a single agency needs to be designated to ensure unity of effort going forward. The NEPS III project is a nearly complete, useable, and energizable project that will bring benefits to the people of Afghanistan. This report does not make any recommendations on formalizing coordination with other agencies going forward in order to improve delivery of the remaining national grid power projects or give credit to the complexity of these power projects and successful informal coordination and collaboration that has occurred to date to build the entire NEPS system.

SIGAR Comment 2

c. Although Important, USACE's Role Is Limited. Each of the USACE NEPS contracts is defined in scope with cooperative agreements. MEW/DABS is responsible for overall project integration. As with any mega-project with multiple contractors, all building separate parts and pieces at the same time, not all segments get completed

U.S. Army Corps of Engineers (USACE) Response to Special Inspector General for Afghanistan Reconstruction (SIGAR) Draft Report (Project Code SIGAR-I-041), Afghanistan's North East Power System Phase III: US. Army Corps of Engineers Mismanagement Has Resulted in a System that Is Not Energized and May Be Structurally Unsound and Unsafe

exactly as planned. The rationale used in the SIGAR report appears to suggest that if USACE finished a project before another critical piece of the grid was available, USACE should build the incomplete segment or terminate the contract. SIGAR's report seems to expect USACE to continuously modify the contract(s) and ignores the fact that those features were to be completed by others, and that USACE cannot guarantee that the originally assigned projects, outside the scope of the USACE contracts, were executed as intended. This faulty logic; does not consider signed agreements with funding limitations between USAID and USACE, resource constraints, and contractual limitations of working outside the scope of a contract.

SIGAR Comment 3

d. Response to Recommendations:

Recommendation 1: Examine all of the transmission towers to ensure that their foundations were built in accordance with the contract, and direct ZNCC to correct all concrete foundations with the layer of concrete added after construction was completed before the warranty period expires in July 2018.

USACE RESPONSE: Non-concur. USACE maintains that all 182 transmission towers, to include the concrete tower foundations, were constructed in accordance with contract requirements at an acceptable level of quality. SIGAR's pictures of the exposed few inches of the massive concrete placements does not accurately represent the soundness of the foundations, which USACE maintains meet contract and design requirements.

The layer of concrete added to the very top of the tower foundations was an effort by the contractor to reduce the opportunity for theft of the grounding cable by embedding it in concrete. See protective concrete for grounding photos below.

Since the towers were located in areas too dangerous for USACE Department of Army Civilians to safely travel to, USACE utilized a Personal Services Contract for on-site quality assurance. Afghan engineers and construction professionals provided daily quality assurance/site inspection of transmission line/tower construction activities, to include observing tower foundation placement, providing pictures of placed foundations at various stages; receiving tower foundation concrete quality assurance laboratory test results which were then reviewed by USACE engineers for contract compliance; completing tower construction checklists to ensure towers were constructed in accordance with accepted designs; receiving, reviewing, and commenting on the contractor's daily Quality Control reports on construction activities, and providing their own daily Quality Assurance (QA) reports denoting their observations and findings. See enclosures 2 through 5 for additional information: enclosure 2, representative samples of the typical foundation construction pictures; enclosure 3, concrete lab test results; enclosure 4, tower checklists; and enclosure 5, daily QA reports.

U.S. Army Corps of Engineers (USACE) Response to Special Inspector General for Afghanistan Reconstruction (SIGAR) Draft Report (Project Code SIGAR-I-041), Afghanistan's North East Power System Phase III: US. Army Corps of Engineers Mismanagement Has Resulted in a System that Is Not Energized and May Be Structurally Unsound and Unsafe

The NEPS III project has not been officially transferred to the end user, MEW/DABS, our sponsor, USFOR-A, nor has the warranty period begun. SIGAR's July 2018 date is incorrect; USACE is currently working towards turning it over by 31 January 2018.

Following are pictures of the concrete added to the tower foundations to limit theft.



Recommendation 2: Direct ZNCC to construct retaining walls to stabilize the embankments near transmission towers that do not have them before the warranty period expires in July 2018.

USACE RESPONSE: Non-concur. First, the technical specifications do not require protection against landslides nor soil erosion. We reviewed SIGAR's allegation that Tower 2 and others were constructed on unstable embankments of loose soil. The angle of Photo 4, on page 12 of SIGAR's draft report, is deceptive as to the overall construction of the tower and its foundation. Included on page 4 of this document are photos as to how the tower's foundation for each leg was constructed on a reinforced concrete pedestal and then reinforced with compacted backfill that provides engineered protection of the tower bases. Any erosion from the minimal rain in the region's arid environment would be of little consequence. Photo 5 in SIGAR's draft report, clearly

U.S. Army Corps of Engineers (USACE) Response to Special Inspector General for Afghanistan Reconstruction (SIGAR) Draft Report (Project Code SIGAR-I-041), Afghanistan's North East Power System Phase III: US. Army Corps of Engineers Mismanagement Has Resulted in a System that Is Not Energized and May Be Structurally Unsound and Unsafe

shows the extensive protective embankment constructed and the crack is a result of drying out from the compaction efforts. Diversion structures were constructed according to the Designer of Record's drawings, where erosion from water was a concern. SIGAR references unexplained reasons for additional concrete overlay to some of the tops of the original foundations as shown in Photo 6 in SIGAR's draft report. The contractor added non-structural concrete to cover the grounding lug and cable of the tower leg to help prevent theft of the copper cable – an example photo is attached above. Not every leg of a tower is grounded which results in only grounding legs receiving the protective cover. This is not deteriorating as alleged. The concrete follows the cable over the edge and original foundation works contain no honeycombing as can be seen in Photos 6 and 7 in SIGAR's draft report. The contractor provided additional concrete to help protect the investment. SIGAR's assertion that towers constructed will collapse is not based on sound engineering principles. As stated above, the NEPS III project has not been transferred to the Afghans as of the drafting of this report.

Following are pictures showing how each tower leg was constructed.



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Recommendation 3. Determine whether the installed fire door assemblies meet contract requirements, and direct ZNCC to replace those that do not or seek reimbursement from the contractor for any price difference before the warranty expires in October 2018.

USACE RESPONSE: Non-concur. The installed doors meet the requirements of the contract. This contract was issued/awarded as a design-build contract with the contractor designing the substation facility. The contract plans and specifications refer to National Fire Protection Association (NFPA) 101, which does not require fire rated corridors for single tenant facilities, which the substation facility is classified as. Per the NFPA, a fire rated door would only be required for the storage room, but since the only door to the storage room exits directly to the outside, a fire door is not required there either. Therefore no fire rated doors are required throughout the substation.

Recommendation 4: Ensure that the acid batteries located in the Gulbahar substation are stored in a properly ventilated and cooled environment to reduce the risk of them exploding.

USACE RESPONSE: Non-concur. We acknowledge the concern about the batteries themselves; however, the vast majority of off gassing occurs during charging not during storage. Per UFC 3-520-05 Stationary Battery Areas; the ventilation requirement for battery rooms does not apply to batteries in storage or under float charge.

Even without a requirement for ventilation, USACE believes the air turnover in the storage room is adequate to properly ventilate the batteries during storage.

Recommendation 5: Work with the MEW to:

U.S. Army Corps of Engineers (USACE) Response to Special Inspector General for Afghanistan Reconstruction (SIGAR) Draft Report (Project Code SIGAR-I-041), Afghanistan's North East Power System Phase III: US. Army Corps of Engineers Mismanagement Has Resulted in a System that Is Not Energized and May Be Structurally Unsound and Unsafe

a. Ensure that all land required along the NEPS III transmission line route has been acquired lawfully and that the transmission lines are secured so as not to endanger nearby structures or residents.

b. Develop a plan for establishing permanent line bay connections within the Charikar and Nejrab substations to ensure that NEPS III can receive and transmit protected power once the land acquisition issues have been resolved.

c. Ensure that NEPS III components and equipment are secured to prevent theft or damage.

d. Ensure that ZNCC or another contractor is available to make repairs needed when testing and commissioning occurs, and to repair damage that may have resulted from NEPS remaining idle for an extended time period.

USACE RESPONSE:

a. Concur. USACE has provided the Right of Way files with obstructions to MEW. Upon transfer, we will have grounded the selected towers over the route in a 'make safe' configuration, so that the hazardous obstructions can be addressed by MEW.

b. Non-Concur. USACE has been informed by MEW that they have a plan for permanent line bays at each substation. A line bay for USACE's transmission line to be connected to, at the Charikar SS, was supposed to be built by the Indian Government, who constructed the actual SS. This line bay was descope by the Indian Government due to limited funding. USACE had no control over the construction of this substation or ability to influence the Indian government. This is what has led to the current challenges in connecting the transmission line. USACE has no funds available to modify the contract to have ZNCC design and build a line bay in the Charikar Substation.

There is no line bay at Nejrab that can be connected. The Nejrab substation was to be built by others (the French Government), with an unknown schedule at the time of the writing of the NEPS III Request for Proposal. The NEPS III transmission line to Nejrab was finished in 2015, before the construction of the Nejrab substation. The USACE contractor placed one last tower in a place that would be next to the planned substation, as USACE was not provided any information on the substation from the French government, DABS, or MEW. Although there is a place for a line bay to be built, no line bay currently exists. No funds are available to modify the contract and have ZNCC design and build a line bay in the Nejrab Substation.

U.S. Army Corps of Engineers (USACE) Response to Special Inspector General for Afghanistan Reconstruction (SIGAR) Draft Report (Project Code SIGAR-I-041), Afghanistan's North East Power System Phase III: US. Army Corps of Engineers Mismanagement Has Resulted in a System that Is Not Energized and May Be Structurally Unsound and Unsafe

c. Concur. The NEPS III components and equipment will be transferred to MEW/DABS through USFOR-A. MEW/DABS will be responsible for the security and maintenance of the components and equipment once transferred and accepted. The constructed towers are vandal resistant and the Gulbahar substation is secured by a perimeter fence with lockable buildings.

d. Concur. ZNCC will be available for a period of one year, from the date of transfer of the Phase III transmission lines and Gulbahar substation, to MEW/DABS through USFOR-A, to perform any warranty repairs of covered systems and components.

Recommendation 6. Conduct an internal review to determine why USACE contracting officials omitted from the contract requirements to permanently connect NEPS III to the rest of Afghanistan's power grid and allowed ZNCC to proceed with the construction even though the Afghan government had not acquired or obtained the right to use privately held land along the transmission route, as specified in the contract.

USACE RESPONSE: Concur. The requirement for USACE was to contract and build an electrical transmission line system from Charikar to Gul Bahar and from Gul Bahar to Nejrab, as well as to construct a new substation at Gul Bahar. It was anticipated, and included in the contract, that line bays and switch yards would be provided by other donor nations. The line bays from the other donor nations were never realized and could not be constructed under the USACE contract as the work was not part of the scope of the contract. USACE worked directly with MEW/DABS on alternatives for connecting the transmission lines and once agreed upon were relayed to ZNCC for execution. More research time is required to sift through the multitude of documents to clearly show the timeline of when each parcel of land was acquired and when direction was given to ZNCC to proceed with the construction effort. Preliminary research shows that multiple Notices to Proceed (NTP) or Partial Clearances for Construction were issued by both the Contracting Officer and Administrative Contracting Officer between 18 Jan 2014 and 15 Mar 2015 for site work and tower erection along the Charikar to Gul Bahar transmission line, the Gul Bahar to Nejrab transmission line, and the Pul-e-Alam to Gardez transmission line.

Additionally, initial research produced a License for Construction, Land Access, and Land Usage of Certain Rights of Way in Afghanistan from the GoIRA Ministry of Public Works dated 2 June 2015.

Further research and analysis is required to more accurately answer the question. This recommendation remains open and SIGAR will be provided an update within 90 days after the final report issuance.

U.S. Army Corps of Engineers (USACE) Response to Special Inspector General for Afghanistan Reconstruction (SIGAR) Draft Report (Project Code SIGAR-I-041), Afghanistan's North East Power System Phase III: US. Army Corps of Engineers Mismanagement Has Resulted in a System that Is Not Energized and May Be Structurally Unsound and Unsafe

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2. USACE COMMENTS FOR REPORT CLARIFICATION.

Concerning the NEPS III Contract Inspection, USACE provides the following additional information for report clarification. Specifically, SIGAR misleads the public by indicating that actions by USACE resulted in mismanagement of the contract, the system being non-operational, unresolved land dispute issues, and that there is not an actual power system to which to connect NEPS III. Further, some of SIGAR's statements are factually incorrect. Specific examples follow:

a. Recommended Changes and Corrections to the Report. SIGAR has incorrectly concluded that USACE accepted final inspections of the transmission lines and towers in July 2017, and the substation in October 2017. And furthermore, the report indicates that as a result, the one year warranty period for the projects began on those dates and would end a year later in July and October 2018. This is not the case. The projects were not successfully completed, accepted or transferred as of the writing of this response to the draft report. At a meeting with SIGAR on 17 Jan 2018, at their request, to discuss the draft report, USACE identified these significant report errors. Subsequently, SIGAR asked for an explanation as to "why the Local National Quality Assurance Engineer (LNQA) acceptance of final inspection and COR approval of the submittal was not official and why another inspection is required." The supporting documents referenced by SIGAR, as the basis for forming their understanding that the projects were complete were USACE Eng. Forms 4025, Transmittal of Shop Drawings, Equipment Data, Material Samples, and the Manufacturer's Certificate of Compliance, executed by one of our LNQA Engineers. While the LNQA Engineer performed an inspection and approved the workmanship of the towers with signatures, including signed submittal forms acknowledging compliance with the contract, the USACE Government employees did NOT take possession of the Transmission Lines or any other part of the work. Consequently, on this contract, the Government did not elect to take partial possession of the Transmission Lines in July 2017, or later the substation in October 2017, as noted in the SIGAR report. It appears that SIGAR incorrectly relied on a submittal form (ENG 4025) typically used to request approval on quality and workmanship issues, which contained a statement from an individual not authorized to accept ownership of a contract. USACE's standard process is to send a letter to the contractor when all inspections have occurred on a contract, after the Government is satisfied that the work is substantially complete, establishing an official completion date. The start of the warranty period is also identified in that notification letter. This action by USACE has not taken place and no final acceptance has been duly issued on behalf of the U.S. Government. Accordingly, the warranty period for the contract has not yet begun.

SIGAR Comment 4

After a meeting between the Afghanistan District Commander, Program Staff and the Office of the Afghanistan President, an agreement was made to provide additional training and more deliberate inspections of the contract features before transferring the

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project. These actions were directed to ensure a smoother, safer transition and afford a greater opportunity for successful operation by the Afghans.

b. Page 4. The second paragraph says USACE did not implement its own plan to suspend or terminate the NEPS III contract. USACE did not need to do so as it was able to partner with the contractor and residents to construct the lines.

SIGAR Comment 5

c. Page 5. The last paragraph is incorrect – USACE did not speculate that it would take several years to resolve the private land issue.

SIGAR Comment 6

d. Page 6. SIGAR found that the NEPS III transmission line was not connected to the Nejrab Substation (SS). The NEPS III system was envisioned to connect to the Nejrab Substation, which was under construction at the time by the French. Because the Nejrab Substation is actually supplied by power from another source, the Naghlu hydropower plant, it would result in power entering the station from two separate sources. Provisions by the French for accepting a second source of power at the Nejrab SS (from NEPS III) were never finalized, nor necessary to provide power along the entire route of NEPS III. While substantial improvements or changes to the contract would have been necessary to connect the transmission lines to the Nejrab SS, those improvements were considered outside the scope of USACE's contract, and would only provide redundancy in the system. While SIGAR seems surprised that a connection was not made, regardless, the lack of a connection has no impact on the ability to provide power along the entire length of the NEPS III project.

SIGAR Comment 7

e. Page 7. SIGAR's report leads the reader to believe the actual T-Connection is unsafe or risky. The physical connection of the transmission lines were made with a mechanical connector that is common, reliable, and consistent with standard construction practices for joining conductors. There is no line de-rating or restrictions necessary for the installed conductors along the NEPS III transmission lines due to the final connections. While the connections are intended to be temporary until a new switch yard is constructed, they are durable, weather resistant and anticipated to be reliable for decades

SIGAR Comment 8

f. Page 8. SIGAR's report leads the reader to believe the T-Connection to the existing grid is unsafe or improper. Under the NEPS III contract it was anticipated that USACE would source its power from the Charikar Substation. In a mature electrical grid, the physical connection would be made in an outdoor line bay, with controls for the line bay inside a control building. The expansion of facilities at Charikar, required for the NEPS III connection were not part of the USACE contract or under USACE oversight. As USACE neared completion of the NEPS III project it became apparent there was no line bay or switch yard to connect to for power at Charikar. USACE, in agreement with MEW/DABS, connected the transmission lines from NEPS III to the transmission lines exiting at the Charikar Substation switch yard.

SIGAR Comment 9

U.S. Army Corps of Engineers (USACE) Response to Special Inspector General for Afghanistan Reconstruction (SIGAR) Draft Report (Project Code SIGAR-I-041), Afghanistan's North East Power System Phase III: US. Army Corps of Engineers Mismanagement Has Resulted in a System that Is Not Energized and May Be Structurally Unsound and Unsafe

While this arrangement was not the preferred method, it was not unsafe. SIGAR included statements in the draft report such as "USACE did not direct ZNCC to make any plans to establish a **SAFE** [Emphasis added] and permanent connection, called a line bay connection" leads the reader to believe that what was constructed was unsafe. SIGAR assumes that connecting to the Charikar Substation line bay provides less risk and more redundancy; and therefore, USACE should have connected to the line bay. This is a false argument. In this instance, there was no line bay available at Charikar to connect to, nor was USACE authorized to build a line bay.

g. Page 9. First Sentence. SIGAR states "USACE stated that any electrical faults occurring between the Charikar and Gulbahar substations, such as a power surge or a short circuit resulting from a damaged conductor, would travel along the Mazar-Kabul transmission line and continue until the fault encountered a substation with circuit breakers or other protective electrical equipment." To put this in perspective, SIGAR's concern is less about life & safety, but rather about convenience for operations and maintenance (O&M). While the O&M concern was theoretically possible many months ago, the Chimtala Substation (south of Charikar) was brought online and constrains the T-Connection and NEPS III Transmission line between two fully operational substations. This means that should a fault occur on NEPS III, the fault investigation would be limited between the two substations and would not require a search for the fault all the way to Kabul as suggested. Further, the NEPS III transmission line and T-Connection were never operated without this additional substation in service.

SIGAR Comment 10

h. Page 9. CSTC-A Engineer was incorrect that the T-connection would increase the probability of an electrical fault. Recommend deletion.

SIGAR Comment 11

i. Page 9. The DABS personnel were incorrect in stating that energizing the line with a T-connection could cause an explosion in the substation yard. There would have to be a fault other than the T-connection to cause an explosion. Recommend deletion.

SIGAR Comment 12

j. Page 10. First paragraph required the contractor to 'make safe' and not just lock up equipment. **MEW officials fourth comment** is not accurate as recorded as use of the transmission lines will occur before full Right of Way (ROW) clearance is completed. Only the obstructions closer than the safety tolerance are required prior to energizing.

SIGAR Comment 13

k. Page 12. Report Photos 6 and 7. SIGAR's report leads the reader to believe the foundations for the towers were crumbling and at risk. SIGAR reported that "ZNCC added concrete to the tops and sides of the originally poured tower foundations. This added concrete, according to SIGAR, exhibited faulty workmanship, such as exposed rebar, and has started to crumble, raising questions about whether the original foundation complied with the contract requirements and whether the strength of the tower foundations has been compromised. SIGAR further provides a photo of an

SIGAR Comment 14

U.S. Army Corps of Engineers (USACE) Response to Special Inspector General for Afghanistan Reconstruction (SIGAR) Draft Report (Project Code SIGAR-I-041), Afghanistan's North East Power System Phase III: US. Army Corps of Engineers Mismanagement Has Resulted in a System that Is Not Energized and May Be Structurally Unsound and Unsafe

unidentified tower with poorly consolidated concrete on top of a footing. While SIGAR never identified what specific towers that were representative of this condition, USACE investigated the accusation and determined this statement is inaccurate. USACE's field representative advised that due to theft of grounding rods and grounding conductors at each footing, the contractor would batch a small amount of concrete and place it over the ground rod adjacent to the footing and over the conductor that attached to the leg of the tower. While this action did not result in well formed, well consolidated concrete, it served its purpose of stopping theft. In regards to the apparent rebar, it is USACE's belief that this is the grounding rod. USACE representatives emphatically stated that the concrete topping had no structural purpose. See USACE's response to recommendation 1 on page 3 of this document for USACE photos.

I. Page 14. SIGAR does not understand that our LNQA's have no contractual authority to accept completed construction on behalf of USACE. Such authority belongs to the USACE Contracting Officers. SIGAR's allegation that USACE disregarded sound acquisition principles is inaccurate.

SIGAR Comment 15

m. Page 22. USACE's Poor Oversight. In this discussion SIGAR faults USACE Government personnel for being unable to visit the construction sites to view the transmission towers and lines. However, the report suggest that SIGAR visited the Gulbahar substation and 18 of the 182 transmission towers between the Charikar and Nejrab substations. SIGAR auditors are similarly constrained, like USACE Government personnel in that neither are able to visit the construction sites themselves. Both agencies relied heavily on local national quality assurance representatives. USACE utilized a Personal Services Contract for on-site quality assurance. USACE Afghan engineers and construction professionals provided daily quality assurance/site inspection of transmission line/tower construction activities, to include observing tower foundation placement, providing pictures of placed foundations at various stages; receiving tower foundation concrete quality assurance laboratory test results which were then reviewed by USACE engineers for contract compliance; completing tower construction checklists to ensure towers were constructed in accordance with accepted designs; receiving, reviewing, and commenting on the contractor's daily Quality Control reports on construction activities, and providing their own daily Quality Assurance reports denoting their observations and findings.

SIGAR Comment 16

n. Page 23. Further, although the NEPS III contract required ZNCC to build transmission towers and lines, USACE did not include a requirement for the contractor to connect the lines permanently to the system's intended power source. This statement is factually incorrect. The contractor would have connected to the line bay if one had been constructed by other donors as originally planned.

SIGAR Comments 2 and 7

SIGAR's Response to the U.S. Army Corps of Engineers' (USACE) Comments

SIGAR Comment 1: We recognize that there were challenges to completing the North East Power System phase III (NEPS III). However, as noted in our report, USACE allowed Zwakman Nabizai Construction Company (ZNCC) to proceed with the construction and did not implement its own plan to suspend or terminate the NEPS III contract despite the unresolved land-acquisition and right-of-way issues. In addition, USACE directed ZNCC to make a temporary connection to a non-energized transmission line outside the Charikar substation in an attempt to meet the contract requirement for NEPS III to deliver power. As a result of USACE actions, NEPS III is not operational. At USACE's direction, ZNCC has now disabled the NEPS III equipment so the system cannot be used, and USACE plans to turn NEPS III over to U.S. Forces–Afghanistan (USFOR-A), which will subsequently turn it over to the Afghan government. The warranties will probably expire before the system can be fully tested, commissioned, and energized, and either the U.S. or Afghan government will have to spend additional funds to address any problems encountered thereafter.

SIGAR Comment 2: We agree that better coordination is needed, but our report only addresses the NEPS III project, not the U.S. and international effort to build the rest of NEPS or Afghanistan's power grid. We do not suggest that USACE should be solely responsible for this broader effort. The Afghanistan Power Sector Master Plan notes that developing the country's electrical system will involve multiple projects. NEPS III is just one of these projects. Instead, we note that USACE officials told us that they removed requirements to construct the Charikar substation from the NEPS III contract in September 2012 after learning that the Indian government would build the substation. However, USACE never added a contract requirement for connecting NEPS III to the Charikar substation and did not direct ZNCC to make the temporary connection until 3 years after the contract began. This has contributed to NEPS III not being operational.

SIGAR Comment 3: We agree that the French and Indian governments were responsible for building the Nejrab and Charikar substations, respectively. Our finding is that USACE did not include specific provisions in the NEPS III contract to connect the system to either of those two substations, despite the contract requiring the system to deliver power to both of them. As we noted, it was not until December 2016, over 3 years after the construction of NEPS III began, that USACE directed ZNCC to connect the system to the Charikar substation. When we asked why this occurred, USACE responded as discussed in our report by noting that the French and Indian governments had agreed to construct line bays for permanent connection but have not done so. However, USACE did not provide us with any documentation to support these statements. Because the Power Sector Master Plan does not specify how the various projects being completed will be connected or by whom, we attempted to obtain this information from the French and Indian governments. The French embassy in Kabul had not responded to our request as of the date of this report, and we were not able to identify relevant officials with the Indian embassy in Kabul.

SIGAR Comment 4: We disagree with USACE's claim that we incorrectly relied on a USACE document that included statements from an individual not authorized to accept ownership of the NEPS III project. Our draft of this report included statements regarding final acceptance inspections and warranty dates obtained from documentation USACE provided to us in November 2017. These documents, titled "Final Acceptance Inspection," stated, among other things, that the final inspections had been completed, no deficiencies had been identified, and the warranty period began the date of the inspection, which was July 26, 2017, for the transmission towers and October 2, 2017, for the Gulbahar substation. The USACE Project Engineer subsequently approved the inspections. However, based on documentation received in response to a draft of this report, which stated that ZNCC and local national quality assurance (LNQA) officials re-inspected the project in January 2018, and Ministry of Energy and Water (MEW) and Da Afghanistan Breshna Sherkat (DABS) officials inspected the project starting January 20, 2018, we are removing this section of the report.

SIGAR Comment 5: The NEPS III project management plan stated that the project could be suspended or terminated for convenience if land-acquisition presents a challenge, and USACE acknowledged that the Afghan government did not acquire any private land along the construction route. USACE indicates that it was able to

partner with the contractor and residents to construct lines. However, we reviewed extensive project documentation that USACE provided discussing challenges to completing the NEPS III project due to the unresolved land-acquisition and right-of-way issues. Further, USACE did not provide any documentation to show that land-acquisition and right-of-way issues were addressed as required by the NEPS III contract or the memorandum of understanding it signed with the Afghan government.

SIGAR Comment 6: During our July 2017 interview with the USACE Project Engineer for NEPS III, the individual estimated that it would take 18 months to resolve land-acquisition issues and acknowledged it could take several years

SIGAR Comment 7: See comment 3.

SIGAR Comment 8: We did not complete an independent assessment of the safety or reliability of the temporary connection, or T-connection, between NEPS III and the Charikar substation. Instead, we cite statements made by NEPS III stakeholders, including a Combined Security Transition Command–Afghanistan (CSTC-A) engineer, ZNCC officials, and two USACE officials, expressing concerns about the reliability of using a T-connection to connect the NEPS III project to the Charikar substation.

SIGAR Comment 9: As noted in our report, a power connection made without using a line bay in a power substation results in unprotected power lines, which could lead to power outages that affect large geographic areas, including the city of Kabul. See comment 8.

SIGAR Comment 10: The statement USACE makes refers to comments from a memorandum a USACE program manager sent to USFOR-A officials regarding the geographic location that could be affected by an electrical fault occurring along NEPS III transmission lines. We did not conduct an independent assessment to determine the impact of a power surge.

SIGAR Comment 11: We disagree that the CSTC-A engineer's comments should be deleted. We included the engineer's statement because command officials invited him to the meeting as a subject matter expert on power transmission systems. Further, his statements are consistent with concerns raised by USACE, MEW, and ZNCC officials regarding the use of a T-connection to connect the NEPS III transmission lines to the Charikar substation. As we noted in our report, USACE and CSTC-A officials have said that this type of connection increases the risk of a power outage to other portions of the grid that are actually operational if a system fault occurs.

SIGAR Comment 12: We disagree with that the DABS's statement should be deleted. First, DABS technical officials stated that ZNCC did not notify DABS officials at the Charikar substation before it installed the T-connection or take any steps to coordinate with those officials to ensure the connection would be safely made. Further, CSTC-A officials told us that neither they nor USACE had ever visited the Charikar substation to determine if its operation was compatible with requirements to power the NEPS III system. Therefore, it is unclear how USACE can definitively state that such an explosion could not occur.

SIGAR Comment 13: It is unclear what USACE is referring to in this comment.

SIGAR Comment 14: We reported on the results of our inspection of the 18 towers we could visit and found that some foundations had an additional layer of crumbling concrete that was not compliant with the NEPS III contract. Therefore, it is still reasonable for USACE to inspect all of the towers to ensure they comply with the contract.

SIGAR Comment 15: We disagree with USACE's assertion. Our draft report notes that the USACE Project Engineer approved the LNQA official's inspections and acceptance of the transmission towers, lines, and substation, which included statements noting that the warranty periods had begun.

SIGAR Comment 16: Since we did not assess USACE's oversight throughout the project, we revised this report to discuss USACE documentation containing contradictory and confusing information regarding final inspections of the NEPS III system as well as contradictory documentation from USACE regarding when the project was accepted and the initiation of the warranty period.

APPENDIX III - ACKNOWLEDGEMENTS

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The mission of the Special Inspector General for Afghanistan Reconstruction (SIGAR) is to enhance oversight of programs for the reconstruction of Afghanistan by conducting independent and objective audits, inspections, and investigations on the use of taxpayer dollars and related funds. SIGAR works to provide accurate and balanced information, evaluations, analysis, and recommendations to help the U.S. Congress, U.S. agencies, and other decision-makers to make informed oversight, policy, and funding decisions to:

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