



SIGAR

**Office of the Special Inspector General
for Afghanistan Reconstruction**

December 11, 2014

The Honorable Chuck Hagel
Secretary of Defense

The Honorable Christine E. Wormuth
Under Secretary of Defense for Policy

Dear Secretary Hagel and Under Secretary Wormuth:

I am writing to express my concerns about the safety of a natural gas pipeline in northern Afghanistan which the Department of Defense (DOD) has helped to repair.¹ In the course of conducting an audit of U.S. efforts to develop Afghanistan's extractive industries,² we were informed that the Sheberghan-Mazar pipeline had suffered years of corrosion since being completed by the Soviet Union. The pipeline was operated at low pressures between 2004 and 2011, with neither the Afghan government nor the U.S. taking action to repair or replace corroded or otherwise damaged sections of pipe.

Since 2011, DOD's Task Force for Business and Stability Operations (TFBSO)³ has been engaged in an initiative to rehabilitate the 89.1 kilometer pipeline,⁴ but the project is not yet complete and TFBSO will soon cease its work in Afghanistan.

In a June 28, 2004, report, Sofregaz—a France-based engineering company specializing in natural gas—presented the results of its evaluation of Afghanistan's gas transmission and distribution infrastructure. Sofregaz's report noted high leakage rates along the Sheberghan-Mazar pipeline resulting from "corrosion, poor design, low quality welding and a lack of proper pipe supports."⁵ According to Sofregaz, these deficiencies created the conditions for catastrophic failure, although the report noted that the danger of this happening was mitigated by the pipeline's low operating pressure.

¹ Because of our concerns about the safety of the pipeline, we sent an earlier draft of this letter to TFBSO alerting it to our concerns and to obtain its comments, which we have incorporated into this letter.

² SIGAR plans to issue the audit of U.S. efforts to develop Afghanistan's extractive industries in January 2015. The audit's objectives are to (1) describe the U.S. initiatives that support the development of Afghanistan's extractive industries, (2) identify the approaches and strategies guiding U.S. government support for Afghanistan's extractive industries since 2009, and (3) determine the extent to which U.S. initiatives designed to assist in the development of Afghanistan's extractive industries incorporated sustainment planning and identify challenges to sustainment.

³ TFBSO is a temporary division of DOD, established in 2006, to stabilize the post-invasion economies of Iraq and Afghanistan, reduce unemployment, and attract foreign investors.

⁴ The Sheberghan-Mazar pipeline connects the Khoja Gorgordak natural gas field near Sheberghan, Jowzjan province to the Northern Fertilizer and Power Plant in Mazar-e-Sharif, Balkh province.

⁵ Sofregaz, *Energy Sector Review and Gas Development Master Plan*, Activity 4.2: Gas Transmission and Distribution Infrastructure, June 28, 2004.

The Sofregaz report recommended an assessment of the Sheberghan-Mazar pipeline to identify the level of leakage and the condition of the pipeline, as well as the development of a repair policy and the replacement of heavily affected sections. Between March 25, 2012 and April 2, 2012, Afghan Gas Enterprise (AGE) engineers conducted ultrasonic tests at 29 points along the Sheberghan-Mazar pipeline using a testing device and collection methodology provided by TFBSO.⁶ Based on this data, TFBSO's pipeline subject matter experts determined that while some sections of the pipeline showed evidence of corrosion, the pipeline walls were generally thick enough to sustain a significant pressure increase, which would increase natural gas throughput from the Khoja Gorgordak gas field to the Northern Fertilizer and Power Plant in Mazar-e-Sharif. However, the TFBSO analysis also noted that the pipeline condition warrants eventual replacement. As a result, on August 24, 2012, TFBSO procured 15 kilometers of pipe for AGE to use in replacing corroded sections of the pipeline and supporting pressure increases. By October 10, 2014, AGE had connected 12 of the 15 kilometers of pipe with TFBSO guidance and support, including training at selected work sites. TFBSO ceased field operations in Afghanistan on November 21, 2014, and is no longer able to assist AGE in replacing the remaining 3 kilometers of pipeline or maintaining the pipeline.

U.S. Officials Have Expressed Concerns about the Pipeline's Safety

U.S. Agency for International Development (USAID) and U.S. Embassy Kabul officials have expressed reservations about TFBSO and AGE's Sheberghan-Mazar pipeline project. USAID and U.S. Embassy officials told us that the full extent of corrosion is unknown because TFBSO's analysis only tested 29 discrete sites rather than the full length of the pipeline. Those officials also expressed concern that AGE would not be able to complete the pipeline's rehabilitation before TFBSO ceased operations in Afghanistan. The officials stated that, by leaving AGE to complete the work without TFBSO assistance, the Afghan government would likely blame the U.S. if a catastrophic failure occurs along the pipeline.

Further, according to the Sofregaz report, TFBSO, and U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) officials, the pipeline does not contain a cathodic protection system.⁷ Sofregaz noted the lack of cathodic protection means that it is almost impossible to evaluate the state of internal and external corrosion on the lines. A PHMSA official recommended that TFBSO consider procuring and installing a cathodic protection system when installing the replacement pipes. TFBSO agreed to consider the recommendation, but ultimately decided not to install a cathodic protection system because it would be prohibitively expensive and time-intensive to install, it might not be necessary given the lack of surface corrosion observed by AGE engineers, and integrating systems to remove free liquids should provide sufficient protection against internal corrosion.⁸ However, TFBSO officials previously told SIGAR they had recommended that AGE conduct soil resistivity tests and install cathodic protection systems for any new pipeline it may construct in the future.⁹

TFBSO officials held informal conversations with PHMSA in March 2014 to address USAID and U.S. Embassy concerns. According to a PHMSA official, these discussions outlined steps that TFBSO and

⁶ AGE is the national gas utility that owns and operates Afghanistan's natural gas infrastructure. It is a component of the Ministry of Mines and Petroleum.

⁷ Cathodic protection is a technique used to protect a metal surface from corrosion. One simple method, considered by TFBSO for the Sheberghan-Mazar pipeline, is to apply a more easily corroded metal to a pipeline to be consumed in place of the pipeline, serving as a "sacrificial anode."

⁸ Free liquids, such as water and natural gas condensate, are a common cause of internal pipe corrosion.

⁹ Soil resistivity is a measure of how much the soil resists the flow of electricity. The less resistive the soil is in the areas that a pipeline is built, the more corrosive that soil will be for the pipe.

the Afghan government should take to meet safety standards for U.S. pipelines, with recommendations centering on the development of a methodology for testing for leaks along the entire pipeline and replacing damaged sections. Based on these conversations, TFBSO procured a PHMSA-recommended gas leak detector for use by AGE. TFBSO also agreed to recommend that AGE wait until all replacement pipes were installed before incrementally increasing the operating gas pressure in the pipeline and using the gas leak detector to test for leaks along the entire length of the pipeline after each increase in pressure. Finally, TFBSO agreed to ensure that, at a minimum, low point drains would be installed to remove free liquids in the pipeline.

It appears that the steps TFBSO agreed to take in response to USAID, U.S. Embassy, and PHMSA concerns will help ensure that the pipeline is safe for continued use. However, we remain concerned that AGE lacks the capacity to complete installation of the remaining 3 kilometers of replacement pipe, incrementally increase pressure while checking for leakages, and perform future maintenance without continued support and guidance. U.S. Embassy officials have echoed our concern, and stated that AGE lacks the materials and expertise to properly survey the pipeline and repair leaks as they are discovered.

In a draft of this inquiry letter, I asked TFBSO to respond to the following questions:

- Will AGE be able to complete tie-ins for the remaining 3 kilometers of replacement line before TFBSO ceases operations on November 21, 2014? If not, what assurances does TFBSO have that AGE will be able to complete this project without TFBSO assistance?
- What assurances does TFBSO have that the pipeline does not require cathodic protection? Please describe any other methods that are being used to monitor and control corrosion of the pipeline?
- What length of the rehabilitated Sheberghan-Mazar pipeline has been surveyed/tested for leaks since 2004? What were the results of these surveys/tests?
- What will be the impact on the illegal taps in the existing pipeline when the gas pressure is increased?
- Please confirm that AGE has received the requisite training to operate the gas leak detector provided to them by TFBSO, and to properly interpret the resulting data. Given the capacity and security concerns, what assurances are there that AGE will use the gas leak detector to survey the full length of the pipeline without TFBSO support and oversight?
- What assurances are there that AGE will follow the methodology recommended by PHMSA for incrementally increasing gas pressure and surveying the pipeline for leaks? Does AGE have the capacity to repair gas leaks as they are discovered during pipeline surveys?
- What assurances are there that AGE has the capacity and willingness to perform necessary operation and maintenance work on the gas pipeline?

TFBSO's Response to the Inquiry Letter

TFBSO responded to the draft letter on December 3, 2014, with both technical comments and answers to the questions, the former of which have been incorporated into the letter, as appropriate. A copy of TFBSO's technical comments and answers are included in enclosure I.

In its technical comments, TFBSO pointed out that our draft included a statement describing a portion of pipeline in Afghanistan on which TFBSO did no rehabilitation work. We have deleted that statement. The pipeline that TFBSO did work to repair—named the “Khwaja Gogerdag –Khudberg” pipeline in the Sofregaz report and referred to as the “Sheberghan-Mazar” pipeline in this letter—has a number of safety concerns, as highlighted by the Sofregaz report, as well as by officials from USAID, the U.S. Embassy, and the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration.

In general, TFBSO’s answers to our questions were satisfactory and describe its repair and capacity building efforts. According to TFBSO’s response, the 12 kilometers of the pipeline that it replaced accounted for the majority of the leaks, and TFBSO notes that it successfully assisted the AGE in tying in two sections of pipeline with the AGE independently tying in four of five remaining sections. However, the final section has yet to be tied in because of security concerns and the departure of security forces from the area.

Additionally, TFBSO states that due to the temporary nature of this pipeline’s operation, its low operating pressure, and the addition of systems to remove free liquids, a cathodic protection system was deemed unnecessary as long as periodic leak surveys were conducted. However, TFBSO officials have previously recommended that any new pipeline built in Afghanistan be fitted with a cathodic protection system and have AGE conduct soil resistivity tests.

Finally, although TFBSO’s response to this inquiry letter details a variety of capacity building efforts, we remain concerned about the AGE’s ability to properly survey the pipeline. TFBSO states in its response that the “entire 89.1 kilometer of pipeline is regularly surveyed for leaks by the AGE through direct assessment methods.” However, TFBSO’s response goes on to state that there are insecure areas that prevent AGE from conducting leakage surveys. Despite this, TFBSO expects AGE to survey the pipeline “as necessary and as security conditions allow.” Regardless of the reason, AGE’s inability to fully inspect the pipeline is cause for concern.

I made this request pursuant to my authority under Public Law No. 110-181, as amended, and the Inspector General Act of 1978, as amended.

Sincerely,



John F. Sopko
Special Inspector General
for Afghanistan Reconstruction

cc: Mr. Joseph Catalino, Jr.
Acting Director, Task Force for Business and Stability Operations

Enclosure I: Task Force for Business and Stability Operations’ Response to SIGAR 15-15-AL, dated December 3, 2014

ENCLOSURE I: TASK FORCE FOR BUSINESS AND STABILITY OPERATIONS' RESPONSE TO SIGAR 15-15-AL, DATED DECEMBER 3, 2014



DEPARTMENT OF DEFENSE
Task Force for Business and Stability Operations
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The Honorable John F. Sopko
Special Inspector General for Afghanistan Reconstruction
1550 Crystal Drive, 9th Floor
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Dear Mr. Sopko,

Thank you for your letter dated November 3, 2014, regarding the Task Force for Business and Stability Operations' (TFBSO) assistance to the Afghan Gas Enterprise's (AGE) project to rehabilitate a natural gas pipeline in northern Afghanistan. After evaluating your letter and TFBSO's records, I am responding on behalf of the Secretary of Defense. It is unclear whether the 2004 Sofregaz report you reference, which is the basis of many of your concerns, is describing the same pipeline that the TFBSO was helping to repair.

In an effort to connect Afghan industries reliant on foreign fuels with Afghanistan's natural gas resources, TFBSO engaged with the AGE to rehabilitate the Sheberghan-Mazar natural GAS pipeline to supply natural gas to Mazar-e-Sharif.

According to the Sofregaz report, "The pipeline to Mazar-i-Sharif is known to be leaking badly and combined with its aboveground location in close proximity to a major highway makes this pipeline a serious safety hazard. In addition, it is reported that there are numerous illegal tapings and the pipe supports are wholly inadequate." However, this description is not consistent with the Sheberghan-Mazar pipeline, which is underground, avoids populations, is not near a major highway, and is not known to have illegal taps.

Despite this discrepancy, TFBSO has carefully reviewed your letter and addressed your questions below. TFBSO is currently transitioning its part of the Sheberghan-Mazar project to the Afghan Ministry of Mines and Petroleum (MoMP).

- **Will AGE be able to complete tie-ins for the remaining 3 kilometers of replacement line before TBFSO ceases operations on November 21, 2014? If not, what assurances does TFBSO have that AGE will be able to complete this project without TFBSO assistance?**

TFBSO assisted the AGE with the tie-in of two of the seven replacement sections of the pipeline, with the expectation that AGE would tie-in the remaining five sections. AGE has

successfully tied in four of the five sections independently without incident. Security concerns in the area and the recent relocation of Afghan National Security Forces to another high-priority area have delayed the AGE with the tie-in of the last section. Although TFBSO will not be present for the tie-in of the seventh section AGE's demonstrated ability suggests that it should be able to complete the last section without assistance.

- **What assurances does TFBSO have that the pipeline does not require cathodic protection? Please describe any other methods that are being used to monitor and control corrosion of the pipeline?**

Cathodic protection is a technique used to control the corrosion of a metal surface and is considered a requirement in the United States if a corrosive environment exists and if the pipeline is intended to operate as a permanent line. The Sheberghan-Mazar pipeline was assessed by TFBSO's subject matter experts (SMEs) and was considered a primary risk for corrosion at points with liquid accumulation. Sections of the pipe where liquids could accumulate were replaced and liquid knockout separators were restored to operational status. It is important to note that AGE only plans to operate the rehabilitated pipeline temporarily. Due to an expected increase in demand, a new pipeline has already been designed and pipe is currently being staged in Sheberghan and Mazar-e-Sharif for eventual construction. Once the new pipeline is complete, the existing line will operate with minimal pressure. Based on this information, TFBSO SMEs and outside reviewers, including the Pipeline and Hazardous Material Safety Administration (PHMSA) representative at the U.S. Department of Transportation, deemed cathodic protection unnecessary as long as periodic leak surveys were conducted.

- **What length of the rehabilitated Sheberghan-Mazar pipeline has been surveyed/tested for leaks since 2004? What were the results of these surveys/tests?**

The entire 89.1 km of pipeline is regularly surveyed for leaks by the AGE through direct assessment methods. The 12 km of recently installed replacement pipe was hydrostatically tested prior to installation and surveyed for leaks post-installation with methane detectors. Additionally, the AGE reports that they conduct regular surveys using the methane detectors in areas deemed higher risk. During the last three years, AGE has repaired an average of five pipeline leaks per year. The majority of leaks occurred in the 12 km that have since been replaced.

Additionally, your letter states, "Sofregaz's report noted high leakage rates along the Sheberghan-Mazar pipeline resulting from 'corrosion, poor design, low quality welding and a lack of proper pipe supports.'" However, the Sofregaz report also states, "...it is almost

impossible to evaluate the state of internal and external corrosion on the lines. The only evidence that exists on the state of the lines is the anecdotal evidence of gas leakage...”

Using transmission pipeline flow equations, engineers contracted by TFBSO calculated that the flow was consistent with a pipeline without leaks. TFBSO’s petroleum and pipeline engineers determined that reduction in gas volume is attributed to reduced reservoir flowing pressure, as opposed to leakages and taps.

- **What will be the impact on the illegal taps in the existing pipeline when the gas pressure is increased?**

The evidence of illegal taps appears to come from the Sofregaz report referenced in your letter. TFBSO is not aware of illegal taps on the Sheberghan-Mazar pipeline.

- **Please confirm that AGE has received the requisite training to operate the gas leak detector provided to them by TFBSO, and to properly interpret the resulting data. Given the capacity and security concerns, what assurances are there that AGE will use the gas leak detector to survey the full length of the pipeline without TFBSO support and oversight?**

TFBSO SMEs have conducted on-site training for the gas detectors with AGE engineers to test for gas leaks. The training included operations as well as proper calibration and set up procedures. The data outputs are simple aural and visual indications that limits have been exceeded and are easily interpreted by AGE personnel.

Although there are areas of specific security concerns in Jowzjan and Balkh, these areas are not populated and the AGE is expected to survey the line as necessary and as security conditions allow. The AGE has assured the TFBSO that it has been surveying the line since its construction and there is no indication that it will cease these procedures now that it has more effective tools.

- **What assurance is there that AGE will follow the methodology recommended by PHMSA for incrementally increasing gas pressure and surveying the pipeline for leaks? Does AGE have the capacity to repair gas leaks as they are discovered during pipeline surveys?**

At this time, the AGE does not expect to increase operating pressure above the 2012 pressure until the AGE has additional demand and an associated operations and maintenance (O&M) contract to operate the processing equipment. An O&M company will increase gas pressure

consistent with PHMSA recommendations and industry best practices. The AGE does not currently have the technical capacity to increase gas pressure without specialized technical assistance. The AGE does have the capacity to repair gas leaks when they are discovered during pipeline surveys.

- **What assurance is there that AGE has the capacity and willingness to perform necessary operation and maintenance work on the gas pipeline?**

The AGE has been performing necessary operation and maintenance work since the construction of this pipeline. The operations and maintenance requirements of the pipeline itself are no more complex than the previous requirements.

Thank you for your interest in this matter.

Sincerely,



Joseph Catalino
Acting Director
Task Force for Business and Stability Operations