April 4, 2013

Lieutenant General Thomas P. Bostick
Commanding General and Chief of Engineers
U.S. Army Corps of Engineers

An urgent safety matter has come to my attention that I believe requires immediate action. Specifically, USACE officials have decided to continue using foam insulation and thermal barrier systems in the construction of K-Span structures for the Afghan National Army (ANA), despite knowledge that, if improperly installed, these materials pose a serious fire and life safety risk.[1]

Last year, three K-Span structures built for the ANA caught fire during construction, resulting in property damage.[2] USACE recently examined this matter and issued a decision paper, updated March 10, 2013, that found these fires were linked to the foam insulation and thermal barrier systems used by contractors in constructing K-Span structures (see enclosure).[3] Allegedly, the contractors installed foam insulation and thermal barrier systems that were not compliant with International Building Code (IBC) standards. USACE determined that a potentially serious fire and life safety hazard exists with ANA K-Span facilities in which foam insulation systems were not properly installed in accordance with IBC standards. USACE identified three categories of ANA K-Span structures affected by this fire and life safety risk:

- structures with the foam insulation and thermal barrier systems already installed,
- structures currently in various stages of construction in which the foam insulation or thermal barrier system is in the process of being installed, and
- recently awarded contracts for which the application of foam insulation or thermal barrier products has not yet been installed.

I am troubled that USACE's risk assessment determined that "almost all of the completed facilities have insulation installed that currently can not be shown to meet the requirements of the IBC code." In fact, according to USACE, for two contracts consisting of forty-five (45) structures with completed systems installed, only "one is in full compliance" with IBC standards. USACE determined the most appropriate course of action to respond to this potential fire and safety risk was to place fire safety warning cards within K-Span structures, "along with a 'fire-watch' during rest hours."

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[1] According to a DOD document, K-Span is a rust resistant, weather resistant, and fireproof structure. According to USACE's decision paper, K-Span structures replaced concrete/masonry structures for many ANA projects in the 2010 timeframe. Contract specifications required foam insulations with a cementitious thermal barrier that meets International Building Code requirements.

[2] USACE documents reported that one of the fires resulted in $400,000 in property damage and another resulted in an estimated $388,000 in property damage.

[3] US Army Corps of Engineers, Afghanistan District South (TAS), "Decision Paper. Subject: Afghanistan Engineer District – Afghan National Army (ANA) K-Span Foam Insulation and Thermal Barrier System for Completed and On-going Structures" (Afghanistan: updated March 10, 2013).

USACE estimates that in southern Afghanistan alone, there are "approximately 1,002 K-Span structures in various stages of construction," for eventual use by the ANA. Alarmingly, "704 structures are in various stages of installation of the foam insulation and barrier system" that USACE has identified as non-compliant with IBC standards. An additional "298 structures do not have the insulation or thermal barrier systems in place." To avoid further expense and delays in project completion dates, USACE guidance to contractors for any structures that do not yet have systems fully in place is to "proceed with the materials that have been previously approved and that are currently on site."

Given the safety risk to the ANA troops who occupy facilities in which non-compliant materials are likely to have been used as well as the number of K-Span facilities under construction, we are alerting you to our concern over this serious fire and life safety risk. We are requesting you to immediately reconsider the decision to continue using IBC non-compliant insulation foam and thermal barrier systems for K-Span facilities currently under construction. Please report to us once this has been done.

In the meantime, SIGAR has opened an investigation into this matter. In support of that investigation, this issue is being reviewed by our Special Projects Office. Therefore, I request that USACE provide my staff with all information and supporting documentation on the decision to continue using IBC non-compliant foam insulation and thermal barriers systems in completed, current, and upcoming construction projects. We also request copies of all inspection reports, fire reports, and assessments pertaining to these K-Span buildings, as well as documentation regarding the risk assessment and decision made to use K-Span structures and related code requirements in the construction of ANA facilities.

To the extent that the construction projects for the Afghan National Police (ANP) also contain K-Span facilities, we are requesting similar information, including the number of ANP contracts calling for K-Span facilities, the number of facilities completed and in various stages of construction, and any risk assessments or mitigation measures conducted to address fire or life safety issues.

Should you or your staff have any questions or need additional information, please contact Monica Brym, Director of Special Projects, at [redacted]. Thank you in advance for your cooperation.

John F. Sopko
Special Inspector General
for Afghanistan Reconstruction

Enclosure

CC:
General Lloyd J. Austin III, Commander, U.S. Central Command

General Joseph F. Dunford, Jr., Commander, U.S. Forces–Afghanistan and
Commander, International Security Assistance Force

Lieutenant General Daniel P. Bolger, Commanding General, NATO Training Mission-Afghanistan/
Combined Security Transition Command-Afghanistan

DECISION PAPER

SUBJECT: Afghanistan Engineer District – Afghan National Army (ANA) K-Span Foam Insulation and Thermal Barrier System for Completed and On-going Structures

DATE: Updated 10 March 2013

LOCATION: ANA Projects in Afghanistan

PURPOSE: To recommend courses of actions for the three various scenarios that exist on both the TAN and TAS contracts.

CURRENT STATUS:

- Transatlantic District North and South **(**TAN) and (TAS) have a potential life safety/fire safety issue regarding the form insulation and thermal barrier system installed on some of the K-Span buildings on ANA projects.

- TAN and TAS have three categories of structures: (i) Structures that have the foam and thermal barrier products installed *(Reference Figures B-1 and B-2)*; (ii) Structures that are currently in various stages of construction with the application of a form and or thermal barrier product with submittals being provided *(Reference Figure B-3)*; (iii) Recently awarded contracts for which no submittals have been provided *(Reference Figure B-4)*.

- TAS currently has twenty-one (21) contracts for ANA projects that have approximately 1,002 K-Span structures in various stages of construction.

    - Eleven contracts consisting of seven hundred and four (704) structures are in various stages of installation of the foam insulation and thermal barrier products. The system (Baymar – Polyurethane Insulation and the DC-315 – Fire proof paint) does not meet the IBC requirement *(Reference Tab A-1)*.

    - The remaining ten contracts consisting of two hundred and ninty-eight (298) structures do not have the insulation or thermal barrier systems in place. Nine of these contracts do not have approved or acknowleged submittals regarding the insulation or thermal barrier system *(Reference Tab A-2)*.

- One contract consisting twenty-three (23) strucutres has been completed and is currently occupied by the ANA.

- Two contracts consisting of forty-five (45) structures have completed systems installed; one of which is in full compliance with the code while the only is in partical compliance.

- Serial letters have been sent to each contractor for these ten contracts advising them of the expectations and the requirements of their contracts regarding the foam insulation and thermal barrier. One of the contractors provided their submittal prior to the issuance of the serials letters.

- Several of the contractors have contracts in each of the three primary categories indicated above, the intent is to provide clear and consistent guidance based on the facts that have been identified at this point in time.

- Based on discussions with Mr. Booker on 5MAR, for those K-Span structures with partially installed foam insulation / thermal barrier systems, the guidance is to proceed with the materials that have been previously approved and that are currently on site.

BACKGROUND: Many structures in the ANA projects were changed from concrete/masonry structures to K-Span structures in order to shorten construction periods. The standard designs for these structures were done by Baker Engineering and put into contracts in the 2010 timeframe. The first round of contracts that had K-Span structures in them were released as design-build contracts with the contractors being responsible for the design. These were to be designed and built to meet IBC standards. The second round of contracts were issued with the Baker Engineering produced plans and specifications which required foam insulations and cementitious barriers that met the IBC code. Then there were other contracts that were issued with just the standard Baker drawings and without the specifications. Nevertheless, the drawings still required that the contractor to use IBC approved foam insulation with a cementitious thermal barrier.

Within the last year, three different projects had K-Span structures catch on fire during construction which elevated the awareness that the foam insulation system, if not done in accordance with code and with proper safety measures, potentially pose a serious fire/life safety hazard. Since these fires, extensive research into the code requirements, and validation of what systems have been installed on these structures (Reference Tab A). It has been determined that almost all of the completed facilities have insulation installed that currently can not be shown to meet the requirements of the IBC code. Many of these facilities also do not have thermal barrier systems that can be validated that meet code requirements.

KEY ISSUES/RISKS FOR COURSES OF ACTION (COAs): Issues and risks for the three various stages of construction are as follows:

1. **Completed K-Span structures –**

COA 1 : Remove and replace the non-compliant insulation and thermal barrier systems

- **Impacts / Risks**:
  - *Impact*. Significant delay to BODs with adverse affect on mission requirements. Would need direction from the Division which would also involve coordination with NTMA. Additional funding would be required
  - *Risk*: It is unclear at this time what process would be used to remove the existing materials and potential consequenes associated with it removal.

COA 2: Leave the current system in place and development a risk mitigation program such as the use of placards with the appropriate warning indicated along with a “Fire-Watch” during rest hours.

- **Impacts / Ricks**:
  - *Impact.* Minimal. The subsequent cost associated with the implementation of the risk mitigation program would also be minimal.
  - *Risks*: Potentially significant. Most of the completed K-Span structures, as noted above, do not have insulation and thermal barrier systems that meet the requirements of the IBC code. As such they present a potential fire and life safety hazard. The exact degree of risk would be dependant on the type of insulation used in each structure, the type of thermal barrier, the type of ceiling system, if used, and the function of each building. For instance, the risks would be highest in a barracks facility with no gypsum board ceiling, foam insulation that does not meet IBC code, and with no thermal barrier in place.

2. K-Span structures with partially installed foam insulation/ thermal barrier systems –
COA 1 : Remove and replace the non-compliant insulation and/or thermal barrier system(s)

- **Impacts / Risks**:
  - *Impact*. Significant delay to BODs with adverse affect on mission requirements. Would need direction from the Division which would also involve coordination with NTMA. Additional funding would be required
  - *Risk*: It is unclear at this time what process would be used to remove the existing materials and potential consequenes associated with it removal.

COA 2: Leave the current foam system in place and direct the contractor to apply the IBD code complaint thermal barrier.

- **Impacts / Ricks**:
  - *Impact*. Potentially significant. A majority of these contracts have the materials already on site and have had submittals for either systems initially approved. The reprocurement time and the reallocation of planned activities could impact project completions dates. The extent of delay and costs, if any, would vary depending on the current stage of construction and time required to obtain a new type of approved thermal barrier.
  - *Risk*: It is anticipated that the risk for fire could be reduced, however, the combination of the non-compliant foam and the compliant thermal barrier has not been tested. imilar to completed structures just discussed, K-Span buildings with foams installed

COA 3: Allow the contractor(s) to install the current system for which submittals have been previously submitted and approved. Leave the current system in place and development a risk mitigation program such as the use of placards with the appropriate warning indicated along with a "Fire-Watch" during rest hours.

- **Impacts / Ricks**:
  - *Impact*. Minimal. The subsequent cost associated with the implementation of the risk mitigation program would also be minimal.
  - *Risk*: Similar to the already completed structures just addressed, these K-Span buildings with foam installed that do not meet IBC code will present a potential fire and life safety hazard. As such they present a potential fire and life safety hazard. The exact degree of risk would be dependant on the type of insulation used in each structure, the type of thermal barrier, the type of ceiling system, if used, and the function of each building.

UPDATE: During discussions with Mr. Booker and Mr. Lee on 5 MAR, COA 3 was determined to be the most appropriate course of action with the incorporation of the risk mitigation program.

3. K-Span structures without approved/acknowledged foam insulation or thermal barriers –

COA 1: Direct the contractor(s) to provide and install the code compliant system.

- **Impacts / Ricks**:
  - *Impact*. Minimal. Submittals have not yet been submitted for these contracts. Letter(s) of Direction addressing the code complaint foam and thermal barrier systems have been issued for these contracts.
  - *Risk*: Minimal. Direction has been provided which should allow these recently awarded contracts the ability to incorporate into their schedules the anticipate procurement time of this material.

COORDINATION: **Internal:**

[redacted]

TAB A-1 (List of contracts that have system either completed or currently on-going)

No.	AO	CONTRACT NUMBER	PROJECT NAME	NO. ARCH SPAN BLDGS.	NO. BLDG. INSUL.	NO. BLDG. COATED	REMARKS (as of 1 March 2013)
1	Helmand	W5J9LE-12-0012 NA Mideast Construction	ANA 6/3/215 @ Gereshk Camp Infantry	17	17	0	Product used was Baymer SHPU-40-21. Coasting not approved but DC-315 submitted.
2	Helmand	W5J9LE-11-C-0034 NA Lakeshore TolTest JV	ANA 2/215th Brigade Garrison, Delaram	109	29	29	Foam and coating is on-going
3	KAO	W5J9LE-11-C-0060 NA Lakeshore Toltest Metag JV	ANA 4/205th Brigade Garrison, Phase 1	65	11	11	Both products approved. Contractor submitted SPF's guide.
4	Helmand	W5J9LE-11-C-0045 NA EEC International	ANA 214 utilities, Engineer, QRF Signal	41	30	0	DC-315 proposed.
5	Helmand	W5J9LE-11-C-0043 NA EEC International	ANA 1/215th Brigade Garrison, Garmsir	139	116	115	Foam insulation(2 approved systems)- Baymer SHPU-40-11(A) & Desmodur 44V20L(B) and BASF Electrospray H 1611/31 & Iso PMDI 92140.
6	Herat	W5J9LE-11-C-0018 NA EEC International	ANA 2/207th Brigade, Camp Sayer, Farah	95	95	0	One building is insulated with fire barrier coating throughout. The remainder are insulated with partial fire barrier coating in the open areas and the ceiling above the sandwich panel partition rooms. The insulation that is not coated with fire barrier are in the celings.
7	KAO	W5J9LE-11-C-0046 NA EEC International - Metag JV	ANA 1/205th Kandaks(East), Camp Hero	84	47	42	
8	Helmand	W5J9LE-12-C-0058 NA Metag Insaat Ticaret	ANA 215th Combat Logistics Brigade	26	0	0	Drawings (semi) complete D-B-B but DB by pk architects & engineers for ACI-SCC JV. Specifications by same. No specification for spray foam insultation. Project appears to be a resolicitation from the previous project W5J9LE-10-D-0017-0014.
9	KAO	W5J9LE-12-C-0003 NA Tectra Tech EC	ANA 1/4/205th @ Deh Rawood Camp Hadrian	17	17	0	DC-315 approved and has begun installation of coating.
10	KAO	W5J9LE-11-C-0049 NA Contract International	ANA 1/205th Kandaks(West), Camp Hero	26	19	19	
11	KAO	W5J9LE-12-C-0017 NA Contract International	ANA 2/205 RCC/MP/Trans & Thicken @ Qalat	85	0	0	Submitted and approved (foam and coating) .
			SUBTOTAL	**704**	**381**	**216**	

TAB A-2 (List of contracts that have been recently awarded)

No.	AO	CONTRACT NUMBER	PROJECT NAME	NO. ARCH SPAN BLDGS.	NO. BLDG. INSUL.	NO. BLDG. COATED	REMARKS (as of 1 March 2013)
1	Helmand	W5J9LE-12-0012 NA Mideast Construction	ANA 215th MI/MP/Courthouse	23	0	0	Contractor submitted twice, both submittals X-coded.
2	Helmand	W5J9LE-13-C-0004 NA Metag Insaat Ticaret	ANA 7CDO to SOK Conversion	7	0	0	Foam insulation not installed as of 8 JAN13.
3	KAO	W5J9LE-12-C-0007 NA Metag Insaat Ticaret	ANA 3/4/205th Brigade Garrison Phase 2	28	0	0	Foam insulation not installed as of 8 JAN13.
4	KAO	W5J9LE-12-C-0033 NA Metag Insaat Ticaret	ANA 3/205th Brigade @ Pasab	113	0	0	Foam insulation not installed as of 8 JAN13.
5	Herat	W5J9LE-12-C-0008 NA EEC International	ANA 3/207 Brigade Camp CED Badghis	96	0	0	Materials (foam and coating) approved and on site. Baymer SHPU-40-11(A)/Besmodur 44V20L(B) and FASF Elastopor H1611/17 both approved earlier but haulted from installation due to contracting serial letter. Resubmitted ICC-ESR products.
6	KAO	W5J9LE-13-C-4002 NA EEC International	ANA 3rd Air Squad Spec Mission Wing	5	0	0	Foam insulation not installed as of 8 JAN13.
7	Herat	W5J9LE-13-C-0006 NA Afghanistan Rehab & Architecture org Co.	ANA 214 utilities, Engineer, QRF Signal	18	0	0	Foam insulation not submitted as of 1MAR13.
8	Herat	W912DQ-13-C-4000 NA Tetra Tech EC	ANA AAF Shindand Air Wing PH IV	3	0	0	Foam insulation not submitted as of 1MAR13.
9	KAO	W5J9LE-13-C-0013 NA Land view Construction	ANA KAP Ph V	3	0	0	Foam insulation not submitted as of 1MAR13.
10	KAO	W5J9LE-13-C-0010 NA Lara International	ANA 3CDO to SOK Conversion	2	0	0	Foam insulation not submitted as of 1MAR13.
			SUBTOTAL	**298**	**0**	**0**	

TAB B - (Project Photos)

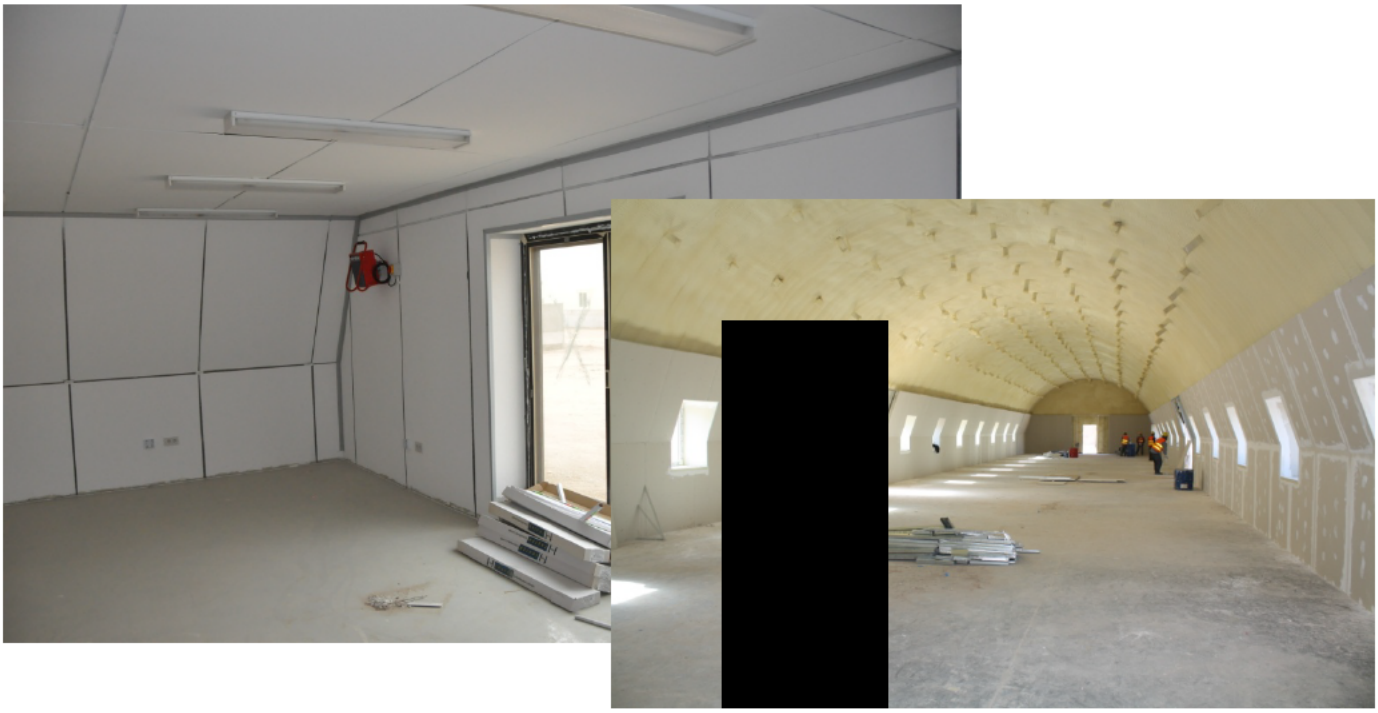

Figure B-1: Completed structures - Foam and thermal barrier system installed.

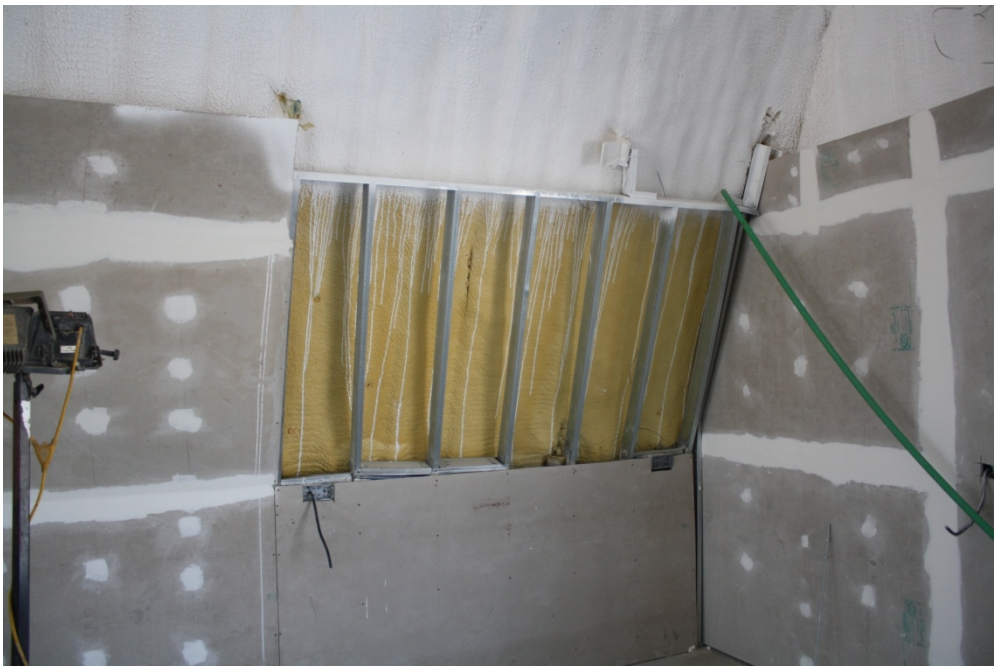

Figure B-3 – Structures under construction with foam /thermal barrier in various stages.

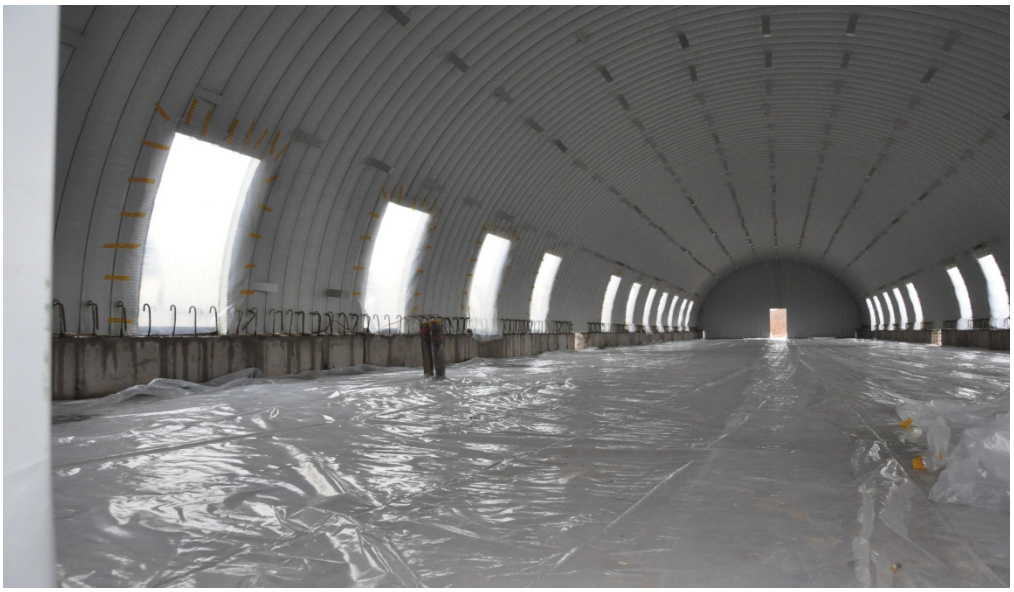

Figure B-4 – Structures for which no systems have been installed. These will be code compliant.