OIG
Office of Inspector General
U.S. Department of State • Broadcasting Board of Governors

MA-16-01 | Office of Audits | April 2016

Management Alert: Hazardous Electrical Current in Office and Residential Buildings Presents Life, Health, and Safety Risks at U.S. Embassy Kabul, Afghanistan

MANAGEMENT ALERT

Summary of Review

During the course of an ongoing audit of the Bureau of Overseas Buildings Operations (OBO) construction and commissioning of a new office and residential apartment building at the U.S. Embassy in Kabul, Afghanistan, the Office of Inspector General (OIG) and the U.S. Army Corps of Engineers (USACE) identified life, health, and safety risks to building occupants due to a type of hazardous electrical current—known as objectionable current—in both the office and apartment building. Specifically, OIG and the USACE team, which included master electricians from Task Force Protect Our Warfighters and Electrical Resources (POWER), discovered objectionable currents measuring up to 16.7 amps in the New Office Annex (NOX) building and up to 27 amps in the residential apartment building—Staff Diplomatic Apartment (SDA-1).[1] Objectionable current is electrical current occurring on the grounding wiring of a building. Although the National Electrical Code does not establish a life safety threshold for objectionable current, Task Force POWER considers any objectionable current a risk to life and safety. Industry safety standards regarding electrical shock indicate that loss of life is probable with current as low as 10 amps.[2] In the case of the NOX, the objectionable current measured 6 amps more than the level that the Centers for Disease Control and Prevention (CDC) have determined is likely to result in cardiac arrest, severe burns, and probable death. With respect to the residential apartment, or SDA-1, the objectionable current measured 17 amps more than the level of amperage that the CDC has determined is likely to result in death. The most common causes of objectionable current are improperly installed electrical wiring, equipment, and faulty electrical appliances.

The NOX is designed to accommodate more than 900 Department personnel, and when fully occupied, SDA-1 will house nearly 300 residents. When objectionable current flows on metal parts, it can cause electric shock and even death from ventricular fibrillation because of the elevated voltage. It can also cause a fire to ignite if combustible material is placed near the current. As a result, the life, health, and safety of Department personnel occupying these buildings are at risk. Accordingly, OIG is recommending that Embassy Kabul in coordination with OBO take immediate action to: (1) examine the installation of electrical wiring, equipment, and appliances in the NOX and SDA-1 to ascertain the cause for the objectionable current; (2) determine what mitigation measures can be immediately taken to eliminate or reduce risk to personnel occupying the buildings; (3) and, to the extent necessary, inform residents of the existence of objectionable current and the risks associated with it, and provide instructions on how to eliminate or avoid accompanying hazards.

Embassy Kabul and OBO provided comments on a draft of this report, which are reprinted in their entirety in Appendix A and Appendix B, respectively. Based on those comments, OIG considers Recommendation 1 resolved, pending further action, and Recommendations 2 and 3 unresolved.

[1] USACE is administering and overseeing the contract for Task Force POWER on behalf of the U.S. Forces Joint Engineering Directorate in Afghanistan.

[2] U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention, *Electrical Safety: Safety and Health for Electrical Trades–Student Manual*, DHHS (NIOSH) Publication No. 2002-123, January 2002.

BACKGROUND

In October 2015, OIG initiated an audit of the Bureau of Overseas Buildings Operations (OBO) construction and commissioning of a new office and residential apartment building at the U.S. Embassy in Kabul, Afghanistan. Specifically, the audit is evaluating the extent to which Department policies and procedures were followed during the construction and commissioning of the 917-desk New Office Annex (NOX) and the 298-bed Staff Diplomatic Apartment (SDA-1). The two buildings are part of a major office and residential expansion at Embassy Kabul scheduled to be completed in Fall 2017 at a cost of nearly $800 million. Embassy personnel began occupying the NOX in July 2015, and residents began moving into the SDA-1 apartments in February 2016.

Figure 1: Objectionable Current Reading Taken February 14, 2016 – New Office Annex (NOX) Basement Switchgear Room. (OIG photo)

As part of the planned audit work, OIG executed an interagency support agreement with the U.S. Army Corps of Engineers (USACE) to provide licensed, professional electricians and mechanical engineers to assist OIG auditors in evaluating whether the NOX and SDA-1 facilities, components, and systems were constructed in accordance with contract specifications and international building code standards. The USACE team included master electricians from Task Force Protect Our Warfighters and Electrical Resources (POWER). Task Force POWER in Afghanistan was created by Congress in response to the deaths of 14 U.S. personnel in Iraq in 2008 due to electrocution as well as injuries to a number of others from electrical shock. Its mission is to identify and correct electrical issues at all military facilities in Afghanistan. According to a 2009 report from the Department of Defense Office of the Inspector General, Task Force POWER was established to "prevent the loss of life and government property through immediate and long-term measures that will significantly reduce the number of electrical and fire incidents throughout the combined/joint operations area [Afghanistan]."[3] Since its creation, Task Force POWER has inspected 7,028 facilities, totaling more than 4.8 million square feet. It has identified and addressed 105,686 life, health, and safety issues and other electrical problems in Afghanistan.

[3] *Assessment of Electrical Safety in Afghanistan*, Inspector General, United States Department of Defense, Report No. SPO-2009-005, July 24, 2009.

RESULTS

Objectionable Current Identified in Residential and Office Buildings

Section 250.6 of the National Electrical Code states that to prevent a fire, electric shock, or improper operation of equipment, electrical systems and equipment must be installed in a manner that prevents "objectionable current" from flowing on metal parts. Objectionable current is electrical current occurring on the grounding wiring of a building. It is often caused by improperly installed electrical wiring, equipment, and faulty electrical appliances. Objectionable current can cause electrical shock, fires, interference with communications equipment, and damage to electrical appliances. It can also cause electromagnetic fields, which negatively affect the performance of electronic devices, including medical devices and security cameras. If left unaddressed, it can pose significant risks to the life, health, and safety of building occupants.

During the course of Task Force POWER's testing of ground wiring in the NOX and SDA 1, multiple sources of objectionable current were identified throughout. Specifically, testing revealed objectionable currents measuring up to 16.7 amperes (or amps) at the NOX and up to 27 amps at SDA 1.

Based on its inspection, Task Force POWER's initial observation is that improperly installed wiring is the likely cause of the objectionable current in both buildings. Task Force POWER tested a sample of electric panels in the NOX and SDA 1 and found evidence of an improper neutral and ground bond in at least one panel. Given the levels of objectionable current identified in both buildings, Task Force POWER believes that other improper connections—which electricians refer to as neutral-to-ground, or neutral-to-case bonds—exist but have yet to be located. In the course of its work throughout Afghanistan, Task Force POWER found that improper grounding and bonding are major contributors to electrical accidents. Task Force POWER also performed tests in which it shut down major equipment and found that the shutdown did not result in any drop in objectionable current, which further indicates that the likely cause of the objectionable current is faulty wiring.

According to the Centers for Disease Control and Prevention (CDC), cardiac arrest and severe burns can occur if a human body is exposed to electrical currents greater than 10 amps.[4] Task Force POWER further states that in order to comply with the National Electrical Code, objectionable current should not flow on grounding paths. Table 1 shows the reaction of the human body when exposed to differing levels of electrical currents.

[4] Industry standards regarding electrical shock indicates that loss of life is probable with current as low as 10 amps. See U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health (NIOSH), Centers for Disease Control and Prevention, *Electrical Safety: Safety and Health for Electrical Trades-Student Manual*, DHHS (NIOSH) Publication No. 2002-123, January 2002.

Table 1: Effects of Electrical Current on the Body

Current[a] (milliamp)	Current (amp)[b]	Reaction[c]
<5 milliamps	<0.005 amps	Reaction can range from a faint tingle to a slight shock. Strong involuntary movements caused by the shock can cause injuries.
50 to 150 milliamps	0.050 to 0.150 amps	An extremely painful shock accompanied by possible respiratory arrest; severe muscle contractions can occur. At this range, death is possible.
1,000 to 4,300 milliamps	1.0 to 4.3 amps	Ventricular fibrillation (irregular heart pumping), muscle contraction, and nerve damage occur. At this range, death is likely.
>10,000 milliamps	>10.0 amps	Cardiac arrest occurs along with severe burns. At this level, death is probable.
16,700 milliamps	**16.7 amps**	**Objectionable current readings at the NOX reached this level.**
27,000 milliamps	**27.0 amps**	**Objectionable current readings at SDA 1 reached this level.**

[a] Current refers to the amount of electricity flowing per second, and it is measured in milliamperes or amperes. Effects listed are for voltages less than about 600 volts. Higher voltages of electricity also cause severe burns.
[b] 1000 milliamperes (milliamps) equals 1 ampere (amp).
[c] The amount of electrical current that flows through the body determines various effects of an electric shock. The severity of the body's reaction to the electrical current can vary based upon gender and differences in muscle and fat content.
Source: U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health (NIOSH), *Electrical Safety: Safety and Health for Electrical Trades-Student Manual*, DHHS (NIOSH) Publication No. 2002-123, January 2002.

In response to Task Force POWER's findings and the ongoing OIG audit, embassy facilities personnel also conducted an inspection on February 29, 2016, and found objectionable currents ranging from 0.4 to 29.9 amps in the switchgear that services other embassy residential and office buildings. Moreover, OBO had issued a maintenance alert on May 21, 2015, that warned of objectionable currents at embassies and posts worldwide.[5] The alert stated that based on electrical system grounding investigations at seven posts, there may be a potential hazard present on electrical grounding systems at U.S. diplomatic facilities overseas, including a "touch hazard" and a "shock hazard." The alert went on to ask that embassy officials "advise facility staff, contractors, security, and anyone with access to the electrical systems that this hazard may exist."[6] OBO's Electrical Safety Working Group is considering developing guidance that indicates that 3 amps of objectionable current is actionable and that over 20 amps of objectionable current will be considered a priority for the International Maintenance Assistance Program's Grounding Team. However, because objectionable current is a known risk, OIG believes it is imperative that Embassy Kabul and OBO take immediate actions to address the hazards caused by objectionable current.

[5] In May 2015, OBO's Office of Facilities Management issued a *Maintenance Alert: Electrical System Grounding.*

[6] OIG will continue to examine the embassy's actions taken in response to the 2015 maintenance alert in its ongoing audit.

CONCLUSION

Task Force POWER's inspection of the NOX and SDA-1 at Embassy Kabul found objectionable current at levels that can cause severe injury and death to embassy personnel, as well as damage to property and equipment. OIG and Task Force POWER representatives briefed senior embassy officials of their findings on February 27, 2016. Subsequent to that briefing, the Department sent a cable (see Appendix C) on February 29, 2016, stating, among other things, that little or no objectionable current was measured prior to occupancy but that it is taking actions to address the high levels of objectionable current that have now been detected. The Department also issued a Management Notice on March 2, 2016, further outlining the actions it is planning to take to address the issue (see Appendix D). OIG is equally concerned with the safety and security of personnel living and working at the embassy and believes that it is paramount that the embassy takes actions to address the concerns. Accordingly, OIG is making the following recommendations:

Recommendation 1: OIG recommends that the Bureau of Overseas Buildings Operations' Facilities Management Office, in coordination with Embassy Kabul, take immediate action to: (1) examine the installation of electrical wiring, equipment, and appliances in the New Office Annex and Staff Diplomatic Apartment-1: (2) determine the cause for the objectionable current, and (3) correct the deficiencies.

OBO Response: OBO concurred with the recommendation and stated that it has already taken steps to remediate the objectionable current levels in the NOX and SDA-1, including the following:

- OBO has formed a team with personnel from the embassy in Kabul including Facility Management staff, Construction Management staff, and support contractors to assess and evaluate the causes of objectionable current in both buildings. According to OBO, the team has already reduced levels of objectionable current.
- OBO deployed a specialized grounding team to Kabul to evaluate and remediate objectionable current further. This team arrived at U.S. Embassy Kabul on March 20, 2016.
- OBO indicated that it will contract with a third party to conduct an independent review of both buildings.

Embassy Kabul Response: Embassy Kabul reported that Facilities Management, OBO, and maintenance and construction contractors have examined the electrical wiring in the NOX and SDA-1 and have documented the objectionable current readings at the buildings' electrical panels. The group also examined the main power distribution loop servicing both the East and West sides of the embassy compound and subsequently shared this information with OBO's Electrical Safety Working Group.

Embassy Kabul further stated that although the group consisting of Facilities Management, OBO, and contractors performed detailed inspections of the buildings and the power distribution loop, it has not been able to determine a single root cause of the objectionable current. Due to the highly technical nature of objectionable current, the embassy indicated that it must defer to the OBO subject matter experts as well as OBO's Electrical Safety Working Group for guidance and a determination of the causes of objectionable current at the SDA-1 and NOX buildings.

Embassy Kabul reported that a grounding team deployed by OBO's International Maintenance Assistance Program arrived at post on March 20, 2016, and is currently working to identify and correct the sources of objectionable current. A formal report will be completed by the team when mitigation has been completed.

OIG Reply: Based on the planned corrective actions on the part of both OBO and Embassy Kabul, OIG considers this recommendation resolved, pending further action. This recommendation will be closed when OIG receives and accepts documentation from OBO and Embassy Kabul demonstrating that electrical wiring, equipment, and appliances in the NOX and SDA-1 have been examined and that the sources of objectionable current have been identified and mitigated.

Recommendation 2: OIG recommends that the Bureau of Overseas Buildings Operations' Facilities Management Office, in coordination with Embassy Kabul, determine what mitigation measures can be immediately taken to eliminate or reduce risk to personnel occupying the buildings.

OBO Response: OBO did not concur that observed objectionable current poses a general problem for the occupants of the building. OBO stated that the first priority of both OBO and Embassy Kabul was to inspect residential spaces and those used by the public. According to OBO, the readings in residential and public spaces were consistent with readings taken prior to building occupancy, and OBO verified that the objectionable current was limited to locked and restricted mechanical and electrical rooms. OBO agreed, however, that workers in the restricted electrical and mechanical rooms face a potential hazard.

OBO also stated that additional signage was posted in the restricted mechanical and electrical rooms experiencing higher levels of objectionable current, recommending all workers in these spaces utilize appropriate electrical safety equipment. In addition, Embassy Kabul communicated the situation to all staff, alerting them of objectionable current and advising them to stay out of restricted areas.

Embassy Kabul Response: Embassy Kabul indicated that it will defer to OBO's Electrical Safety Working Group for guidance related to planned mitigation measures and the safety of building occupants. On March 2, 2016, the embassy issued a Management Notice to alert all mission personnel to the issue of objectionable current and to inform

them of OBO's plans to have the buildings inspected by a grounding team from OBO's International Maintenance Assistance Program accompanied by an independent third party contractor. According to the embassy, the OBO grounding team arrived in Kabul on March 20, 2016, and is currently in the process of identifying and correcting the sources of objectionable current.

OIG Reply: OIG considers this recommendation unresolved because OBO did not concur that the observed objectionable current poses a risk for occupants in the NOX and SDA-1. According to Task Force POWER, until OBO is able to isolate the source(s) of objectionable current, it may be present anywhere throughout the electrical system. Higher readings of amperage detected in mechanical and electrical rooms may be the cumulative result of multiple sources of objectionable current located throughout the building. Additionally, according to Task Force POWER, higher levels of objectionable current will be observed at the electrical panels, as this is where all electricity returns to complete the circuit. While authorized personnel performing maintenance on the electrical system are at a higher risk of coming in contact with objectionable current, there is no evidence that the risk is limited only to workers in restricted electrical and mechanical rooms.

This recommendation will be considered resolved when OBO and Embassy Kabul identify mitigation measures to eliminate or reduce the immediate risk to those personnel occupying the NOX and SDA-1. The March 2, 2016 Management Notice issued to all Embassy personnel increased awareness, but did not identify mitigation measures for all Embassy personnel. Instead, the notice limits its guidance to advising employees not to enter or tamper with locked mechanical rooms or electrical boxes. This recommendation will be considered closed when OIG receives and accepts documentation demonstrating that OBO, in conjunction with U.S. Embassy Kabul, has implemented mitigation measures to eliminate or reduce the immediate risk to office workers and building residents in addition to those mitigation steps already taken to reduce the risk to workers accessing mechanical and electrical rooms.

Recommendation 3: OIG recommends that Embassy Kabul, to the extent necessary, inform residents of the existence of objectionable current and the risks associated with it, and provide instructions on how to eliminate or avoid accompanying hazards.

Embassy Kabul Response: Embassy Kabul reported that the Management Notice issued to all mission personnel on March 2, 2016, served to inform the residents of the SDA and NOX buildings and all other mission personnel of the presence of objectionable current. The Management Notice specifically stated that "all non-Facilities employees are asked not to attempt to enter or tamper with any buildings' locked mechanical rooms or buildings' electrical boxes." According to the embassy, this recommendation was based on OBO guidance that following this instruction would prevent building occupants from coming into contact with dangerous objectionable current. The Management Notice also stated: "In certain extreme cases, [objectionable current] can be a life safety issue." The

last line of the Notice is bolded and states: "Any employee who has safety concerns about objectionable current…is encouraged to contact Paul Schafer, Facilities Manager."

OBO Response: OBO concurred with this recommendation and indicated that it has posted signage in areas exhibiting higher levels of ground current, the electrical and mechanical rooms, and has instructed all workers in these spaces to utilize appropriate electrical safety equipment until the grounding issues are fully addressed. Further, electrical panel boards in these buildings are labeled with Arc Flash warnings. OBO further indicated that the Kabul Embassy Management Notice described above was issued to embassy staff on March 2, 2016.

OIG Reply: Based on the responses from OBO and Embassy Kabul, OIG considers this recommendation unresolved. The Management Notice issued to mission personnel on March 2, 2016, did not provide all necessary information. In the Notice, the Department stated that it "did not concur that the levels of objectionable current are unsafe for building residents and office occupants." However, OIG and Task Force Power continue to assert that objectionable current may pose a potential threat to all building occupants, including office workers in the NOX and residents of SDA-1. Because objectionable current may be present anywhere throughout the electrical system, OBO cannot be certain the risk is limited only to those personnel accessing electrical and mechanical rooms. As a result, this recommendation will be considered resolved when Embassy Kabul develops an action plan for informing building occupants of the potential threat presented by objectionable current and providing instructions on how to eliminate or avoid accompanying hazards. This recommendation will be closed when OIG receives and accepts documentation demonstrating that Embassy Kabul has informed office workers in the NOX and the residents of SDA-1 that, until the source(s) of objectionable current are identified and remediated, it may pose a potential safety risk to all building occupants.

APPENDIX A: BUREAU OF OVERSEAS BUILDINGS OPERATIONS COMMENTS

United States Department of State

Washington, D.C. 20520

MAR 17 2016

~~SENSITIVE BUT UNCLASSIFIED MEMORANDUM~~
(~~UNCLASSIFIED~~ when separated from attachment)

TO: OIG – Inspector General Steve Linick

FROM: OBO – Director Lydia Muniz

SUBJECT: OBO Response to Draft OIG Management Alert, March 2016

Attached is OBO's response to the Draft OIG Management Alert, *Hazardous Electrical Current in Office and Residential Buildings Presents Life, Health, and Safety Risks at U.S. Embassy Kabul, Afghanistan*, received March 9, 2016.

Attachment:
As stated.

~~SENSITIVE BUT UNCLASSIFIED~~

~~SENSITIVE BUT UNCLASSIFIED~~

Office of Inspector General (OIG)
Inspection of Embassy Kabul, Afghanistan
OIG Management Alert, March 2016

The Department's Bureau of Overseas Buildings Operations (OBO) is in receipt of the recent OIG management alert MA-16-01 based on the U.S. Army Corps of Engineers (USACE) report dated 26 February, 2016: *Task Force Power: U.S. Embassy – Kabul, Afghanistan.*

Objectionable Current and OBO's Worldwide Efforts: Objectionable current is electrical current occurring on the grounding wiring of a building. This issue occurs worldwide in both new and existing commercial and residential buildings, and is not limited to State Department projects. The most frequent causes of objectionable current are improperly installed electrical wiring, equipment, and faulty electrical appliances.

The most common effects of excessive objectionable current are interference with communications equipment and damage to electrical appliances. In certain extreme cases, objectionable current may be a life-safety issue. The National Electrical Code does not establish a life-safety threshold for objectionable current; however, OBO is developing worldwide guidance concerning actionable levels of objectionable current.

In 2014, OBO established a specialized grounding team, which began a worldwide survey of overseas posts to identify and mitigate objectionable current. In 2015, OBO sent a Maintenance Alert to all posts making them aware of the potential hazard and how to protect exposed personnel. In addition, OBO instructed Facility Managers to measure for objectionable current and formed the OBO Electrical Safety Working Group (ESWG) to mitigate the risk of objectionable current on newly constructed and existing facilities. In January 2016, OBO once again instructed Facility Managers to measure for objectionable current and reissued the original Maintenance Alert.

OBO is drafting a new Construction Alert instructing OBO Project Directors and Construction Managers to have contractors measure for objectionable current with as much load on the building as possible prior to occupancy, and to correct any significant levels before the building is occupied. These measurements will be used for comparisons in follow-up tests conducted after the building is fully occupied and operating at full capacity.

~~SENSITIVE BUT UNCLASSIFIED~~

Further, OBO is modifying language in ongoing and future major construction contracts requiring measurements of objectionable current at specific intervals following full occupancy.

Objectionable Current and OBO's Mitigation Efforts at U.S. Embassy Kabul, Afghanistan: OBO conducted comprehensive reviews of SDA-1 and the New Office Annex (NOX) buildings prior to occupancy. At that time, little or no objectionable current was measured. However, it is not unusual for objectionable current to present itself after the installation of equipment and appliances post-occupancy and when the building is running at full capacity.

Findings of objectionable current have been limited to secure mechanical and electrical rooms of SDA-1 and the NOX. These rooms are off limits to personnel except for trained facility specialists. Measurements in residential and public areas have been found to be typically below 1 amp, and frequently 0.0 amps. Additionally, SDA-1 and the NOX have Ground Fault Circuit Interrupter protection to safeguard against electrical safety risk (an interrupter is a circuit breaking device that acts to prevent electric shock in as little as $1/40^{th}$ of a second when it detects current flowing along an unintended path). These systems were all tested prior to occupancy and found to be operating correctly.

Once OBO was notified of elevated levels of objectionable current in restricted mechanical and electrical rooms, it took the following actions to identify and remediate potential causes:

- OBO and Post formed a team, including Facility Management staff, Construction Management staff, and support contractors, to conduct a thorough re-audit of SDA-1 and the NOX. OBO is evaluating the causes and has already reduced levels of objectionable current.

- Additional signage was posted in the restricted mechanical and electrical rooms experiencing higher levels of objectionable current, recommending all workers in these spaces utilize appropriate electrical safety equipment.

- All staff was alerted of objectionable current and advised to stay out of restricted areas.

- OBO is deploying a specialized grounding team to Kabul to evaluate and remediate objectionable current further. This team will arrive on or about March 21.

- OBO will contract with an independent third party to conduct an independent review of both buildings.

- OBO will issue a Construction Alert to staff at all active construction projects worldwide to measure and document baseline objectionable current levels and remediate, if necessary.

OBO requests that the OIG revise its draft Management Alert to make clear that the objectionable current is limited to certain restricted, controlled areas, such as mechanical and electrical rooms.

Recommendations:

~~(SBU)~~ Recommendation 1: OIG recommends that Embassy Kabul, in coordination with the Bureau of Overseas Buildings Operations' Facilities Management Office, take immediate action to: (1) examine the installation of electrical wiring, equipment and appliances in the New Office Annex and Staff Diplomatic Apartment-1, (2) determine the cause for the objectionable current, and (3) correct the deficiencies. (Action: Embassy Kabul, in coordination with OBO)

~~(SBU)~~ OBO Response, March 2016: OBO agrees that objectionable current should be identified, examined, and mitigated, and has already taken steps to do so.

OBO is taking the following additional actions to remediate the objectionable current levels in SDA-1 and the NOX immediately:

- OBO and Post formed a team, including Facility Management staff, Construction Management staff, and support contractors, to re-audit SDA-1 and the NOX. OBO is evaluating the causes and has already reduced levels of objectionable current.

- OBO is deploying a specialized grounding team to Kabul to evaluate and remediate objectionable current further. This team will arrive on or about March 21.

- OBO will contract with an independent third party to conduct an independent review of both buildings.

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~~(SBU)~~ **Recommendation 2:** OIG recommends that Embassy Kabul, in coordination with the Bureau of Overseas Buildings Operations, Facilities Management Office, determine what mitigation measures can be immediately taken to eliminate or reduce risk to personnel occupying the buildings. (Action: Embassy Kabul, in coordination with OBO)

~~(SBU)~~ **OBO Response, March 2016:** OBO does not agree that the observed objectionable current poses a general problem for the occupants of the building, but agrees that workers in the restricted electrical and mechanical rooms face a potential hazard.

OBO's and Post's first priority was to inspect residential spaces and those used by the public. The readings in residential and public spaces were consistent with readings taken prior to building occupancy and verified that the objectionable current was limited to locked and restricted mechanical and electrical rooms.

Additional signage was posted in the restricted mechanical and electrical rooms experiencing higher levels of objectionable current, recommending all workers in these spaces utilize appropriate electrical safety equipment.

In addition, Post communicated the situation to all staff, alerting them of objectionable current and advising them to stay out of restricted areas.

~~(SBU)~~ **Recommendation 3:** OIG recommends that Embassy Kabul, to the extent necessary, inform residents of the existence of objectionable current and the risks associated with it and provide instructions on how to eliminate or avoid accompanying hazards. (Action: Embassy Kabul, in coordination with OBO)

~~(SBU)~~ **OBO Response, March 2016:** OBO agrees and has posted signage as described below.

OBO has posted additional signage in areas exhibiting higher levels of ground current, the electrical and mechanical rooms, and has instructed all workers in these spaces to utilize appropriate electrical safety equipment until the grounding issues are fully addressed. Further, electrical panelboards in these buildings are labeled with Arc Flash warnings.

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A Kabul Embassy Management Notice was issued to embassy staff on March 2, 2016, alerting staff of the objectionable current and reminding them to stay out of restricted areas, such as mechanical and electrical rooms.

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APPENDIX B: U.S. EMBASSY KABUL COMMENTS

Embassy of the United States of America
Kabul, Afghanistan

UNCLASSIFIED

March 23, 2016

TO: Tinh Nguyen, Deputy Assistant Inspector General for Middle East Region Operations (MERO)

FROM: Ambassador P. Michael McKinley

SUBJECT: Comments on Draft Report *Management Alert: Hazardous Electrical Current in Office and Residential Buildings Presents Life, Health, and Safety Risks at U. S. Embassy Kabul, Afghanistan (MA-16-01)*

Embassy Kabul appreciates the opportunity to comment on the report *Management Alert: Hazardous Electrical Current in Office and Residential Buildings Presents Life, Health, and Safety Risks at U. S. Embassy Kabul, Afghanistan (MA-16-01)*. The report contains findings and recommendations that are technical in nature related to our buildings and infrastructure. For this reason, the Overseas Buildings Operations (OBO) office has sent OIG its own response to MA-16-01, and Embassy Kabul defers to OBO on all points contained in its response.

Please find Post's response to each individual OIG recommendation below:

Recommendation 1: OIG recommends that Embassy Kabul, in coordination with the Bureau of Overseas Buildings Operations' Facilities Management Office, take immediate action to: (1) examine the installation of electrical wiring, equipment and appliances in the New Office Annex and Staff Diplomatic Apartment-1, (2) determine the cause for the objectionable current, and (3) correct the deficiencies.

(1) Embassy Kabul Facilities Management, OBO/CM, Pacific Architects and Engineers operations staff, and construction contractors from Caddell have

examined the electrical wiring in the SDA-1 and NOX buildings and have documented the objectionable current readings at the buildings' electrical panels. The group examined the main power distribution loop servicing both the East and West compounds, and subsequently shared this information with the OBO Electrical Safety Working Group (ESWG).

(2) Although the Embassy Kabul team has performed detailed inspections of the buildings and power loop, it has not been able to determine a single root cause of the objectionable current. Due to the highly technical nature of objectionable current, Post must defer to the OBO subject matter experts and OBO ESWG for guidance and a determination of the causes of objectionable current at the SDA-1 and NOX buildings.

(3) An OBO grounding team arrived at Post March 20 and is currently working to identify and correct sources of objectionable current. A formal report will be completed by the team once mitigation has been completed.

Recommendation 2: OIG recommends that Embassy Kabul, in coordination with the Bureau of Overseas Buildings Operations and Facilities Management Office, determine what mitigation measures can be immediately taken to eliminate or reduce risk to personnel occupying the buildings.

Embassy Kabul defers to the OBO ESWG experts for guidance related to mitigation measures and the safety of building occupants. On March 2, Embassy Kabul issued Management Notice 16-066 entitled "Objectionable Current Information" to alert all Mission personnel to the issues of objectionable current and inform them of OBO plans to have the buildings inspected by a professional OBO grounding team accompanied by an independent third party contractor. OBO provided language for this notice and cleared on it prior to distribution. The OBO grounding team arrived in Kabul on March 20 and is identifying and correcting sources of objectionable current.

Recommendation 3: OIG recommends that Embassy Kabul, to the extent necessary, inform residents of the existence of objectionable current and the risks

associated with it and provide instructions on how to eliminate or avoid accompanying hazards.

Management Notice 16-066, "Objectionable Current Information," served to inform the residents of the SDA and NOX buildings and all other Mission personnel of the presence of objectionable current. The Management Notice specifically stated that "all non-Facilities employees are asked not to attempt to enter or tamper with any buildings' locked mechanical rooms or buildings' electrical boxes." This recommendation is based on OBO guidance that following this instruction would prevent building occupants from coming into contact with dangerous objectionable current.

Approved: AMB – P. Michael McKinley

Drafted: MGT – Paul Schaefer, x[redacted] cell: [Redacted] (b) (6) (March 22, 2016)

Cleared: MGT – Francoise Blais (OK)
MGT – Karen Davidson (OK)
A/DCM – Michael Raynor (OK)

APPENDIX C: DEPARTMENT OF STATE CABLE ADDRESSING OIG AND USACE CONCERNS ABOUT OBJECTIONABLE CURRENT

UNCLASSIFIED

Action Office: RSO, MGT, FMM
Info Office: GSO_INFO, MGT_INFO, EXEC_INFO, GSO_LES_HOUSING_INFO, RSO_INFO, DETCMDR_INFO

MRN:	16 STATE 20796
Date/DTG:	Feb 29, 2016 / 292000Z FEB 16
From:	SECSTATE WASHDC
Action:	KABUL, AMEMBASSY *ROUTINE*
E.O.:	13526
TAGS:	ABLD, AMGT, ASEC
Subject:	Kabul NOX and SDA-1: Objectionable Current

1. The Department's Bureau of Overseas Buildings Operations (OBO) is in receipt of the U.S. Army Corps of Engineers (USACE) report dated 26 February, 2016, subject: Task Force Power: U.S. Embassy – Kabul, Afghanistan.

2. OBO does not concur with the USACE recommendations that Staff and Dependent Apartment Building 1 (SDA-1) and the New Office Annex (NOX) need to be evacuated. OBO's decision was made after consulting with OBO Facilities Management (FAC), Construction Management (CM), Design and Engineering (DE), Safety Health and Environmental Management (SHEM), and the OBO Electrical Safety Working Group (ESWG).

3. Objectionable current is electrical current occurring on the grounding wiring of a building. This issue occurs worldwide in both new and existing commercial and residential buildings, and is not limited to State Department projects. The most common causes of objectionable current are improperly installed electrical wiring, equipment, and faulty electrical appliances. The most common effects of excessive objectionable current are interference with communications equipment and damage to electrical appliances. In certain extreme cases, objectionable current may be a life safety issue. The National Electrical Code does not establish a life safety threshold for objectionable current; the OBO Electrical Safety Working Group is currently drafting worldwide guidance concerning actionable levels of objectionable current.

4. Background: CM and FAC conducted comprehensive reviews of SDA-1 and the NOX buildings prior to occupancy. At that time, the team measured little or no objectionable current. It is not unusual for objectionable current to present itself after the installation of equipment and appliances post-occupancy.

5. As soon as OBO learned of reports of actionable objectionable current in restricted mechanical and electrical rooms, OBO instructed a team – including FAC, CM, and support contractors – to re-audit SDA-1 and the NOX. This audit began 25 February. In addition, OBO is dispatching an IMAP grounding team, as well as a third-party contractor, to conduct comprehensive independent reviews. In the interim, OBO will post additional signage in areas experiencing higher levels of objectionable current and recommends that all workers in these spaces utilize appropriate electrical safety equipment until the grounding issues are fully addressed.

6. To perform a comprehensive review of electrical grounding in SDA-1 and the NOX, OBO will inspect all/all spaces including all equipment and all appliances installed post-occupancy.

7. OBO is committed to providing safe, secure, and fully functional permanent facilities to support Embassy Kabul's mission and will continue to rigorously eliminate all electrical safety risks on the compound.

8. Post's OBO point of contact is Branch Chief Christopher Dudding (OBO/CFSM/CM/CO/NEA/SCA), who can be reached via telephone 703-875-[Redacted] (b) (6) or via email [redacted]@state.gov.

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APPENDIX D: DEPARTMENT MANAGEMENT NOTICE OUTLINING ACTIONS TO ADDRESS CONCERNS WITH OBJECTIONABLE CURRENT

MANAGEMENT NOTICE 16-066

Date: 2016-03-02

Subject: Objectionable Current Information

To: All American Personnel

Cleared By: James Martin on 2016-03-02

Approved By: James Martin on 2016-03-02

Objectionable current is electrical current occurring on the grounding wiring of a building. This issue occurs in both new and existing commercial and residential buildings worldwide, including in the United States. The most common effects of excessive objectionable current are potential interference with communications equipment and damage to electrical appliances. In certain extreme cases, it can be a life safety issue.

Since 2013, the Department has been tracking objectionable current in State Department buildings worldwide. In May 2015, OBO asked all posts to measure levels of objectionable current and report these findings to Washington. Embassy Kabul complied and found objectionable current throughout our compound which was reported to Washington in July 2015. OBO amassed data from all posts and tasked the OBO Electrical Safety Working Group (ESWG) to dispatch a special team from the International Maintenance Assistance Program (IMAP) to visit posts worldwide on a prioritized basis to mitigate these deficiencies. This team has not yet visited Kabul, as it has been dispatched to date to other posts deemed by OBO to pose more serious objectionable current concerns.

Recently, Kabul OIG brought in the U.S. Army Corps of Engineers (USACE) to specifically look at objectionable current in our NOX and SDA-1 buildings. USACE has issued a report expressing safety concerns about the levels of objectionable current for these two buildings. OBO has reviewed the USACE report and does not concur that the levels of objectionable current are unsafe for residents and office occupants. Prior to building occupancy, OBO teams had conducted comprehensive reviews of SDA-1 and the NOX buildings and found little or no objectionable current. Although USACE findings are now higher than the original readings, OBO notes that it is not unusual for objectionable current to present itself after the installation of equipment and appliances post-occupancy.

To address both the concerns raised in the USACE report and the original July 2015 compound report, OBO has:

1) Instructed a team to re-audit the compound and review the most recent objectionable current findings. This re-audit has been underway since February 25.
2) Agreed to immediately dispatch an IMAP team, as well as an independent third-party contractor, to Kabul once visas are granted, to further reduce levels of objectionable current throughout our compound. The IMAP team is being redeployed from another

post that had been deemed by OBO to have more serious objectionable current concerns than Kabul's, and OBO made this decision out of an abundance of caution and in order to clarify and address the USACE report as quickly as possible.

3) Arranged for additional signage in mechanical areas/electrical closets and reminded the authorized maintenance workers in these spaces to utilize appropriate electrical safety equipment until the grounding issues are fully addressed.

All non-Facilities employees are asked not to attempt to enter or tamper with any building's locked mechanical rooms or building electrical boxes.

Any employee who has safety concerns about objectionable current in the NOX, SDA-1, or elsewhere on our facilities is encouraged to contact Paul Schaefer, Facilities Manager.

Management Moves Diplomacy

Our Strength is Our People, Our Mission is You!

OIG AUDIT TEAM MEMBERS

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