DEFENSE CONTRACT MANAGEMENT AGENCY
DEFENSE CONTRACT MANAGEMENT AGENCY INTERNATIONAL
6359 Walker Lane, Suite 220
Alexandria, Virginia 22310-3259

Enclosure

CAR # HQ-08-LOGCAP-001 LIII

Deficient Quality System - Level III Corrective Action Request

Note: This enclosure contains data that is copied from documents marked Kellogg, Brown, & Root Proprietary Data. The data marked proprietary may be withheld because disclosure would cause a foreseeable harm to an interest protected by one or more exemptions of the Freedom of Information Act, 5 USC Section 552. KBR's proprietary data statement requests that any Government entity receiving the proprietary data act in accordance with DoD 5400.7-R, and consider the proprietary information as being for official use only (FOUO) so as to prevent unauthorized disclosure.

1. **References:**
    a. DAAA09-02-D-0007, Logistics Civil Augmentation Program (LOGCAP) (hereafter referred to as the LOGCAP Contract)
    b. DAAA09-02-D-0007 Task Orders
    c. DAAA09-02-D-0007 Section E-4: 52.246-5 Inspection of Services – Cost Reimbursement Apr/84
    d. FAR 52.246-5 Inspection of Services—Cost-Reimbursement
    e. LOGCAP Contract Statement of Work (SOW) (Attachment 001 to DAAA09-02-D-0007)
    f. KBR LOGCAP Quality Plan, Revision 5, DAAA09-02-D-0007 dated 3 Dec 2007 (marked proprietary)

2. **Summary of Findings:**

    a. This enclosure documents two overarching findings of nonconformance:

        i. **Grounding and Bonding:** KBR's quality system failed to properly identify and systemically correct facility grounding and bonding deficiencies in the performance of the LOGCAP contract IAW Paragraph 1.4 of the LOGCAP SOW, Army Regulation 420-1, the National Electric Code, and Task Order 139 paragraph 8.2.1. This failure led to potentially hazardous, life threatening conditions related to electrical bonding and grounding.

        ii. **Quali ty System:** KBR's Inspection/Quality Control System failed to properly identify and systemically correct numerous Program-wide deficiencies in the implementation, administration, and execution of the LOGCAP contract quality requirements of FAR 52.246-5 LOGCAP SOW paragraphs 1.14 and 8.0, and the Government accepted KBR Quality Control Plan (QCP) Rev 5, dated 3 Dec 2007.

    b. This is the second documented Government assessment of KBR's Quality system failures. In Dec 2006, DCMA Afghanistan issued a Level III CAR citing KBR Quality System failures (CAR LOGCAP-Afghan 06-03 Level III (Attachment 1)). The current quality system breakdowns have replicated the failure to provide conforming services and cost increases to the Government. Repeat findings from CAR LOGCAP-Afgan 06-03 Level III include:

        i. KBR Quality Department failed to implement and maintain the KBR Quality Plan as negotiated with and approved by the Government.
        ii. Failure of KBR employees at every level to have an understanding of their respective responsibilities.
        iii. KBR internal SOPs are not reviewed and revised to meet contract requirements.
        iv. KBR Quality Department is not performing monthly trend analysis utilizing a six month array of historical data to determine Risk Levels.

SPECIFIC FINDING #1- GROUNDING and BONDING

KBR's inspection/quality control system failed to properly identify and systemically correct facility grounding and bonding deficiencies in the performance of the LOGCAP contract IAW paragraph 1.4 of the LOGCAP SOW, Army Regulation 420-1, the National Electric Code (NEC), and the Task Order 139 SOW, paragraph 8.2.1. This failure has led to potentially hazardous and life-threatening conditions related to electrical bonding and grounding throughout the AOR.

Introduction: The LOGCAP contract and Iraq task orders contain requirements that establish standards for electrical repair, maintenance, grounding, bonding, and construction that include electrical wiring and distribution to and within a facility. The standards for electrical repair, maintenance, grounding and bonding are found in the Army Regulations identified below. Standards for construction have also been outlined in explicit task order requirements since Task Order 89 was awarded in 2005.

Both the base contract SOW and all of the Iraq Task Order SOWs, beginning with Task Order 59 awarded in 2003, require performance IAW Army regulations/regulatory guidance. Task orders since TO 89, awarded in 2005, also include a requirement that the contractor maintain a library of the regulations/regulatory guidance to ensure the proper standards of performance are readily available to the contractor. KBR was aware of these requirements yet failed to perform to the requirements outlined in the Army regulations and its quality system failed to detect the systemic breakdowns in performance.

During inspections documented below, the Government found systemic KBR failures to properly ground and bond facilities – failures that contributed to theater personnel receiving shocks in KBR maintained facilities on average once every three days since data was available in Sept 2006. The condition of these facilities created Life, Health, Safety (LHS) conditions for the occupants. The lack of grounding and bonding, among other electrical deficiencies, were recently identified and confirmed by three separate independent inspection teams from the U.S. Army Corps of Engineers (USACE), U.S. Army Combat Safety Center, and the Multi-National Force - Iraq (MNF-I) Task Force SAFE (Safe Action for Fire and Electricity).

The following paragraphs (1) trace contract requirements and standards for electrical repair, maintenance, grounding, bonding and construction and (2) demonstrate how KBR's quality system failed to properly identify and systemically correct facility grounding and bonding deficiencies in the performance of the LOGCAP contract (IAW paragraph 1.4 of the LOGCAP SOW, Army Regulation 420-1, the NEC, and Task Order 139 SOW, paragraph 8.2.1.) This failure led to hazardous life threatening conditions related to electrical bonding and grounding and is also a documented failure of KBR's quality system.

1. **REQUIREMENT(S) – GROUNDING & BONDING:** KBR's Quality System failed to detect and correct grounding and bonding deficiencies in accordance with the following contract requirements:

    a. **Performance Required IAW Applicable Army Regulations:** Both the LOGCAP Base Contract SOW and the Iraq Task Order SOW have required performance IAW Army Regulations as outlined below (emphasis added as indicated):

        i. Contract DAAA09-02-D-0007 Attachment 001 Logistics Civil Augmentation Program (LOGCAP) Support Contract SOW, paragraph 1.4 Performance Standards: "The Contractor will develop and provide the following material and services in accordance with this SOW. Unless indicated otherwise, <u>performance standards will be in accordance with Army regulatory guidance</u>."

ii. Contract DAAA09-02-D-0007 Task Order 59 SOW - V CORPS LOGCAP SUPPORT, dated 20 Jun 2003 and subsequent changes, Paragraph 1.1: "General. Notwithstanding any other provisions of this SOW, the contractor shall comply with all U.S. laws. In the case of inconsistencies, the contractor shall contact the Administrative Contracting Officer (ACO), identify the inconsistency, and seek guidance. All performance shall meet Army regulatory standards unless otherwise stated."

iii. Contract DAAA09-02-D-0007 Task Order 89 SOW - LOGCAP STATEMENT OF WORK (SOW) MNF/MNC-I SITES dated 10 Apr 2005 and subsequent changes Paragraph 1.1: "General. Except as otherwise provided, the contractor shall comply with all Host Nation, local laws, and U.S. laws. In the case of inconsistencies, the contractor shall contact the Administrative Contracting Officer (ACO), identify the inconsistency, and seek guidance. All performance shall meet Army regulatory standards unless otherwise stated."

iv. Contract DAAA09-02-D-0007 Task Order 139 SOW - LOGCAP STATEMENT OF WORK (SOW) MNF/MNC-I SITES dated 08 August 2006 and subsequent changes, Paragraph 1.4: "The contractor shall be available to perform all services 24 hours a day, 7 days a week in accordance with all applicable Army regulations and with the USCENTCOM Regulation 415-1, Contingency and Long Term Base Camp Facilities Standards dated 1 DEC 04, "The Sandbook." Task Order 139 SOW Paragraph 1.1.3 also is consistent with previous Task Orders in that it states: "In the case of inconsistencies, the contractor shall contact the Administrative Contracting Officer (ACO), identify the inconsistency, and seek guidance."

b. **Applicable Army Regulations (ARs):** AR 420-1 *Army Facilities Management* (Attachment 2) addresses the management of Army facilities. Specifically, it describes the management of public works activities, housing and other facilities operations and management, military construction program development and execution, master planning, utilities services and energy management, and fire and emergency services. Also, it identifies and synopsizes other regulations that provide detailed facilities management policy. It is the applicable Army Regulation for facilities and utility construction, inspection, repair, and maintenance requirements outlined in Task Order 139 paragraphs 8.1 through 8.6 and like services in the previous task orders.

i. Below are abridged overviews of the Task Order 139 requirements which include requirements for construction, electrical maintenance, repair, grounding and bonding of facilities and utilities that are covered by AR 420-1 [emphasis and comments added as indicated]:

A. **8.1. Facilities Management and Operations & Maintenance (O&M) Services:** Inspect facilities. Repair facilities prior to assuming O&M. Perform repair and maintenance on facilities and equipment. Maintain a Service Order Request (SOR) system to repair and maintain facilities and equipment.

B. **8.2. Other Construction/Engineering Services:** Evaluate [i.e., inspect], upgrade or refurbish [classified as construction] hardstand buildings to a safe and livable condition.

C. **8.3 Power Generation Management:** Provide [i.e., construct] power production and distribution.

D. **8.4. Electrical Distribution:** Replace, maintain, and repair electrical distribution systems and equipment to include, but not limited to, switchgear, distribution panels, lighting, and electrical outlets.

E. **8.5. Latrines:** Provide, emplace [i.e., construct], and maintain environmentally controlled latrines units.

F. **8.6. Ablution Units:** Provide, emplace, and maintain environmentally controlled ablution units.

ii. AR 420-1 was published November 2007 and superseded the following regulations. The highlighted regulation, AR 420-49, was the most relevant regulation in effect prior to November 2007:

A. AR 11-27 *Army Energy Program* 02/03/1997

B. AR 210-50 *Housing Management* 10/03/2005

C. AR 415-15 *Army Military Construction And Nonappropriated- Funded Construction Program Development And Execution* 06/12/2006

D. AR 420-10 *Management Of Installation Directorates Of Public Works* 04/15/1997

E. AR 420-18 *Facilities Engineering Materials, Equipment, And Relocatable Building Management* 01/03/1992

F. AR 420-49 *Utility Services* 09/19/2005 which superseded the APR 97 version (Attachment 3).

G. AR 420-70 *Buildings And Structures* 10/10/1997

H. AR 420-72 *Transportation Infrastructure And Dams* 05/01/2000

I. AR 420-90 *Fire And Emergency Services* 10/04 /2006

iii. AR 420-1 includes requirements for electrical repair, maintenance, grounding and bonding [emphasis added as indicated]:

A. Chapter 23 addresses utility services. Section VIII of Chapter 23 covers Electric. Paragraph 23-47 establishes policy and criteria for electric systems operation, maintenance, repair, and construction. Paragraph 23-47b states: "Maintenance and repair will be in accordance with National Fire Protection Association (NFPA) 70B, TM 5–683, TM 5–684, TM 5–685, and NFPA 780. Safety procedures described in NFPA 70E, EM 385-1-1, UFC 3-560-01 and the National Electrical Safety Code (NESC)

(http://standards.ieeee.org/nesc/) will be followed while performing maintenance and repair."

B. National Fire Protection Association (NFPA) 70 is the National Electric Code (NEC).

C. National Fire Protection Association (NFPA) 70B is the recommended practice for electrical equipment maintenance.

D. TM 5-683 (Attachment 4) is the Joint Technical Manual for *Facilities Engineering - Electrical Interior Facilities*. Chapter 1.3 is *Codes and Specifications*. Subparagraph 1.3.b outlines the NEC. Chapter 8 covers grounding.

E. TM 5-684 (Attachment 5) is the Joint Technical Manual for *Facilities Engineering - Electrical Exterior Facilities*. Chapter 1.3 is *Applications of Codes and Publications*. Subparagraph 1.3.a (1) is the NEC. Chapter 10 covers grounding.

F. TM 5-685 (Attachment 6) is the Joint Technical Manual for *Operation, Maintenance and Repair of Auxiliary Generators*. Chapter 2.8 is *Grounding*. Paragraph 2.8.g cites the NEC and outlines NEC requirements.

G. NFPA 780 is the standard for installation of lightning protection.

H. AR 420-1, Paragraph 23-52b establishes the U.S. Army Installation Management Command's criteria for testing grounds and grounding systems. Such tests will be IAW TM 5-684, NFPA 70B, and the NEC.

iv. AR 420-49 *Utility Services* is the applicable Army Regulation for electrical services in effect prior to AR 420-1.

A. The version dated 28 April 1997, in effect during Task Order 59 and the first five months of Task Order 89, states the following and is consistent with the requirements of AR 420-1 with one exception - TM 9–1300–206.

a. Paragraph 8-1. Electric systems operation, maintenance, repair, and construction - subparagraph b: "Maintenance and repair will be in accordance with National Fire Protection Association (NFPA) 70B, TM 5–683, TM 5–684, TM 5–685, and TM 9–1300–206."

b. Paragraph 8–6 Grounding facilities, subparagraph b: "Test grounds and grounding systems in accordance with TM 5–684, TM 9–1300–206, and the NEC [emphasis added]."

B. The version dated 19 Sept 2005, in effect during Task Order 89 and the first fifteen months of Task Order 139, states the following and is consistent with the requirements outlined in AR 420-1 with one exception - TM 9–1300–206:

a. Paragraph 8-1 Electric systems operation, maintenance, repair, and construction - subparagraph b: "Maintenance and repair will be in accordance with National Fire Protection Association (NFPA) 70B, TM 5–683, TM 5–684, TM 5–685, and TM 9–1300–206."

b. Paragraph 8–6. Grounding facilities, subparagraph b: "Test grounds and grounding systems in accordance with TM 5–684, TM 9–1300–206, and the NEC [emphasis added]."

C. Comparison of electrical maintenance, repair, and grounding requirements in AR 420-1, AR 420-49 (Apr 97), and AR 420-49 (Sep 05) show that there is only one change in the requirement:

a. Electric systems operation, maintenance, repair, and construction: AR 420-1 substitutes NFPA 780 for TM 9-1300-206, *Ammunition And Explosives Standards,* in both versions of AR 420-49.

b. Grounding facilities: AR 420-1 substitutes NFPA 70B for TM 9-1300-206, *Ammunition And Explosives Standards,* in both versions of AR 420-49.

c. **Construction Standards:** While the standards for electrical repair and maintenance outlined above were included in applicable regulations, the Iraq task orders since Task Order 89 (May 2005) also included explicit requirements for construction standards that again tie to the NEC. The following outlines the history and requirements for construction under Iraq Task Orders:

i. Task Order 89 SOW - subparagraph 8.3.1 Hardstand Buildings: "When directed by the ACO, the contractor shall evaluate, repair, or refurbish hardstand buildings to a safe and livable condition. This work may include repairs, refurbishment, construction and alterations. All work will be in accordance with US UFC standards [emphasis added]."

ii. Task Order 139 Base and Change 1 SOWs - subparagraph 8.2.1. Refurbishment: "The contractor, in coordination with the LSO, Base Camp Mayor and at the direction of the ACO, shall evaluate, upgrade or refurbish hardstand buildings to a safe and livable condition. This new work may include refurbishment, construction, alterations and upgrades. All new work shall be in accordance with International Building Code and British Standard 7671 [emphasis added]."

iii. Task Order 139 SOW Change 2, dated 18 Feb 07, changed the requirement in subparagraph 8.2.1 to the following (the construction standards remained consistent through Change 6 of the TO 139 SOW): "All new work shall be in accordance with International Building Code and British Standard 7671. As dictated by the Unified Facilities Criteria (UFC) "the minimum requirements of National Fire Protection Association (NFPA) 70, National Electrical Code (NEC), and the American National Standards Institute (ANSI) C2, National Electrical Safety Code (NESC), must be met" when it is reasonable to do so with available materials. When conditions dictate deviation, then provisions within the International Electrical Code (IEC) or British Standard (BS 7671 will be followed [emphasis added]."

iv. Tracing electrical requirements specified in the construction standards listed above:

A. UFC 3-520-01, June 10, 2002, paragraph 10-2 includes NEC Grounding and Bonding requirements.

B. The ICC-EC is the Electrical Code used by the International Building Code series (see chapter 27). From the ICC-EC code book: "1201.1.1 Adoption. Electrical systems and equipment shall be designed and constructed in accordance with the International Residential Code or NFPA70 as applicable, except as other wise provided in this code." Note again, that NFPA70 is the NEC.

C. Standards referenced in the ICC International Electric Code (IEC) include NFPA 70 (the NEC).

d. **Library Requirement**: Not only was performance required IAW Army Regulations /Army regulatory guidance since contract award (LOGCAP SOW 1.4), emphasized in each task order, KBR was also required to maintain a library of all applicable publications. This is relevant to point out because it further demonstrates that KBR should have been aware of these regulatory and other published requirements. The paragraphs below highlight task order SOW requirements to maintain a library of applicable regulations and publications. Included among the "Appendix H" SOW references below are the International Building Code and British Standards 7671.

i. TO 89 SOW - Paragraph 2.0. "APPLICABLE DOCUMENTS: The contractor shall maintain a current library of all applicable publications associated with the requirements of this SOW. The following list of documents is provided for contractor reference and shall not be construed as a comprehensive list of applicable guidance or standards of performance, and shall not supersede the requirements specified in Paragraph 1.1 or elsewhere in this SOW [emphasis added]."

ii. TO 139 Original SOW through Change 5 – Paragraph 2.0. "APPLICABLE DOCUMENTS: The contractor shall maintain a current library of all applicable publications associated with the requirements of this SOW. A list of regulations, SOPs, policies, and memoranda can be found in Appendix H to this SOW."

iii. TO 139 SOW Change 6 – Paragraph 2.0. "APPLICABLE DOCUMENTS: The contractor shall research, order or download and maintain a current library of all applicable publications associated with the requirements of this SOW. The contractor is responsible to ensure all applicable documents are on hand. A list of regulations, SOPs, policies, and memoranda can be found in Appendix H (Reference Documents) to this SOW, or within the SOW itself. Not withstanding the list provided within the SOW, the contractor is responsible to ensure that all work performed by the contractor is in compliance with all regulations and guidance issued for performance of Army work in the location performed. Contractor shall maintain all such regulations and directions in their current library."

iv. TO 39 Original SOW through 5 included the following requirements in Appendix H:

"H.1.0. Applicable Documents: The contractor shall maintain a current library of all applicable publications associated with the requirements of this SOW. The

following list of documents is provided for contractor reference and shall not be construed as a comprehensive list of applicable guidance or standards of performance, and shall not supersede the requirements specified in Paragraph 1.1 or elsewhere in this SOW: Section - 1.98. - International Building Code and British Standards 767."

e. **National Fire Protection Association (NFPA) 70: National Electric Code (NEC), Grounding, and Bonding:** Task order requirements trace principally to the National Electric Code which includes standards for bonding and grounding. Army Regulations and Technical Manuals trace to the NEC and NEC requirements; the Unified Facilities Criteria (UFC) traces to the NEC and NEC requirements; and the International Building Code (IBC) traces to the NEC and NEC requirements. Where requirements trace to other standards, such as the British Standard 7671, basic requirements for grounding and bonding and other electrical safety practices are fundamentally the same. The commonality of electrical codes is electrical safety for persons and property. If KBR determined that the Code requirements within the contract and task orders conflicted or were inconsistent, then KBR was required to notify the Government and seek guidance/clarification (Reference: Task Order (T.O.) 59 paragraph 1.1; T.O. 89 paragraph 1.1; T.O. 139 paragraph 1.1.3.). Elements of the NEC are outlined below, but are not meant to imply that these are the only elements of the NEC that apply to the contract nor the only elements important for electrical safety.

   i. **NEC 2005 Handbook; Article 90 Introduction; Section 90.1 Purpose:**

      A. "**(A) Practical Safeguarding** The purpose of this *Code* [the NEC] is the practical safeguarding of persons and property from the hazards arising from the use of electricity."

      B. "**(B) Adequacy** This *Code* contains provisions that are considered necessary for safety. Compliance therewith and proper maintenance results in the installation that is essentially free from hazard but not necessarily efficient, convenient, or adequate for good service or future expansion of electrical use."

      C. "**(C) Intention** This *Code* is not intended as a design specification or an instruction manual for untrained persons."

      D. "**(D) Relation to Other International Standards** The requirements in this *Code* address the fundamental principals of protection for safety contained in Section 131 of International Electrotechnical Commission Standard 60364-1, *Electrical Installations of Buildings*.

         FPN: IEC 60364-1, Section 131, contains fundamental principles of protection for safety that encompass protection against electric shock, protection against thermal effects, protection against overcurrent, protection against fault currents, and protection against overvoltage. All these potential hazards are addressed by the requirements in this *Code*."

   ii. **NEC 2005 Handbook; Article 250 Grounding and Bonding;**

A. **Section 250.2 Definitions**

a. **"Effective Ground-Fault Current Path.** An intentionally constructed, permanent, low impedance electrically conductive path designed and intended to carry current under ground-fault conditions from the point of a ground fault on a wiring system to the electrical supply source and that facilitates the operation of the overcurrent protective devices or ground fault detectors on high-impedance grounded systems."

b. **"Ground Fault.** An unintentional, electrically conducting connection between an ungrounded conductor of an electrical circuit and the normally non-current-carrying conductors, metallic enclosures, metallic raceways, metallic equipment, or earth."

c. **"Ground-Fault Current Path.** An electrically conductive path from the point of a ground fault on a wiring system through normally non-current-carrying conductors, equipment, or the earth to the electrical supply source."

B. **Section 250.4 General Requirements for Grounding and Bonding**: "The following general requirements identify what grounding and bonding of electrical systems are required to accomplish. The prescriptive methods contained in Article 250 shall be followed to comply with the performance requirements of this section.

a. **(A) Grounded Systems**

i. **(1) Electrical System Grounding** Electrical systems that are grounded shall be connected to earth in a manner that will limit the voltage imposed by lightning, line surges, or unintentional contact with higher-voltage lines and that will stabilize the voltage to earth during normal operation.

ii. **(2) Grounding of Electrical Equipment** Non-current-carrying conductive materials enclosing electrical conductors or equipment, or forming part of such equipment, shall be connected to earth so as to limit the voltage to ground on these materials.

iii. **(3) Bonding of Electrical Equipment** Non-current carrying conductive materials enclosing electrical conductors or equipment, or forming part of such equipment, shall be connected together and to the electrical supply source in a manner that establishes an effective ground fault current path.

iv. **(4) Bonding of Electrically Conductive Material and Other Equipment** Electrically conductive materials that are likely to become energized shall be connected together and

to the electrical supply source in a manner that establishes an effective ground fault current path.

v. **(5) Effective Ground-Fault Current Path** Electrical equipment and wiring and other electrically conductive material likely to become energized shall be installed in a manner that creates a permanent, low impedance circuit facilitating the operation of the overcurrent device or ground detector for high impedance grounded systems. It shall be capable of safely carrying the maximum ground-fault current likely to be imposed in it from any point on the wiring system where a ground fault may occur to the electrical supply source. The earth shall not be considered as an effective ground fault current path.

b. **(B) Ungrounded Systems**

i. **(1) Grounding Electrical Equipment** Non-current carrying conductive materials enclosing electrical conductors or equipment, or forming part of such equipment, shall be connected to earth in a manner that will limit the voltage imposed by lightning or unintentional contact with higher voltage lines and limit the voltage to ground on these materials.

ii. **(2) Bonding Electrical Equipment** Non-current carrying conductive materials enclosing electrical conductors or equipment, or forming part of such equipment, shall be connected together and to the supply system grounded equipment in a manner that creates a permanent, low-impedance path for ground-fault current that is capable of carrying the maximum fault current likely to be imposed on it.

iii. **(3) Bonding of Electrically Conductive Materials and Other Equipment** Electrically conductive materials that are likely to become energized shall be connected together and to the supply system grounded equipment in a manner that creates a permanent, low-impedance path for ground-fault current that is capable of carrying the maximum fault current likely to be imposed on it.

iv. **(4) Path for Fault Current** Electrical equipment, wiring, ant other electrically conductive material likely to become energized shall be installed in a manner that creates a permanent, low-impedance circuit from any point on the wiring system to the electrical supply source to facilitate the operation of overcurrent devices should a second fault occur on the wiring system. The earth shall not be considered as an effective fault-current path."

f. **Requirements Summary:** The contract and task order requirements for services that include electrical maintenance, repair, inspection, or construction are meant to provide safeguards of persons and property from the hazards arising from the use of electricity. The basic premise of the NEC, Article 250 Grounding and Bonding, is to outline performance requirements. The contract requirements identified above and the NEC, Article 250, provide fundamental principles that encompass protection against electric shock, protection against thermal effects, protection against overcurrent, protection against fault currents, and protection against overvoltage.

2. **NONCONFORMANCE(S):** The paragraph above clearly outlines the contract requirement for electrical work under the contract/task order. Finding #1 addresses the failure of KBR personnel to meet the minimum requirements for adequately performing electrical system work and for inspecting electrical distribution systems, grounding and bonding systems, and general facilities inspection procedures in accordance with ARs, TMs, SOWs, and the NEC. KBR inspectors failed to adequately inspect the electrical distribution systems to ensure that systems installed were in compliance with the NEC. KBR inspectors also failed to properly inspect the grounding and bonding systems and document deficiencies for necessary repairs. These failures have persisted despite the CARs issued by the Government identified below in Finding #2.

   a. **Finding 1 - Nonconformance # 1 - Grounding and Bonding:** KBR failed to adequately construct, inspect, repair, or maintain facilities IAW grounding and bonding electrical system standards. The following subparagraphs outline examples of KBR's failure to comply with the LOGCAP contract SOW paragraph 1.4, Army Regulation 420-1, the NEC, Task Order 139 SOW paragraph 8.2.1, the contract quality requirements of FAR 52.246-5, the LOGCAP contract SOW paragraphs 1.14 and 8.4, and KBR's Government accepted Quality Control Plan as outlined below in Finding #2. There were three separate Government teams that recently conducted the inspections of KBR maintained facilities at the request of DCMA to provide independent assessments of KBR's performance.

      i. **Example # 1 - USACE Inspection** (Attachment 7): The independent inspections of the facilities noted below were conducted by representatives of U.S. Army Corps of Engineers (USACE) Gulf Region Division Central District (GRC) at the Radwaniyah Palace Complex (RPC) (D9). On 29-30 July 2008, the team from USACE conducted a detailed visual inspection of three buildings (91, 57, Radwaniyah Palace) and a substation located within the Victory Base Complex. USACE's inspection was conducted in support of DCMA to assess KBR's performance related to services that included electrical inspection, construction, repair, operations and maintenance. Buildings 91, 57, the Radwaniyah Palace, and substation were inspected and found to have serious National Electric Code (NEC) violations associated with bonding and grounding of conductors which presented an electrical shock and fire hazard.

         A. **Building 91:** When inspected, Building 91 had recently undergone a renovation by KBR. The USACE team removed the "raised cover" on surface mounted four square boxes in two locations. The equipment grounding conductor was not bonded to the four square boxes violating NEC 250.148(C) (Attachment 8) and presenting an electrical hazard to the user.

            a. Within the same four square boxes, the ungrounded conductor was attached to the devices by crimp connectors. The crimp connectors were not correctly installed per NEC 110.14 "Electrical

Connections." The ungrounded conductor fell off the devices when the covers were removed. This creates an electrical hazard for the user.

b. Building 91 failed to have a properly protected "general purpose" outlet in the bathroom as required by NEC 210.8(A) (1).

c. The electrical bonding jumper had been incorrectly installed per NEC 250.104. (Bonded is the permanent joining of metallic parts to form an electrically conductive path that ensures electrical continuity and the capacity to conduct safely any current likely to be imposed per NEC) (Attachment 8).

d. Electric cable from a generator was utilizing steel armor as a grounding conductor. This is a violation of NEC 250.122 "Size of Equipment grounding conductor." The steel armor is not equivalent circular mill, or large enough, for use as a grounding conductor. Steel armor is not an NEC approved equipment grounding conductor (Attachment 8). In this application, the steel armor shall be grounded at one end only. This prevents the steel armor from being a current carrying conductor from load to source.

e. Rain-tight exterior grade boxes and fittings were not being installed for exterior construction per NEC 314.15(A), *"Damp or wet locations."*

f. At the distribution point for Building 91, a cable had been directly bolted to a 1,000 amp protected bus without use of a circuit breaker in violation of NEC 240.21, *"Location of Current Protection in a circuit."* (Attachment 8) When questioned about this, the workman explained this was done because he did not have all the parts to connect the bus to the breaker.

B. **Building 57:** Building 57 was completely rewired by KBR, to include new branch circuits and devices from new circuit breaker panels. Per direction from the ACO, a TI was requested from KBR prior to listing on the O&M Appendix "F." The TI by KBR failed to reveal two critical faults in the installation.

a. A bonding jumper was not installed per NEC 250.96(A), *"Bonding general."* (Attachment 8) The earth shall not be considered an effective ground-fault current path as was being utilized in this application.

b. Water piping was not bonded per NEC 250.104(A) (1).

C. **Radwaniyah Palace:** The Main Distribution Panel was energized; therefore the USACE team could not complete a thorough inspection. The panel has separate neutrals and grounds (un-bonded).

a. Substation has medium voltage feed with 11kv – 200/400 XFMR's. Medium Voltage is overhead feed to pole mounted cut-outs feeding underground cable into substation. Cut-outs have fuses removed and solid metal bars installed. KBR is shutting off the power on the following day. Returning to check gear when power is shut off.

b. Returned next day and KBR could not explain to the Government Quality Assurance Representative (Master Electrician – Authority Having Jurisdiction) if the electrical system installed was a four or five wire system. Therefore, code compliant grounding and bonding method could not be determined. KBR used jumper cables to connect the ground conductor to a phase. This was done to check the continuity of the ground. This is not a proper test due to back-feeding through windings. The cables must be removed or all switches opened. Generator conductors are undersized. The Automatic Transfer Switch is using two 400 amp breakers to parallel 800 amps into the substation. This violates NEC 240.8.

ii. **Example # 2 - Army Combat Readiness / Safety Center Inspection:** The independent inspection of facilities noted below was conducted on or about 15 August 2008 by representatives of the Army Combat Readiness/Safety Center (Attachment 9).

A. **Camp Victory DCMA/LOGCAP Compound Building L-9:** Electrical service for the facility is supplied through an 80-Amp panel which is located outside the building. The service is fed by four wires (three ungrounded conductors and one grounded (neutral)). The ground bus was connected to the ground electrode and equipment grounding conductors. The ground bus was not connected to the neutral bus (no effective ground fault path) violating NEC 250.90 "Bonding" (Codes). Inside building breaker panels were not wired per the drawing on the cover, violation of NEC 408.4 (Attachment 8). Water was discovered in the electrical junction box located on the water heater. The circuit breaker was immediately turned off and the hot water heater was replaced due to the hazardous LHS condition.

B. **Camp Victory Audie Murphy LSA:** Main Disconnect Panel, Subpanel, Latrine and Shower.

a. Main Disconnect Panel (MDP). The feeder cable from generator comprised of three ungrounded and one grounded (neutral) conductors. The mechanical shield from armor cable utilized as ground conductor does not provide adequate grounding. Ref: NEC 250.118, NEC 250.102 and NEC 250.122 122 to include paragraph and table (Attachment 8).

b. Subpanel. The feeder cable from MDP made of three ungrounded and one grounded (neutral) conductors. Mechanical shield from armor cable utilized as ground conductor and does not provide adequate grounding. Ref: NEC 250.118, NEC 250.102 and NEC 250.122 122 to include paragraph and table (Attachment 8). There is no evidence of ground and neutral bonded together in main

disconnect or subpanel which would provide an effective ground-fault current path.

c. Latrine and Shower. Mechanical shield of armor cable utilized as an unsuitable grounding conductor. Ref: NEC 250.118, NEC 250.102 and 250.122 to include paragraph and table (Attachment 8).

C. **Camp Victory Gym**: Main distribution panel fed by a four conductor cable, three ungrounded and one grounded (neutral). The panel was not bonded between neutral and ground bus bars. Ref: NEC 250 (Attachment 8).

D. **FOB Loyalty Mayor Cell Building 25:**
   a. Panel 1, 250-Amp service missing ground conductor. Ref: NEC 250 (Attachment 8).

   b. Electrical receptacles inside building - missing and cracked covers. Ref: NEC 110.12.

   c. Outside building electoral circuits were not weather-proof. Splices in wiring not completed in junction box. Wiring not secured to building. Ref: NEC 110.12.

E. **FOB Loyalty Building 11- Living Quarters:** Assessment – Not safe, no effective ground fault path.

   a. No grounding conductor at electrical panel. Ref: NEC 250 lines 3-9.

   b. Building water pipes and structure not bonded to ground. Ref: NEC 250.14.

F. **FOB Loyalty Building 34A Male Shower**: Assessment: Building has no effective ground fault current path. Main electrical service missing ground conductor. Violation of NEC 250 (Attachment 8).

G. **FOB Loyalty Building 2:** Living Quarters Assessment: Building has no effective ground fault current path. Main electrical service missing ground conductor. Ref: NEC 250 (Attachment 8).

H. **FOB Loyalty Dining Facility (DFAC):**

   a. Undersized wires connected to 60-Amp circuit breaker. Ref: NEC 240, NEC table 310.16.

   b. Multiple bonding points throughout facility electrical system will result in parallel current paths of the neutral and ground conductors returning to main disconnect. Current on equipment grounding conductors is unacceptable and can result as an electrical hazard.

I. **FOB Loyalty Gym**: No effective ground fault path for panel, ground conductor missing. Ref: NEC 250 (Attachment 8).

J. **FOB Loyalty Building 40:** Living quarters and office space. No effective ground fault path for panel, ground conductor missing. Ref: NEC 250 (Attachment 8).

K. **FOB Loyalty Pool:** No effective ground fault path for panel, ground conductor missing. Ref: NEC 250 (Attachment 8).

L. **FOB Loyalty Laundry SDP**: No effective ground fault path for panel, ground conductor missing. Ref: NEC 250 (Attachment 8).

M. **RPC Complex – LSF1:** The piping of the system was not bonded to the ground system. Ref: NEC 250.

iii. **Example #3 - Camp Slayer CIR** (Attachment 10): The following outlines the results of a Critical Incident Report (CIR) finding that demonstrates KBR's failure to properly ground and bond Camp Slayer (F3) Ablution Unit CD-3: On 7 Aug 08, two related electric shock incidents occurred in a female Ablution (AB) Unit CD-3 on Camp Slayer within 3 hours of each other. The attachment provides detailed documentation of the incident.

A. KBR conducted an inspection after the first shock (with KBR QA/AC present) and did not identify any electrical deficiencies. The facility was "closed" for further testing utilizing a sign placed upon a chair. The lack of "positive" control measures enabled a second soldier to enter the unit.

B. KBR received a service call stating another solder was shocked while in the ablution unit CD-3 located on Camp Slayer. KBR identified the problem as a screw in contact with wires in the light switch and repaired. KBR's Technical Professional, (Electrical) checked the ground rod readings, electrical devices, water pump, water heaters, bond on the cold water lines, and found no deficiencies. He instructed the site electrician to make a closed circuit and the electrician installed bonding jumpers to connect the three supplemental ground rods.

C. On 8 Aug 08, DCMA conducted a detailed inspection and discovered loose cables inside the breaker box (two jumpers were not properly secured). KBR was correct in its assessment that the screw in the light switch was the cause. The electrical hazard, however, was primarily due to an improperly grounded switch. Had the switch been grounded, and the grounding system bonded, the overcurrent device would have opened, thus eliminating the hazard at the energized screw.

iv. **Example # 4 - TF SAFE Inspection:** The independent inspection of areas noted below was conducted by representatives of MNF-I Task Force SAFE.

A. **Al Asad (BI)** (Attachment 11): On 08/09/08, an inspection was conducted of building 10-112 which had been vacated by personnel due to a shock in one of the shower units. The following was discovered:

a. The fuse blocks were burnt at the main distribution.

b. The generator was installed with a transfer switch and roof top 3 phase A/C units. It was determined there was not a grounded (neutral) conductor to the building. Ref: NEC 110.12 and 110.114.

c. The conductor was taped and appeared to have been crimped into the grounded bar at one time. Without this grounded connection the single phase circuits were changed from 200v parallel circuits to 400v series circuits.

d. This also could cause the grounding conductor going to the transfer switch and the A/C unit to become a current carrying conductor.

e. Ablution unit between buildings 10-118 & 10-116 was feeding from building 10-118 through a 4 wire cord (3 ungrounded conductors and a grounded conductor). The ablution unit had a 5 wire power receptacle which indicated the buildings may have been built for 5 wire construction. Upon opening the panel covers, it was determined the building was wired for 5 conductors. Because the grounding terminal bars in the panels were not bonded, there was not a fault current path present, rendering the ablution units very dangerous. These ablution units were moved into place to provide safe facilities, yet they were not safe.

B. **Victory Base Complex:** An inspection was conducted 11 Aug 2008 of the Raven Compound, Camp Deutsch (F3 Camp Slayer), Military LSA –Slayer, Pad 10 Liberty, and Audie Murphy LSA, Camp Victory. This inspection, by TF SAFE, was conducted in support of DCMA to assess KBR's performance related to services that included electrical inspection, construction, repair, operations and maintenance.

a. **Raven Compound – Camp Slayer F3** (Attachment 12): Inspection of subpanel 10 located near tent #19 resulted in the following findings. (1) Undersized wire connected to 100-Amp circuit breaker. Reference NEC 310.16. (2) Environment Control Unit ECU, GP #L890376 40-amp fuse/breaker required for proper protection connected to a 63-Amp disconnect and 63-Amp circuit breaker. Reference NEC 440.4(c). (3) Mechanical shield from armor cable does not provide adequate grounding. Ref: NEC 250.102 and 250.122 paragraph and table.

b. **Raven Compound - Camp Slayer F3** (Attachment 13): Inspection of Subpanel 14 located in area of Ablution Unit CR-5 resulted in the following finding. Grounding and bonding conductors found to be undersized per Table 250.122 of the NEC.

c. **Raven Compound - Camp Slayer F3** (Attachment 14): Ablution Unit CR-5 inspection concluded with one deficiency. Mechanical shield of armor cable utilized as an unsuitable grounding conductor. NEC 250.102 and 250.122 paragraph and table.

d. **Camp Deutsch - Camp Slayer – F3:** Street lighting panel outside Ablution Unit BA-2 (Bldg 942). No evidence of ground conductor connected between panel and metal light/power pole. In the event light fixture shorted, potential exist for electrical hazard. Ref: NEC 250.96(a).

e. **Camp Deutsch - Camp Slayer - F3 Ablution Unit BA-2 (Bldg 942 - Outside)** (Attachment 15): Switch orientation for sump and water pumps inverted, posing as an electrical hazard to personnel performing maintenance on equipment. Ref: NEC 404.6 (a).

f. **Camp Deutsch - Camp Slayer – F3 Male Shower/Latrine CD-12** (Attachment 16): Inspected circuit breaker panel box mounted outside. Ground conductor mounted to plastic portion of electrical panel. No bond from grounding terminal to metal panel enclosure. Ref: NEC 250.96(a).

g. **Camp Deutsch - Camp Slayer - F3 Female Shower/Latrine CD-5.** (Attachment 17): Exterior panel box missing bond from earth ground to panel enclosure. NEC Violation 250.

h. **Camp Deutsch - Camp Slayer - F3:** Female Shower/Latrine CD-5. Interior panel box failed to have proper bonding and ground was not tied to neutral bar. NEC Violation 250.

i. **LSA G Ablution Unit S-8, Camp Slayer F3** (Attachment 18): Interior panel, wire connected to water heater from circuit breaker shows evidence of overheating and not properly color coded. NEC Violation 250.119.

j. **LSA G Latrine Unit S-7, Camp Slayer F3** (Attachment 19): Interior panel, loose wire connected to circuit breaker. NEC 110.4(a).

k. **LSA G CHU #316A Camp Slayer F3** (Attachment 20): Ground conductor utilized in panel box incorrect size. Ref: NEC 110.4.

l. **LSA Pad 10 Male Latrine Building 10-453, Camp Liberty F2** (Attachment 21): Mechanical shield of armor cable utilized as an unsuitable grounding conductor. Ref: NEC 250.118, NEC 250.102 and 250.122.

m. **LSA Pad 10 Female Shower/ Latrine Building 10-443 Camp Liberty F2:** Ground conductor not attached to following switches-fan, vanity light, and main lighting. Ref: NEC 404.12.

n. **Audie Murphy LSA Male Shower/Latrine SL-1 Camp Victory F1** (Attachment 22): Mechanical shield of armor cable utilized as an unsuitable grounding conductor. Ref: NEC 250.118, NEC 250.102 and 250.122.

o. **Audie Murphy LSA Toilet #3 Camp Victory F1:** Disconnect plug utilized for air conditioner rated for 20-Amps, circuit connected to 25-Amp circuit breaker. Ref: NEC 210.21.

p. **Audie Murphy LSA Water Heater #3 Camp Victory F1** (Attachment 23): Wire from water heater to circuit breaker undersized. Ref: NEC 240.4 (d) and Table 310.16.

b. **Finding 1 - Nonconformance # 2 Technical Inspections:** KBR's facilities inspection procedures were not IAW the SOW, AR 420-1, and the NEC.K BR failed to meet the minimum requirements for adequately inspecting electrical distribution systems, grounding and bonding systems, and general facilities inspection procedures. This is demonstrated below by a review of KBR's technical inspection sheets as well as examples of KBR employees failing to detect nonconforming conditions:

i. **Example # 1 - TI Sheets**: On 29-30 July 2008, a USACE team reviewed KBR's Technical Inspection (TI) reports. (This was the same team that inspected facilities as described on page 12 above.) This review was conducted in support of DCMA in order to assess KBR's performance related to services that included electrical inspection, construction, repair, operations and maintenance. Finding: The KBR TI forms (Attachment 24) failed to provide adequate information to identify life-threatening conditions on tanks, water pumps, electrical outlets and panels. Water pumps were not inspection items on either the electrical or the plumbing TI sheets. This is despite the fact that a soldier died of electrocution involving a water pump in January 2008. Hot water heaters were listed on the plumbing TI sheet with insufficient requirements for verifying proper grounding and bonding. The current TI forms fail to clearly document the exact location of known deficiencies which requires the repair technician to conduct additional technical inspections in order to locate deficiencies 9wasting time and resources). In preparing this CAR, the USACE team, among them a Master Electrician, offered the following additional comments based on their observations of the forms:

A. If the technician that conducted the initial inspection is not available, it would be impossible to locate the documented deficiency without a re-inspection of the area in question (e.g., four-story building, TI Sheets states electrical wire loose, form does not state on which floor/room).

B. Items listed as "N/A" should mandate a comment as to why the item has been marked N/A. For example, on the Palace outside TI report, the section for electrical heaters, motors and fans has been marked N/A, although these items are located outside. If these items are captured elsewhere within another report, it should be stated as such. However, a search for this information by the team resulted in the acknowledgement that these items were overlooked.

C. The reading and inspection for grounding was not provided within the report. Failure to provide actual readings of the grounding system fails to provide the reviewer/agency with the possible problems associated with grounding. Therefore, the end user would not be able to ascertain if the grounding

system is in compliance with NEC code 250.56 "Resistance of Rod, Pipes, and Plate Electrodes."

D. The TI form does not clearly inform the reviewer of life threatening issues. The report fails to clearly notify the agency of what the inspector feels is a life threatening issue that requires immediate action. The report at the palace was conducted on May 17, 2008, yet a review of the site demonstrates that hazardous deficiencies still exist.

E. The TI sheets provided by KBR failed to provide pertinent information necessary to evaluate the safety of the building.

F. The plumbing report fails to require the inspection of water service lines as to proper bonding and grounding.

G. The reports are lacking in details and at times very conflicting.

ii. **Example # 2 - Al Asad:** 4/6/2008. KBR Electrical Preventive Maintenance inspector at Al Asad, took exactly twenty minutes for each unit inspected. Out of the 16 units inspected (E31, E38-43, E49A&B thru E53A&B), the KBR inspector failed to log one deficiency. There is no evidence that the KBR inspector's report received the required supervision and review. Upon additional review of Al Asad Electrical Preventive Maintenance inspections reports, it was discovered that the KBR inspector submitted twelve additional reports for April 6, 2008 for Midway Tent City, taking twenty minutes per unit to conduct his inspection. It was noted, however, that both inspections were conducted on the same day at the same time (Attachment 25). The KBR inspector failed to obtain the POC, or the Coordinator's verification signature in accordance with the KBR Preventative Maintenance form. This is just one example of KBR Quality failing to identify trends of poor performance.

iii. **Example # 3 - Camp Slayer**: DCMA conducted a review of weekly Preventive Maintenance (PM) checks performed on Ablution (AB) / Latrine during the period of April – June 2008. Beginning April 2008, four (4) ablution units were documented with bad grounding and GFCI for four (4) consecutive weeks. The grounding deficiencies for AB units CD10, PC-2 R-1, PC-2 R2, and S-2 were noted by the same individual. June 1 -15, 2008 documentation of AB unit CD10 noted the Main GFCI was not working. This is an example of KBR personnel not following KBR Standard Operating Procedures (SOP) 7AA and KBR QA/QC failing to identify the trend in poor performance.

iv. **Example # 4 - Camp Victory Audie Murphy LSA:** Electrical PM inspections accomplished during June 2008 resulted in zero deficiencies. However, Government inspections of the LSA (outlined above in paragraphs ii B and iv B) show numerous deficiencies.

v. **Example # 5 - Camp Liberty Pad 10 LSA**: Minimal deficiencies noted by contractor during the period of April-June 2008. Inspections conducted on 10 May initiated documentation of fifty-eight (58) incorrect ballast installed in twelve (12) AB units.

vi. **Technical Inspection Summary:** At the direction of the Government, beginning with LOTD KBR-08-139X-IRAQ-1037 issued on 26 February 2008, KBR inspected 4,741 hardstand buildings and has completed technical inspections of 40,852 (52%) temporary facilities as of 22 August 2008. These technical inspections were directed to identify LHS facility deficiencies to improve safety of Coalition Forces. The failure of KBR to maintain a technical inspection program IAW the contract requirements, and the Government's discovery of this failure, now requires that these 45,593 facilities be re-inspected. This amounts to a significant amount of rework and cost to the Government and prolonged LHS risks to Soldiers, Sailors, Airmen, Marines, DoD Civilians and Contractor employees.

3. **Finding # 1 Summary**: Contract requirements have included performance IAW Army Regulations since contract award in 2001. Army Regulation 420-1 *Army Facilities Management* and preceding regulations (including but not limited to AR 420-49) document standards for electrical repair, maintenance, grounding, bonding, and construction that included wiring and electrical distribution to and within facilities. The task orders also incorporate explicit standards for construction that contain the same requirements for grounding and bonding that AR 420-1 requires. These standards apply to the following task order requirements: Facilities Management and Operations and Maintenance; Other Construction/Engineering Services; Power Generation Management; Electrical Distribution; Latrines; and Ablution Units.

   Numerous incidents of nonconformance with the requirements in AR 420-1 and the task order construction standards are documented in the examples above. This is despite the fact that: (1) KBR was aware of the requirements to perform IAW the NEC and (2) KBR was aware of the requirements contained in the NEC. These two facts are supported by a review of KBR's own document - *KBR US Mission – Iraq Electrical Requirements Revision 5/12/05* (Attachment 26). Most facilities inspected had electrical deficiencies because KBR failed to consistently follow contract standards every time it constructed or emplaced a facility, inspected a facility, responded to a service order request, or performed maintenance and/or repairs on facilities, generators, and utilities. This demonstrates systemic failures in performance. (Attachment 27 contains SOR and Master Schedule of Work (MSOW) information on the facilities inspected in this Finding.)

   The systemic nature of the nonconformance continued even after the Government made KBR aware of the problem, demonstrated by three examples: (1) As documented in CAR D9-08-139-BLS-0002 LII (Attachment 28), KBR failed to properly ground and bond RPC building # LSF 1 after four different Government inspections between 8/25/08 and 8/31/08. These Government inspections followed the Army Combat Readiness/Safety Center identification that the facility remained unsafe. (2) KBR also failed to follow contract standards on the RPC building 91 renovation / repair, also documented in CAR D9-08-139-BLS-0002 LII following KBR's Quality Completion Report (QCR) (Attachment 29). (3) On 30 August 2008, KBR failed to present a solution that was in conformance with the code during the initial phase of the grounding and bonding proof of principal directed by LOTD KBR 08-139y-Iraq-1071 (Attachment 30). This precipitated direct government coaching in order for KBR to discern methods to correctly ground and bond the Dodge City North Life Support Area (LSA) using a compliant and safe practice.

   In addition, KBR's TI sheets failed to meet basic requirements to identify life-threatening conditions on tanks, water pumps, electrical outlets, and electrical panels. The Government's review discovered that water pump inspections were not incorporated into the checklist after a soldier died of electrocution involving a faulty water pump in January 2008. This review of the TI sheets was after DCMA was informed by KBR senior management that KBR standardized their TI sheets in response to the requirements of LOTD KBR-08-139X-IRAQ-1037 (Attachment 31).

In conclusion, these nonconformances prove KBR's quality system has failed. The systemic nonconformances illustrated above would not have occurred at this magnitude without a systemic failure in KBR's execution of contract requirements for quality and quality control. The failure in KBR's quality system to identify and correct electrical deficiencies resulted in LHS risks to facility occupants, rework at additional cost to the Government, and Government property damage due to electrical fires. As further described in Finding #2 below, KBR had the data available in its Service Order, Fire Fighting, and Fire Hazards Inspection system records, and Corrective Measure Implementation Plans (CMIPs) to determine that the facilities it maintains had serious electrical issues. Finding # 2 therefore specifically addresses and re-enforces that KBR's quality system has failed.

SPECIFIC FINDING #2- QUALITY SYSTEM:

KBR's inspection/quality control system failed to properly identify and systemically correct numerous Program-wide deficiencies in the implementation, administration, and execution of the LOGCAP contract quality requirements of FAR 52.246-5; LOGCAP SOW paragraphs 1.14 and 8.0, and the Government accepted KBR Quality Control Plan (QCP) Rev 5, dated 3 Dec 2007.

Introduction: The LOGCAP contract has multiple requirements for the contractor to maintain an acceptable quality system. These requirements are intended to prevent systemic failures in performance, minimize and/or eliminate rework, and reduce risk to the Government receiving the LOGCAP contract services. The overall intent of the Government is to ensure that KBR's Quality Control System identifies and systematically corrects deficiencies to ensure consistency of support service throughout the LOGCAP contract. This is evidenced by the terms of the contract and KBR's Quality Control Plan (QCP), which was accepted by the Government as a contract deliverable (CDRL 003 –Technical Reports). The LOGCAP SOW states that the contractor will be responsible for coordination of all aspects of performance through establishment of a QCP (Attachment 001, paragraphs 1.14 and 8.4). The QCP (paragraphs 4.0, 6.1, and 9.6.3) specifically requires KBR to implement methods of identifying quality deficiencies before the level of performance becomes unacceptable. Internal controls are required to be established at all levels to ensure consistent implementation of the quality system and trend data (QCP, paragraph 9.2.2) must be utilized to establish audit frequencies in order to identify systemic issues that require corrective measures. KBR is also required to implement continuous improvement measures to improve processes, decrease variation, decrease costs, and improve effectiveness of the organization. KBR must use process procedures and quality data analysis techniques to accomplish this. Additionally, KBR corrective actions must implement measures to prevent recurrence and future deficiencies. The contract also states, in clause H.36, AWARD FEE, that KBR's performance, and resultant award fee, will be evaluated based on technical performance, which includes quality. Quality is addressed in three sections: Quality of Work, Quality Control and Program Initiatives. A high level of quality performance is achieved when KBR: (1) implements changes to its QC procedures that improve the quality performance of work effectively, (2) proactively addresses internal and Government corrective actions, (3) maintains quality documentation, records, and reports, and (4) no Government direction is required. Paragraph 1 below outlines the contract quality requirements that KBR failed to consistently execute. Paragraph 2 of this finding outlines contract quality nonconformances, in addition to those illustrated in Finding #1, with supporting evidence documenting KBR's failure to execute contract quality requirements. KBR's Quality Control System failed to properly identify and systemically correct numerous Program-wide deficiencies in the implementation, administration, and execution of the LOGCAP contract quality requirements of FAR Part 52.246-5; LOGCAP SOW paragraphs 1.14 and 8.0, and the Government accepted KBR Quality Control Plan (QCP) Rev 5, dated 3 Dec 2007. Finding #2 addresses specific failures that include: (1) Failure to Detect Systemic Nonconforming Conditions; and (2) Failure to Implement Measures to Prevent Recurrence.

1. **REQUI REMENT(S):** The following summarizes the contract quality requirements of the LOGCAP contract.

   a. **DAAA09-02-D-0007, the LOGCAP Contract**:

      i. DAAA09-02-D-0007 Section E-4: 52.246-5 Inspection of Services – Cost reimbursement Apr/84 requires the contractor to maintain an inspection system acceptable to the Government covering the services under this contract.

ii. Attachment 001, LOGCAP SOW Paragraph 1.14 Quality Control and Paragraph 8.0 Performance Assessments:

A. Paragraph 1.14 Quality Control states that the contractor will be responsible for the quality, technical, logistical and financial accuracy, and the coordination of all aspects of performance, and as identified in each Task Order, the contractor shall establish and maintain a quality control plan which includes a method of identifying deficiencies in the quality of services performed before the level of performance becomes unacceptable. The contractor will also implement corrective action procedures for deficiencies and implement measures to prevent recurrence.

B. Paragraph 8.4 Inspection System states that the Contractor's inspection system shall contain measures for prompt detection of any condition that fails to conform to the contract requirements. Corrective action procedures shall include, at a minimum, action to correct the deficiency and necessary measures to prevent recurrence of such deficiencies.

b. **KBR LOGCAP Quality Plan, Rev 5:** KBR devloped a Quality Control Plan based on the requirements of the LOGCAP SOW paragraph 1.14. and LOGCAP contract CDRL 003 - Technical Reports. The Government accepted this plan and revisions. While the entire plan is pertinent, the following subparagraphs highlight relevent sections to the nonconformances listed in this CAR. These highlighted sections are not meant to imply that other parts of the plan were necessarily followed; but rather these sectioms demonstrate consistency within KBR's QCP with the requirements of the LOGCAP SOW and the contract's Inspection of Services clause. **[Note: Information in the following subparagraphs (i – vii) contains information from the KBR QCP. The QCP contains markings indicating it is KBR proprietary data and may be subject to the restrictions on the cover page of this document.]**

i. **2.0 Purpose** The purpose of the plan is to establish the criteria and technical basis for auditing, inspecting, controlling, and assuring quality performance/conformance to the LOGCAP contract.

ii. **4.0 Applicability** ...each QM or designee(s) shall maintain close coordination with the Program Quality Manager (PQM) to ensure consistency throughout the LOGCAP contract [emphasis added].

iii. **5.0 Objective**: The objective of the Plan is to establish procedures to eliminate or mitigate quality issues pertaining to KBR performance under the LOGCAP Contract through prevention and continued improvement of our processes and procedures.

iv. **6.0 KBR Commitment to Quality Performance**

A. **6.1 KBR Employee Responsibility:** Quality is a fundamental responsibility of every employee at every level of the work process rather than the assignment of inspectors to inspect each work activity…Internal controls are established at all levels to ensure consistent implementation of the quality system. The internal controls include: reviews, evaluations, corrective measures, documented procedures, and periodic assessments and auditing [emphasis added].

B. 6.2.3 Adopt a system approach to work that defines processes and encourages rational improvement in meaningful areas [emphasis added].

C. 6.2.4 Define and communicate good practices to improve services, reduce and control costs.

D. Paragraph 6.2.7: Use Lean Six Sigma principles and methodologies to improve the way we do business.

v. **7.0 Responsibilities**

A. **7.1 Principal Program Manager (PPM)** The PPM retains ultimate responsibility for KBR quality performance and provision of services under the LOGCAP Contract.

B. **7.2 Project Manager (PM)** The PM is responsible for supervising and monitoring quality, as well as the employees assigned or appointed to perform audits, inspections, prepare reports, conduct compliance reviews and recommend corrective measures and implementation plans within their AOR (Area of Responsibility).

C. **7.3 Program Quality Manager (PQM)** The PQM is responsible for overall development, implementation, execution and continual improvement of Quality within the LOGCAP Contract. The PQM reports directly to the PPM. The PQM advises the PPM and Project Management on problem areas and recommends corrective measures to prevent recurrence. With management autonomy delegated by the PPM, the PQM is accountable for meeting the client's needs, conformance to requirements, and continual improvement.

D. **7.4 Deputy Program Quality Manager (PQM)** The D-PQM will act in place of the PQM absence. He will provide technical support as required to Quality Management Leader (QML) and staff. Through personal visits and interaction, assists the QMs in the performance of their duties.

E. **7.5 Quality Management Leader (QML)** The QML is responsible for assisting the PQM in overall development, implementation, execution and continual improvement of Quality within the LOGCAP Contract in specific areas, such as Quality Support Services, Food Service. Health Safety and Environmental (HSE) and country level management.

F. **7.6 Quality Manager (QM)** The QM is responsible for assisting the PM, PQM and QML's in the implementation and execution of the Plan. The QM has authority directly from the PM for enforcement and execution of the Plan. The QM has full authority in and responsibility for quality matters, including stop work, when required. KBR QM's are provided the necessary support and tools (such as See SOR, SOPs, etc.) to flow information to all levels of personnel within the Quality organization. Through the use of these tools and guidance from the Quality leadership, the QM's utilize this

information to assist them in operating and maintaining their respective organization.

G. **7.7 - Quality Technician/Inspector (QT/I)** The QT/I is responsible for assisting the QM in the implantation and execution of the Plan.

H. **7.8 - Functional Area Manager (FAM)** Each FAM is responsible for verifying, monitoring, supervising and inspecting all work within their functional area. Each FAM is responsible for identifying potential or actual nonconformance(s) and recommending corrective measures as needed. FAM(s) maintain the quality of services within their AOR.

vi. **8.0 Standard Operating Procedure (SOP)** Each major functional area has a written SOP. The SOPs are an internal KBR means of ensuring provision of consistent quality performance within the LOGCAP contract. All SOPs are reviewed by KBR management to ensure commonality of controls within the LOGCAP contract. [KBR developed an Electrical Service SOP. Excerpts are below]

KBR SOP 7AA, Electrical Services, Revisions 1, 2, 3, and 4.

i. Paragraph 4.1. Electrical Maintenance Management Plan consists of the following and the goals of electrical maintenance are to:

   1. To ensure personnel safety from electrical hazards
   2. Maintain electrical installations in a safe and serviceable condition
   3. Detect minor deficiencies and perform repairs as needed

ii. Paragraph 4.1.3 Level I (one) maintenance is accomplished and performed by the operator on a daily basis to ensure early detection of deficiencies. Dept. deficiency reports and Electricians daily (or weekly, monthly, quarterly) walk-through inspections.

iii. Paragraph 4.4.1: A visual inspection of the distribution equipment shall be performed during routine equipment inspection of the corresponding facilities.

iv. Subparagraph 4.4.12: Assured grounding will be performed on a quarterly basis.

vii. **9.0: Procedures:**

A. **9.1 Audits/Inspection(s)**: The QM or designee will schedule audits and/or inspections to ensure that services, products, or task order work conforms to contractual requirement.

a. 9.1.1 Audit (Quality Assurance) - Examination of a system or process to verify the adequacy of the system or process to obtain the desired results for conformance of the service or product.

b. 9.1.2 Inspect (Quality Control) – Detailed examination of a service, product, or task order work to verify conformance to specified requirements.... This may include checks of materials, workmanship, construction, finish, and functional performance.

B. **9.4.1 Corrective Measures Implementation Plan (CMIP)** The QM or designee(s) shall request a CMIP be generated from the Functional Area Manager (FAM) or designee(s) when any of the following occur:

a. A negative (bad) trend is noted during Quality Data Analysis.

b. A nonconformance (found during audits or inspections) is Critical or Major.

c. A safety related deficiency is noted.

d. A minor nonconformance is identified and no corrective measures have been initiated by the FAM or designee(s).

e. The CMIP will be documented on the CMIP Nonconformance Log and entered into the Quality Database. The QM or designee(s) will:

i. Evaluate the CMIP to determine the adequacy of the Corrective Measures.

ii. Vali date the implementation of the CMIP until the nonconformance(s) is corrected.

iii. Conduct Follow-up evaluations to ensure satisfactory implementation of the corrective measures.

iv. Document status of Follow-up evaluations on the CMIP Nonconformance Log, the CMIP Progress Log and the Quality Database. The CMIP shall remain open until Follow-up actions are complete.

C. **9.12.4 Internal KBR Processes and Procedures** The PQM or designee shall audit internal KBR processes or procedures to verify the service or product meets the desired results for conformance of the service or product. KBR SOPs are internal processes and procedures that are audited as determined by the risk associated with the process or procedure. In areas where a Subject Matter Expert (SME) is required, the SME will assist with the internal audit.

2. **NONCONFORMANCE(S):** The preceding paragraph highlighted contract quality requirements and elements of KBR's Government accepted QCP. This paragraph documents the failures to comply with these requirements and failure to consistently execute and produce quality performance. There are two main nonconformances contained in this section: (1) Failure to Detect Systemic Nonconforming Conditions and (2) Failure to Implement Measures to Prevent Recurrence; principally a management failure. The KBR QCP outlines a process where KBR's Quality Control personnel perform audits of processes and services and identify nonconformance in the form of the CMIP. The writing of a CMIP is a demonstration of KBR's quality control processes; but it is not an indicator of quality performance, especially when the CMIP does not prevent reoccurrence of the nonconformance system wide. This statement is supported below by examples of KBR's failure to consistently implement corrective measures across the Program AOR. The failure to consistently implement corrective action that prevents reoccurrence of the discrepancy leads to rework at the Government's expense and often requires Government directed action to KBR to reduce Government risk. The Government issued 79 CARs this fiscal year (FY 08), and KBR quality inspectors issued 1,591 CMIPs (Attachment 32) during the same timeframe. Of the 1,519 CMIPs, two samples show that approximately 28% were repeat nonconformances indicating a lack of internal control and system wide corrective action. This finding, coupled with the nonconformances in Finding #1, demonstrates: (1) KBR did not maintain an acceptable quality system required by the contract and KBR's own procedures, and (2) demonstrates a failure of management to implement and ensure quality performance. As identified in the subparagraph below, indicators of failed process implementation include "spikes," or rapid increases in "self-identified" CMIPs in response to Letters of Technical Direction (LOTDs) or Corrective Action Requests (CARs). This is an indicator that the contractor's management relies on Government Quality Assurance to determine when process changes are needed. In addition, the repeated, erroneous, or incomplete entries into the KBR Service Order database have resulted in the failure of KBR to properly perform root-cause analysis. This, in turn, has created conditions that have jeopardized the Life, Health and Safety of Soldiers, Sailors, Airmen, Marines,

DoD Civilians, and Contractors in theater. Below is a description of each of the two specific contract nonconformances and evidence to demonstrate failure to meet contract requirements.

a. **Finding 2 – Nonconformance # 1: Failure to Detect Systemic Nonconforming Conditions:** KBR Failed to Detect Systemic Nonconforming Conditions IAW Paragraphs 1.14 and 8.4 of the LOGCAP SOW and the Government accepted QCP and failed to implement system wide corrective actions. This is demonstrated by the six examples below.

   i. **Example # 1: Failure to Detect and Correct Systemic Errors in STEAM:** KBR failed to detect and correct systemic failures in the Service Order Request (SOR) process as evident from analyzing data in their Strategic Tactical Enterprise Asset Management (STEAM) database. Figure 1: "Percentage of Input Errors to STEAM," shows the results of two Government audits at sites F1 and F3 on 16 Feb 2008 and two KBR audits at site C1 on 11 Apr and 23 Apr 2008.

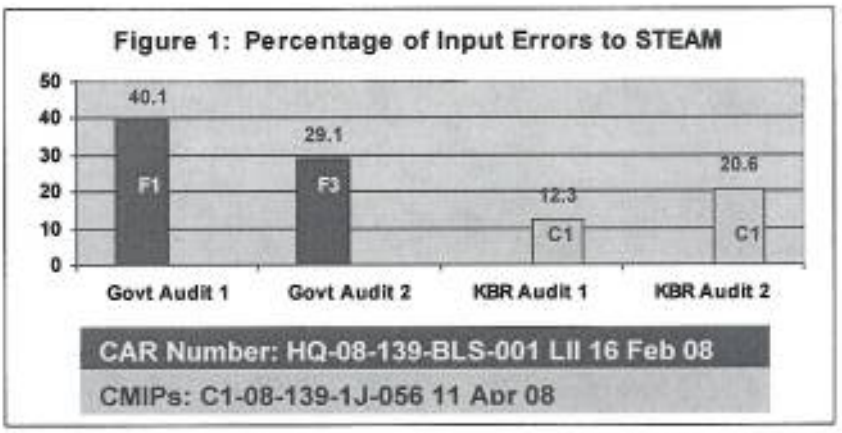


Figure 1 shows the percentage of erroneous data inputs into the STEAM system documented by Government and KBR Quality Assurance. Erroneous inputs include: Wrong work priority categorization, incorrect job start and stop times, incomplete work orders, etc

At site F1, an initial input error rate of 40.1% was recorded. A subsequent audit at F3 returned an error rate of 29.1%. With these results, the Government issued CAR HQ-08-139-BLS-001 LII. KBR Quality performed two audits at site C1 following implementation of KBR's Corrective Action plan which showed 12.33% and 20.6% error rates after the issuance of the CAR.

The Government conducted a subsequent review of SORs in the STEAM system on 30 Aug 08 utilizing a statistical double sampling plan that discovers defects of 10% or more, if they exist 90% of the time. Electrical SORs from seven sites for the period of 01 Aug 07 to 31 July 08 were sampled. Sites selected for review were: B1, B4, C5, D9, H4, AFG-3A, and T1. In order to determine which SORs to review, a random number generator was used. A total of 250 Priority 1-3 samples were reviewed with 62 defects identified. All lots sampled but one (T1) sampled failed the first pass. The second pass on T1 found 7 defects and the lot was rejected. These failures indicate this is a Program-wide nonconforming condition for electrical SORs and likely for others as well. As shown in Figure 2, "Steam Input: Defects within Random Samples," the

overall average error input rate for sites surveyed was 24.8% and mirrors previous findings by KBR at site F3 in Apr 2008.

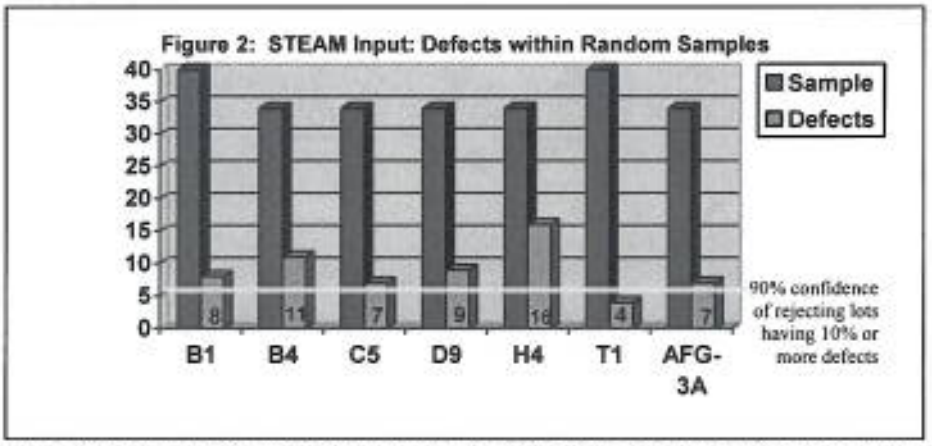


Figure 2. Steam Input: Defects within Random Samples, the overall average error input rate for all sites surveyed was 24.8% and mirrors previous findings by KBR at site F3 in Apr 2008.

This is one of six examples that demonstrate a systemic failure to detect and correct Program-wide nonconforming conditions. This example demonstrates how KBR's quality system failed to identify incomplete or inaccurate data inputs by the Service Desk operators and the trade technicians at multiple sites. Furthermore, in Fiscal Year 08, five CARs and 50 CMIPs have been written in attempts to correct this noncompliance. The data in this example indicates that management failed to identify and correct a system wide trend on a nonconforming condition.

ii. **Example # 2: Failure to Detect and Correct Systemic LHS Electrical Conditions in Facilities:** IAW FAR Part 52.246-5 and the LOGCAP contract SOW paragraphs 1.14, and 8.4, KBR is required to maintain an inspection system acceptable to the Government which includes measures for prompt detection of any condition that fails to conform to contract requirement. KBR failed to detect and correct systemic Life, Health, Safety (LHS) electrical deficiencies in the facilities they maintain under paragraph 8.1 of T.O.s 139 and 151. KBR failed to perform a services trend analysis by utilizing systems maintained by KBR. This resulted in failure to identify and recognize the trends documented below.

A. KBR maintains a database to track a variety of information to include Service Order Requests (SOR) in the Strategic Tactical Enterprise Assessment Management (STEAM) database. Government search results of KBR's SOR database resulted in the discovery that 231 electrical shock incidents occurred during the period of Sept 2006 through 31 July 2008. On average, a shock occurred once every three (3) days in Iraq in facilities maintained by KBR. The Government is unaware of any efforts undertaken by KBR to independently identify, assess, and implement corrective actions to its electrical support services or quality control/inspection program as a result of the extensive number of electrical shock incidents reported in its STEAM database.

B. Electrical shock incidents involving personnel should be classified as Life/ Health/Safety Emergency Service Request Level P1 IAW Paragraph 8.1.4.1 and Table 8.1.6 of TO 139 SOW. Of the 231 SORs generated, 92 or 40% were written incorrectly as Level P3, or routine repair, which allows for repair response time within 24 hours and repair in 14 days. By contrast, Priority 1 (P1) SORs require a two hour response time and if it cannot be repaired within two hours KBR must submit a risk mitigation plan to the Mayor's cell. This high error rate is unacceptable performance for a LHS condition.

C. The Government conducted an additional keyword search utilizing the phrase/word "burning" which produced 606 SORs during the period of Sept 2006 - 31 July 2008. (For example words associated with "burning" searched in the SOR description fields were: burning up, smell burning, smoke, fire, and sparks.) Level 1 service order priority was only assigned to 285 of 606 (47%) of the SORs generated. Additionally, greater than 90% of the 606 service order descriptions evaluated were associated with electrical issues in KBR maintained facilities.

D. These examples demonstrate that KBR failed to detect and correct the systemic LHS electrical deficiencies in the facilities they maintain despite the fact that the data was in its own system. Also the data indicates that KBR failed to detect systemic failures to conform to contract requirements for prioritizing SORs.

iii. **Example # 3: Failure to Detect and Correct Systemic LHS Fire Hazards** IAW FAR Part 52.246-5 and the LOGCAP contract SOW paragraphs 1.14, and 8.4, KBR is required to maintain an inspection system acceptable to the Government which includes measures for prompt detection of any condition that fails to conform to contract requirement. KBR failed to detect and correct systemic facility electrical deficiencies that resulted in LHS risk due to fire hazards created by faulty electrical systems. As with the examples above, KBR possessed the data to detect the systemic nonconforming conditions of their facilities as demonstrated below:

A. At the Government's request, KBR trended and provided data for the March through May 2008 fire hazard inspections conducted IAW T.O. 139 paragraph 8.19. KBR provided a *Fire and Emergency Services Deficiency Report* on 01 Jul 08 (Attachment 33) in response to this request. The report revealed that a total of 26,205 incidents of improper wiring were discovered during the fire hazard inspections. In addition to improper wiring, another 5,225 cases of errors with fuses and panel boxes, 2,285 incidents of conduit and raceway hazards, 4,571 incidents of outlet box hazards, and 3,201 incidents of hazardous switches and fuses were noted for a combined total of 41,487 electrical facility fire hazards. Across the theater, a total of 171,538 hazards were recorded in the report. Improper wiring and panel/fuse boxes account for 18.3% of the total hazards as shown in Figure 3.

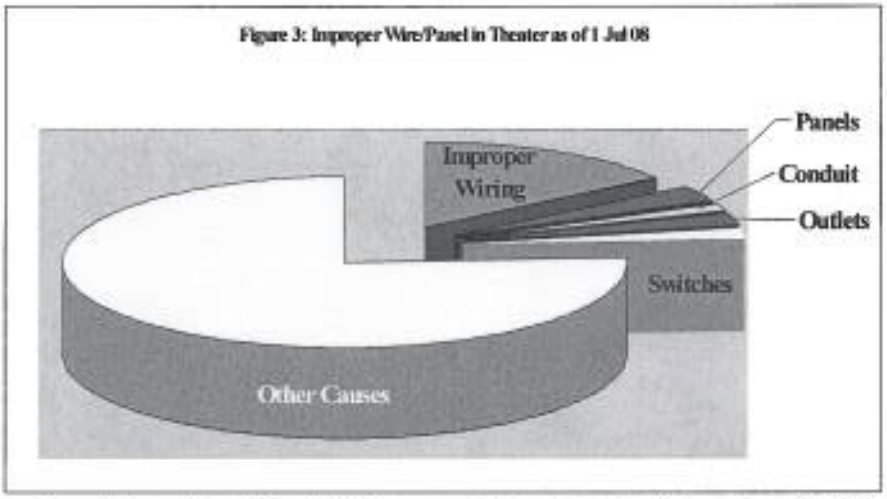


Figure 3. Data obtained from KBR's Emergency Services Deficiency Report, shows 18.3% of all incidents are related to faulty electrical wiring or electrical distribution panels. The pale grey segment of the pie is composed of 122 additional causal categories contained in the report.

B. On 27 July 2008, the Government requested fire/fire response data to identify causes of actual fires that KBR responded to in performance of the requirements of T.O. 139 paragraph 8.18. KBR provided a *Fire Response and Probable Cause Report* (Attachment 34) that detailed 2,072 fire responses from May 2007 to December 2007 and 1,466 fire responses from January 2008 to June 2008. Again, like the fire prevention inspection results showing electrical as the category of hazard with the highest risk, the number one cause of fires and fire responses were electrical issues.

C. IAW KBR QCP, Rev 5 dated 12/03/07, KBR management should have trended data from the KBR systems. Government CARs, KBR CMIPs, and trend analysis should have identified the systemic LHS facility electrical risks prompting initiation of corrective action. The Government recognizes that not all electrical hazards or fire responses reported in KBR's data systems were within KBR facilities or caused by KBR electrical services, but many were. The Government is unaware of any efforts undertaken by KBR to independently identify and assess whether its electrical support services were responsible in whole or in part for any of the thousands of reported electrical incidents, and then implement corrective actions to address systemic deficiencies in its electrical support services and quality control/inspection program.

iv. **Example # 4: Failure to Properly Detect and Systemically Correct Numerous Procedural Inconsistencies:** IAW FAR 52.246-5 and the LOGCAP contract SOW paragraphs 1.14, and 8.4, KBR is required to maintain an inspection system acceptable to the Government which includes measures for prompt detection of any condition that fails to conform to contract requirement. Furthermore, KBR developed

a Quality Control Plan based on the requirements of the LOGCAP SOW paragraph 1.14. and LOGCAP contract CDRL 003 -Technical Reports. The Government accepted this plan and its revisions. The Plan includes requirements for SOPs. Paragraph 8.0 of the QCP states, in part: "Each major functional area has a written SOP…The SOPs are an internal KBR means of ensuring provision of consistent quality performance within the LOGCAP contract. All SOPs are reviewed by KBR management to ensure commonality of controls within the LOGCAP contract [emphasis added]." The QCP has other paragraphs that demonstrate KBR's intent to maintain consistent performance across the Government (QCP paragraphs 4.0, 5.0, 6.2.3, 6.2.4, 7.0, 8.0, and 9.10). However, KBR failed to maintain commonality in its performance and its quality system failed to detect this condition. This is illustrated below by two conditions: (1) KBR failed to detect the lack of standardization of their inspection checklists and (2) this lack of standardization resulted in inconsistent performance in the areas of electrical wiring and panel inspections. These failures are illustrated below.

A. During the period of 01 Oct 2007 to 31 July 2008 DCMA conducted 227 audits of Task Order 139 SOW paragraph 8.1, Facility O&M Services. A review of these audits in August 2008 revealed that 502 defects were discovered by DCMA. Our analysis identified electrical deficiencies as causing the highest number of defects (125 defects or 24.9%). Incomplete documentation accounted for 100 (19.9%) of the total defects. During this same period (1 Oct 2007 – 31 July 2008), there were eight Level II CARs initiated with electrical service nonconformances. During the August review, an analysis of contractor inspection documents identified KBR did not have consistent /standard inspection forms. KBR utilized multiple checklists to perform inspections of the same service and checklists varied from site to site. The checklists ranged from simple or basic to detailed inspection guidelines. Not only were the checklists inconsistent, DCMA also concluded that the use of checklists that lacked detailed requirements resulted in inconsistent inspection quality as demonstrated below:

   a. **F-Sites PM Checklist** (Attachment 35) shows an example of a weekly electrical Shower\Latrine Preventive Maintenance (PM) checklist for the F Sites with non-specific inspection requirements. (This is a site specific checklist not a standardized theater checklist.) with non-specific inspection requirements. DCMA conclusion: This checklist will not produce consistent quality performance across the site or program. Column headings of Location, Panel, Outlets, Illumination, Grounding, Ohms, and Comments allow for inconsistent inspections. For example, a DCMA review of records for June 2008 noticed the Ohms column not completed with actual readings, but annotated with a check mark.

   b. **C-Sites Electrical Inspection Checklist** (Attachment 36) shows an example of a weekly electrical inspection checklist for the C Sites for Containerized Shower/Latrine units. (This is a site specific checklist not a standardized theater checklist). DCMA conclusion: Proper use of this checklist should produce consistent quality performance. This detailed checklist provides guidance to the

operator on what specifically to inspect. Electrical Panel section provides sixteen itemized characteristics to observe.

c. **F-Sites Main Distribution Panel (MDP) Checklist** (Attachment 37) shows an example of a Main Distribution panel (electrical) preventive maintenance checklist for the F Sites (This is a site specific checklist not a standardized theater checklist). DCMA conclusion: This checklist will not produce consistent quality performance across the site or program. Checklist fields have requirements to document voltage and amperage readings. However, the inspection record does not encompass requirements of KBR SOP 7AA, paragraph 4.4, rev 4, dated 14 Apr 2008.

d. **FOB Warhorse– Electrical Operations and Maintenance (O&M) Checklist** (Attachment 38) shows an example of an O&M checklist for FOB Warhorse (This is a site specific checklist not a standardized theater checklist). DCMA conclusion: This checklist will not produce consistent quality performance across the site or program. This checklist collects basic information of quarterly Preventive Maintenance (PM).

e. **C7- Warrior, Main Distribution Panel & Transfer Switch Checklist** (Attachment 39 (two documents)) shows two examples of a MDP checklist for FOB Warrior (This is a site specific checklist not a standardized theater checklist). DCMA conclusion: The second checklist, if properly used, should produce consistent quality performance across the site or program because it gives specific guidance on how to check the condition – (e.g. the definition of "Good" at the bottom of the sheet). This fact is demonstrated using the attached checklists with actual data. The first checklist contains vague inspection points such as: Conditions – Good or Bad; Grounding System – Good or Bad; and Ohm. The second checklist contains the specific guidance. (The checklist was revised after LOTD KBR-08-139X-IRAQ-1037). Using the first checklist, inspections conducted on 6 March 2008 produced zero deficiencies. Using the second checklist, inspections conducted on 8 June 2008 produced 7 deficiencies on the 19 panels inspected (37%). These were the exact same panels inspected previously that showed zero deficiencies.

B. **Conclusion**: KBR has not benchmarked inspection checklists with specific pass/fail requirements that have proven capable of accurately and consistently identifying deficiencies. KBR has also failed to share best practices for inspection checklists across the program.

C. **CAR BA-06-89-002 LII, dated 26 August 2006** (Attachment 40):

a. This CAR documents a nonconforming condition at the B-sites. There was no evidence of (1) department deficiency reports being

maintained or (2) electricians performing daily, weekly, monthly, or quarterly inspections. To quote KBR's CAR response dated 6 September 2006,KBR identified the following Root Cause: "Paragraph 3.3 {KBR SOP 7AA, Electrical Services, dated 16 August 2005} serves the purpose of defining what Level I (1) of the Electrical Maintenance Plan states. This [plan] serves as a guide when performing daily inspections of the facilities outlined in appendix F of the Task Order (TO) Statement of Work (SOW) [emphasis added]."

b. On 19 Aug 2008 during a DCMA Theater Quality Assurance Representative meeting, the KBR Quality Management representative was asked for a copy of the Electrical Maintenance Management Plan. The KBR Deputy Program Quality Manager responded that "*these were names that someone slapped in this SOP without determining what the real definitions were.*" (Attachment 41).

c. **DCMA conclusion:** The Electrical Maintenance Management Plan, if it existed, should have produced consistent performance across the program (not individual sites). However, the plan did not exist despite the fact the "Electrical Services SOP" referenced it. This is another documented instance of KBR's failing Quality system to detect systemic nonconformance

D. **Example 4 Summary**. This example indicates that KBR does not provide a consistent technical level of inspections during reoccurring facility Preventive Maintenance (PM) checks nor does KBR use standardized consistent checklists. Furthermore, inconsistent standards in their procedures promote quality escapes. The KBR Quality Control System failed to detect the systemic condition and correct the inconsistencies within electrical preventive maintenance inspections. This is evident by the fact that of the 1,519 CMIPs issued, none were in the area of Technical Inspections.

v. **Example # 5: Failure to Detect and Correct Systemic Deficient Grounding Rods**: (Attachment 42). IAW FAR Part 52.246-5 and the LOGCAP contract SOW paragraphs 1.14, and 8.4, KBR is required to maintain an inspection system acceptable to the Government which includes measures for prompt detection of any condition that fails to conform to contract requirement. During the corrective action validation of CAR Number A1-08-139-BLS-001 Level II, issued in part to request corrective action of electrical grounding cables, DCMA QARs encountered additional loose grounding wires during validation of the previously identified nonconformance. DCMA notified KBR and conducted a joint inspection of the wires with a KBR electrical team on 21 April 2008 in order to point out the deficiencies. In the process of tugging at the wires, KBR electricians discovered what appeared to be loose rods in the ground. After pulling the rods, they discovered that the rods had been severed a few feet underground from corrosion.

A. Other findings during the inspection include:

a. The electrical resistance of grounding wires was greater than 25 ohms, which is the maximum allowed value. While this is a separate issue from the corroded rods, it has the same effect of compromising the safety grounding mechanism, albeit at a different part of the circuit.

b. Numerous water pumps were observed not properly grounded.

B. KBR initiated theater wide corrective action to inspect and replace nonconforming grounding rods. However, they failed to follow their own SOP to inspect on a quarterly basis and failed to detect the systemic nonconformance that is demonstrated by the attachment until after intervention by the Government in the form of a CAR validation inspection. Nearly 10% of the grounding rods inspected to date needed corrective action. This would not have occurred if KBR's quality system had detected the nonconformance prior discovery by the Government.

vi. **Example # 6: Failure to Perform IAW the SOW Unless Directed by the Government**: IAW FAR 52.246-5 and the LOGCAP contract SOW paragraphs 1.14, and 8.4, KBR is required to maintain an inspection system acceptable to the Government which includes measures for prompt detection of any condition that fails to conform to contract requirement. Data from a sample of CMIPs indicates that over half of the time KBR detected and corrected issues only after Government direction or request in the form of Letters of Technical Direction (LOTD) and/or CARs. In response to the Government Request for Information (RFI) dated August 10, 2008, KBR provided copies of CMIPs related to electrical services issued during the period of 11 Sep 07 through 11 Aug 08 across a random sample of four bases chosen by the Government. A total of 79 CMIPs were provided in response to the RFI. Upon analysis of this sample, fifty-two percent (41 of 79) of the CMIPs were connected with direction from the Government. This indicates that KBR's inspection system is reactive, not proactive, which is not acceptable. An analysis of the sample follows and is illustrated in Figure 3.

A. September 2007 - December 2007: Three of the nine CMIPs in the sample were in direct correlation with two CARs issued during this period.

B. January 2007 - April 2008: Of the 43 CMIPs in the sample, 29 resulted from Government direction and/or request for corrective action.

a. Two CARs citing electrical nonconformance were issued in January and resulted in two CMIPs written in early February.

b. One CAR was issued in December 2007 citing Service Order Desk nonconformance and was elevated to a Theater Wide Level II CAR. This resulted in six CMIPs written between 2/27/2008 and 4/27/2008.

c. Three CARs citing power generation nonconformance were submitted to KBR and resulted in four CMIPs between Jan – Apr (and four CMIPs between May-Aug included in the count in paragraph C below).

d. One CAR citing Ablution Unit preventive maintenance nonconformance in February resulted in four CMIPs.

e. A CAR was issued on 22 February citing electrical grounding nonconformance which resulted in one CMIP. Government validation of the CAR corrective action plan conducted on 21 April revealed additional grounding conductor problems which prompted the Grounding Rod inspection cited in example 5.

f. LOTD 1037 (with Revisions) was issued during this period of Jan through Apr 08. The LOTD directed KBR to review and develop SOPs to reduce Government risk in the areas where KBR failed to detect their inconsistent process implementation across the program. The LOTD also resulted in 12 CMIPs during this period (Jan – Apr) and one CMIP in the May – Aug period included in the count in paragraph C below.

C. May 2008 - August 2008: Of 27 CMIPs written during period, nine resulted from Government direction / request for action.

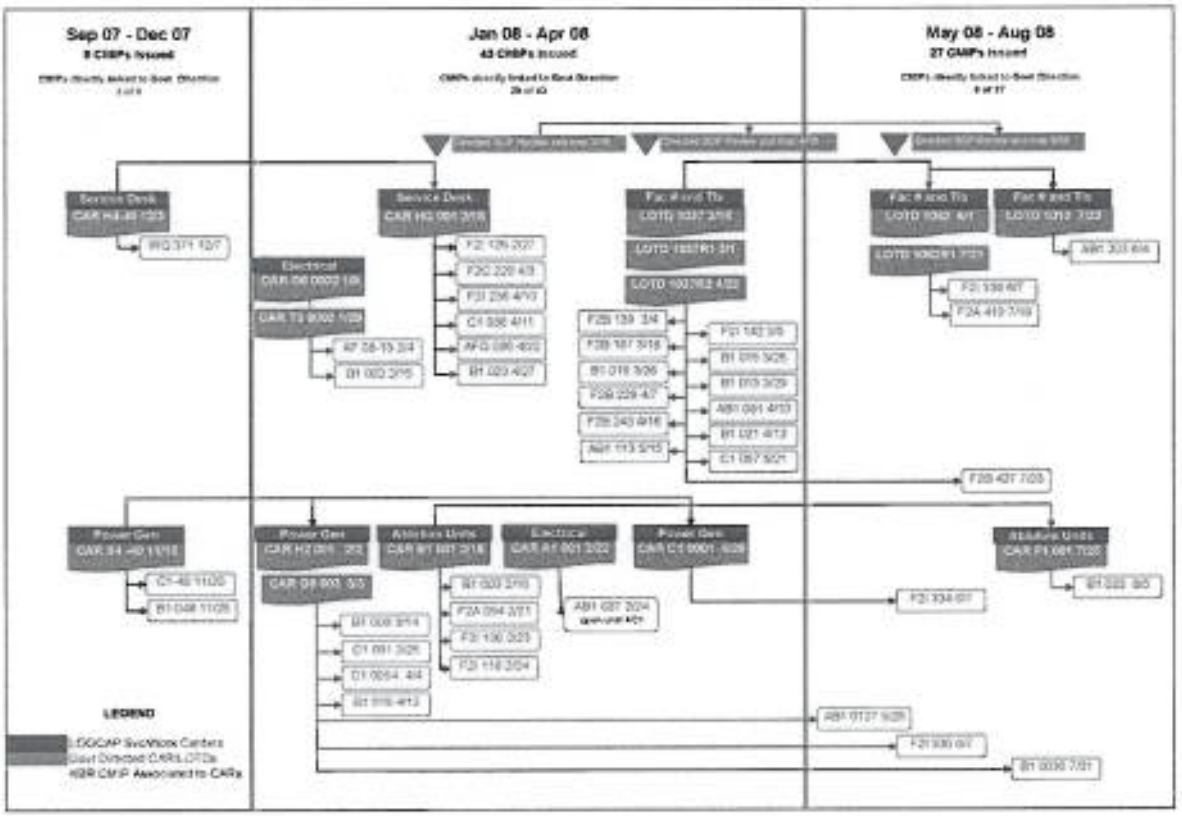
a. Four CMIPs were a result of direction via LOTDs.

b. One CAR citing preventive maintenance of Ablution Units resulted in one CMIP. Of note, this CAR identified similar deficiencies as the CAR written in Feb 2008.

c. Four additional CMIPs were generated, after the validation reviews for the power generation CARs.

D. The Government does not intend by this example to discourage the issuance of CMIPs. These corrective measures are part of KBR's internal quality process. CMIPs are used to identify and document nonconforming conditions and implement corrective actions designed, in part, to meet the contract quality requirements. However, the Government expects that KBR will maintain an inspection/quality system that routinely detects nonconformance without Government direction or request for corrective action. The Government expects that the inspection system will be proactive, not reactive. The nonconformances identified in this example should have been proactively identified by KBR, not after the Government identified the nonconformance or issued direction.

***Figure 4**: KBR failed to detect and correct systemic electrical issues that required Government direction. 41 of 79 CMIPs (52%) issued, were a result of Government directed actions. NOTE: The number of CMIPS provided is from ONLY four of 149 sites.* (Attachment 43)



b. **Finding 2 - Nonconformance # 2: Failure to Implement Measures to Prevent Recurrence.** IAW FAR 52.246-5 and the LOGCAP contract SOW paragraphs 1.14, and 8.4, and the Government accepted KBR QCP, KBR is required to maintain an inspection system acceptable to the Government which includes measures to prevent recurrence of deficiencies. The overall intent of the Government is to ensure that KBR's Quality Control System identifies and corrects deficiencies to prevent recurrence Program (system) wide and to ensure consistency throughout the performance of the LOGCAP contract. Elements of KBR's QCP state KBR's intent to implement quality systems Program wide (QCP paragraphs 4.0, 5.0, 6.2.3, 6.2.4, 7.0, 8.0, and 9.10). However, most of KBR's procedures (QCP paragraph 9.0) and evidence of KBR's actual performance fall short of this intent. A review of the QCP Procedures paragraph (9.0) reveals that the majority of the procedures are directed actions that the Quality Manager (QM) takes to execute the QCP at the Project level. Procedures at the Program/system level (executed by the Program Quality Manager (PQM) under the responsibility of the Principal Program Manager (PPM)) are few and vague. By establishing procedures primarily intended for the Project level QM, KBR fails to demonstrate it systemically implement measures to prevent recurrence of nonconformance across the Program. While there are examples where KBR has taken Program-wide corrective action, the Government has assessed that this is not a systemic practice as indicated by the facts and examples in the subparagraphs below (subparagraphs i – iv). A detailed review of KBR's

QCP, paragraph 9.4 (Corrective Measures Procedures) in paragraph i, coupled with the CMIP and CAR data in paragraphs ii and iii below, illustrates this point.

i. QCP Paragraph 9.4 addresses KBR's Corrective Measures Procedures. The procedures outlined in this paragraph are procedures implemented by the QM to issue a CMIP. To illustrate this point, experts from paragraph 9.4 and DCMA's analysis are below.

A. **KBR QCP Paragraph 9.4 Corrective Measures Procedures:**

"...The QM or designee shall review the Quality Database to identify trends related to each specific nonconformance or process. A follow-up evaluation is required to ensure satisfactory implementation of corrective measures. Results are entered into the Quality Database to close out the corrective measures action."

KBR QCP Paragraph 9.4.1 Corrective Measures Implementation Plan (CMIP):

"...The CMIP will be documented on the CMIP Nonconformance Log and entered into the Quality Database. The QM or designee(s) will:

a. Evaluate the CMIP to determine the adequacy of the Corrective Measures.

b. Validate the implementation of the CMIP until the nonconformance(s) is corrected.

c. Conduct Follow-up evaluations to ensure satisfactory implementation of the corrective measures.

d. Document status of Follow-up evaluations on the CMIP Nonconformance Log, the CMIP Progress Log and the Quality Database. The CMIP shall remain open until Follow-up actions are complete."

B. DCMA Analysis:

a. There is no specific documented procedural requirement to determine if the nonconforming condition exists across the Program or if it is isolated to a base, or Project. The procedure does identify trending requirements and lacks the process description to ensure trending across the Program. The procedure says the QM conducts the trending but the QM is responsible for the Project quality, not the Program quality. Therefore, the lack of specific procedures for Program trending introduces risk that this will not be conducted.

b. The procedure lacks a documented process for the QM to notify the PQM if trending identifies systemic nonconforming conditions across the Program.

c. The procedure lacks a documented process to determine if Program level corrective action is necessary and program level follow-up evaluations are necessary. This is especially critical if the CMIP identifies procedural nonconformance since procedures should be consistent across the Program and would require Program corrective action.

d. KBR QCP paragraph 9.4.1 lacks a documented process for implementing Program level CMIPs issued by the PQM. Upon inquiry to the PQM and Deputy PQM on 30 August 2008, they stated the KBR had only issued two or three Program wide CMIPs. This is another indicator that KBR's current quality processes are targeted at the Project level rather than the Program level; and this is despite the indication of Program level nonconforming conditions indicated by KBR's own data outlined below in paragraph ii.

e. KBR's QCP fails to adequately document a process to use CMIPs to update their processes / SOPs, thus creating a closed loop quality system.

f. KBR QCP Paragraph 9.0's documented procedures for the PQM are few and vague compared to those outlined for the Quality Manager.

g. KBR's QCP lacks any documented procedure to identify if Government identified nonconforming conditions are prevalent in other areas of the program and implement Program wide corrective measures required by Government CARs (reference the CAR form, paragraph 8.D.)

h. The procedural gaps outlined above coupled with the CMIP and CAR data in paragraphs ii and iii lead the Government to conclude that Program wide corrective action to prevent recurrence of nonconformance is not a systemic practice.

ii. **Example #1 CMIPs**: CMIPs are a quality procedure KBR quality managers use to identify and request corrective action from the management responsible for the service. CMIPs are not necessarily a demonstration of quality performance, especially if the nonconformance is not corrected and recurrence is not prevented. Correction and prevention is a management responsibility. The CMIPs and CARs in the paragraphs below demonstrate repeat findings. This indicates KBR management failed to consistently correct and prevent systemic recurrences of quality discrepancies across the Program. It also indicates that the management review process identified in KBR's QCP paragraph 9.4 is inconsistent or ineffective (QCP quote: "The data collected shall be used to conduct management review to assess the suitability and effectiveness of the management system in meeting the client and the company's needs and expectations.")

A. In response to the Government Request for Information (RFI) dated August 10, 2008, KBR provided copies of CMIPs related to electrical services issued during the period of 11 Sep 07 through 11 Aug 08 across a random sample of four bases chosen by the Government (C1, B1, F2, and AB1). A total of 79 CMIPs were provided in response to the RFI (5% of the total CMIP population). In this limited sample of 79 CMIPs, DCMA identified repeat deficiencies in 22 CMIPs (28%) involving the four areas listed below.

   a. Five Ground Fault Circuit Interrupter (GFCI) [Actual practice, Residual Current Device (RCD) are used, not GFCI] Nonconformance Recurrences (Attachment 44).

   b. Eight Bonding /Grounding /Distribution Panel Nonconformance Recurrences (Attachment 45).

   c. Six Service Order Desk Nonconformance Recurrences (Attachment 46).

   d. Three Construction & Facilities Maintenance Nonconformance Recurrences (Attachment 47).

B. DCMA conducted further analysis after identifying trends of failure to prevent reoccurrence of nonconformance in the limited sample. On or about (O/A) 24 August 2008 DCMA received information it had requested from KBR identifying the total number of CMIPs issued in fiscal year (FY) 2008, broken out by categories of service or work centers. KBR provided a list documenting 1591 CMIPs issued across the Program during FY 08. DCMA requested, and KBR provided copies of 851 CMIPs. Of the 851, DCMA chose 811 CMIPs (50% of total CMIP population) to analyze for trends of repeat deficiencies (reoccurrence of the same nonconforming condition at the same or different site/base). The following results were obtained from the analysis (see charts below on the following page):

   a. Electric Related CMIPs (Figure 5):
      i. 376 CMIPs reviewed.
      ii. 267 repeat CMIPs discovered (71% of 376).

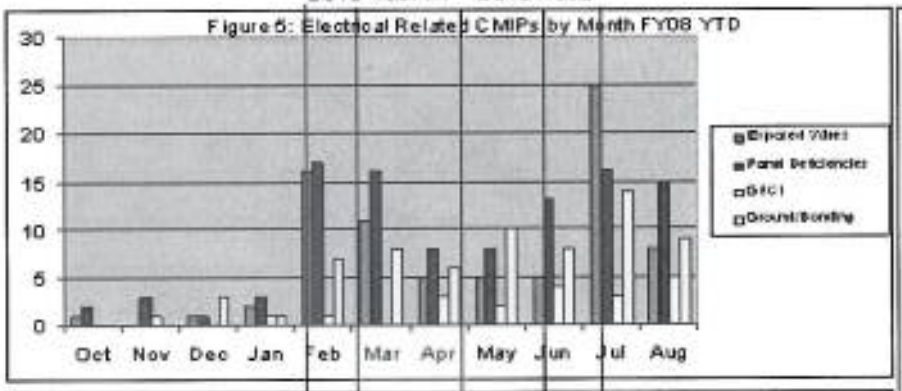
   b. O&M and Facilities Maintenance CMIPs (Figure 6):
      i. 145 CMIPs reviewed.
      ii. 59 repeat CMIPs discovered (41% of 145).

   c. Safety (Figure 7):
      i. 147 CMIPs reviewed.
      ii. 74 repeat CMIPs discovered (50% of 147).

   d. Power Generation (Figure 8):
      i. 143 CMIPs reviewed.
      ii. 64 repeat CMIPs discovered (45% of 143).

   e. Total repeat CMIPs: 464 or 29% of the total CMIP population. This is consistent with the repeat CMIP findings in the first sample.

LOTD 1037 LOTD 1037R2 LOTD 1062R1
LOTD 1037R1 LOTD 1062

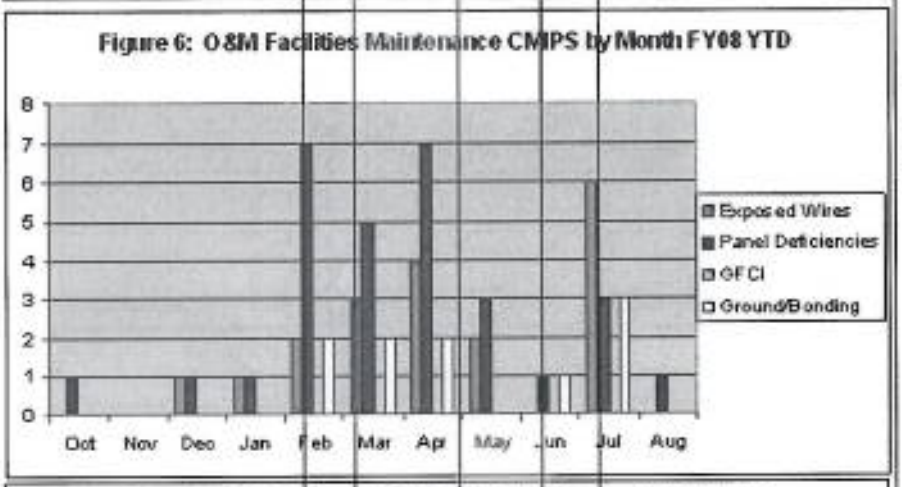


Electric Related CMIPs

376 CMIPs Reviewed

267 repeat (71% of 376)

16.78% of all CMIPS (17% of 1591)

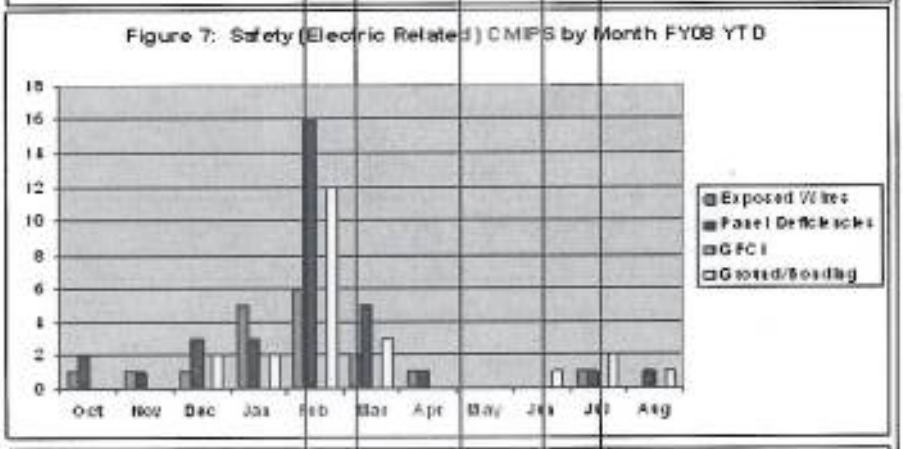


O/M and Fac Maintenance

145 CMIPs Reviewed

59 repeat (40.7% of 145)

3.7% of all CMIPs (3.7% of 1591)

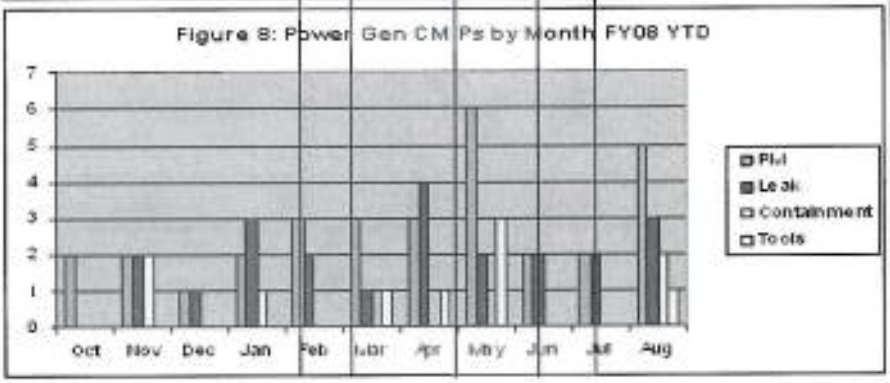


Safety

147 CMIPS Reviewed

74 repeat (50.3% of 147)

4.7% of all CMIPs (4.7% of 1591)



Power Gen

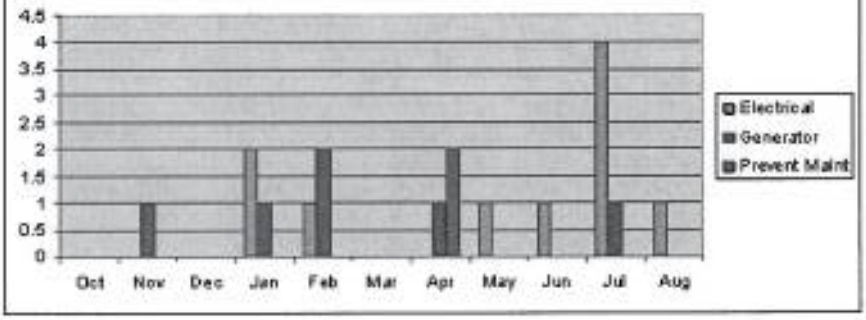
143 CMIPs Reviewed

64 repeat (44.8% of 143)

4.0% of all CMIPs (4.0% of 1591)

iii. **Example # 2 CARs:** An analysis of CARs also demonstrates repeat findings and indicates that KBR does not consistently execute systemic corrective action to prevent recurrence across the LOGCAP Program. Of the 79 CARs DCMA issued this FY, 18 (23%) were repeat findings (Attachment 48). Of note, most are related to electrical services.

Figure 9: Repeat CAR by Month for FY08 YTD



Repeat Government CARs

79 CARs Reviewed

18 Repeat – 23 % of All CARs

iv. The preceding two examples show that while KBR QA personnel documented the deficiencies and ultimately closed the CMIP(s), repeat occurrences of the same or similar discrepancies occurred across the Program. This indicates a lack of management involvement in the tracking, trending, and long-term resolution of LHS issues identified by KBR's Quality Assurance / Quality Control (QA/QC) personnel. This is substantiated by the fact that analysis of two samples of CMIP data revealed that repeat findings accounted for approximately 28% of all CMIPs, while CAR repeat findings were 23%. A further indicator of this condition is shown through analysis of KBR's QCP and how most procedures are established for QMs at the Project level without specific documented procedures to ensure systemic conditions are detected and corrected across the Program. The graphs above indicate KBR's management failed to act to prevent systemic recurrence of nonconforming conditions. Issuance of a CMIP demonstrates part of a quality process; it does not demonstrate overall quality performance.

v. As demonstrated by the CMIP and CAR data above, evidence existed to indicate the systemic nonconforming condition of the facility electrical systems in KBR maintained facilities. KBR's failure to maintain an inspection system to prevent reoccurrence at the Program level permitted hazardous electrical conditions to continue Program wide.

c. **Summary:** Finding #2 outlined the contract requirements for quality and quality control, as well as KBR's Government accepted QCP and two nonconformances, with several examples of failure to systemically implement these requirements. There are three basic quality contract requirements: (1) maintain a system that detects nonconformances, (2) corrects the nonconformances, and (3) prevents recurrence. The overall intent of the Government is to ensure that KBR's Quality Control System identifies and systematically corrects deficiencies to ensure consistency throughout the LOGCAP contract. The nonconformances above demonstrated that KBR failed to systematically detect, correct, or prevent recurrence of LHS

deficiencies and conditions. The nonconformances in this finding further supports the determination that KBR's quality system is in serious noncompliance with FAR 52.246-5 and the LOGCAP contract SOW quality requirements.

The facts also demonstrate that KBR is reactive, not proactive in identifying and correcting deficient performance. Issuance of CMIPs is not evidence of quality performance, especially when KBR management fails to implement corrective actions across the Program (as demonstrated in Finding 2 – Nonconformance #2 and as intended by KBR's own QCP.) This is further validated by the fact that 1,591 CMIPs were issued in Fiscal Year 2008, with evidence that 28% were repeat deficiencies. Finding #2 – Nonconformance # 1 demonstrates KBR's failure to identify and correct systemic deficiencies. KBR failed to both use and trend the data maintained in its own systems, resulting in LHS conditions throughout the Theater -- as demonstrated by Coalition personnel receiving electrical shocks on average of once every three days. KBR does not maintain every facility on a site and not all electrical hazards are under KBR's control. Yet KBR had the data available in its Service Order, Fire Fighting, and Fire Hazards Inspection records to identify the facilities they do maintain, and the electrical conditions they can control. KBR also had evidence of these conditions through its own CMIPs and DCMA's CARs. The failure to maintain and execute the three basic tenants of a quality system -- (1) maintain a system that detects nonconformance, (2) corrects the nonconformance, and (3) prevents recurrence -- is unacceptable.