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| PANAMA CANAL AUTHORITY | VARIATION | PAGE 1 OF 6 |
| 1. REQUEST FOR PROPOSAL No.: RFP-76161 | 2. CONTRACT No.: CMC-221427 | 3. DATE: December 28, 2012 |
| | | 4. VARIATION No.: 57 |

5. ISSUED BY:

PANAMA CANAL AUTHORITY
Employer's Representative
Locks Project Management Division
Building 740, Corozal
Panama, Republic of Panama

| | |
|---|---|
| 6. NAME AND ADDRESS OF CONTRACTOR (INCLUDE PHYSICAL & POSTAL ADDRESS) Grupo Unidos por el Canal, S.A. Building 22B, Brujas Road Cocoli, Republic of Panama | 7. CONTRACTOR'S TELEPHONE NUMBER: 507-316-9900 |
| | 8. CONTRACTOR'S FACSIMILE NUMBER: |

9. VARIATION:

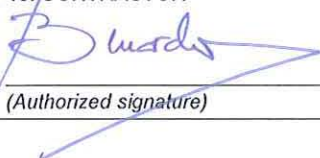

- ☒ The contract referred to in item No. 2 is hereby varied as set forth in item 10, entitled "DESCRIPTION OF VARIATION".
☒ YES. ☐ NO. The contractor shall send a copy, duly signed, of this Variation to the Employer's Representative/Contracting Officer.

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|---|--|
| | 9 A. THIS VARIATION IS EXECUTED ON THE BASIS OF: <i>(Specify the legal authority).</i> THE VARIATION DESCRIBED IN ITEM 10 IS HEREBY INCORPORATED AND MADE A PART OF THE CONTRACT. |
| | 9 B. THE CONTRACT REFERRED TO IN ITEM NO. 2, IS VARIED TO INCORPORATE ADMINISTRATIVE CHANGES (such as the paying office, account numbers, etc.). |
| X | 9 C. THIS BILATERAL AGREEMENT IS SIGNED AND INCORPORATED INTO THE CONTRACT REFERRED TO IN ITEM NO. 2 OF THIS FORM, ON THE BASIS OF: <i>(Specify the legal authority)</i> Volume III, Conditions of Contract, Sub-Clause 1.16 [Entire Agreement], 4 th Paragraph |
| | 9 D. OTHER. <i>(Specify manner and the legal authority).</i> |
| | 9 E. ACCOUNT NUMBER <i>(If required):</i> |

10. DESCRIPTION OF THE VARIATION *(List in accordance with the order of the Contract. If additional space is required, use blank sheets).*

See attached

Except for the variation(s) herein specified, all other terms and conditions of the Contract remain unchanged.

| | |
|---|---|
| 11. NAME AND TITLE OF THE PERSON AUTHORIZED TO SIGN <i>(Type or print)</i> Bernardo Gonzalez Contractor's Representative | 12. NAME AND TITLE OF THE EMPLOYER'S REPRESENTATIVE/CONTRACTING OFFICER <i>(Type or print)</i> Cheryl P. George, Employer's Representative Delegee |
| 13. CONTRACTOR  (Authorized signature) | 14. DATE: 28/12/2012 |
| | 15. PANAMA CANAL AUTHORITY  (Employer's Representative/Contracting Officer's signature) |
| | 16. DATE: 28/12/2012 |

Variation No. 57 is issued to incorporate the following:

1. **Volume II, Part 2, Section 01 81 36.13 [O&M Buildings and Facilities –Space –**
Delete the text of Paragraph 1.03.A.3 which currently reads as follows:

| | | | |
|--|--------|--|--|
| | Access | Independent access to the control room | Provide one main entrance, stairs and elevator, and an emergency exit with stairs, in accordance with Section 28 13 00 (Access Control Systems) and Section 01 86 13 (Plant — Mechanical Systems and Equipment). |
|--|--------|--|--|

And replace it with the following text:

| | | | |
|--|--------|--|---|
| | Access | Independent access to the control room | Provide one main entrance, elevator, and an emergency exit with at least one set of stairs, in accordance with Section 28 13 00 (Access Control Systems) and Section 01 86 13 (Plant — Mechanical Systems and Equipment). |
|--|--------|--|---|

(RFV-132)

2. **Volume II, Part 2, Section 26 33 00 [Direct Current Equipment]** - Delete Paragraph 1.01 A.2.d, entirely and replace it with the following:

"d. +125 to +48, +125 to +24, and +125 to +12 volt DC-DC Converters for local control power used by process control systems and other CCSS systems."

(RFV-146-RFI-474)

3. **Volume II, Part 2, Section 26 33 00 [Direct Current Equipment]** - Delete Paragraph 1.03 A.3.a, entirely and replace it with the following:

"a. +125 VDC systems shall be used for delivering power to the loads from the closest +125 VDC distributed system location. At remote locations, this power shall be converted into nominal +12, +24, or +48 VDC, as required."

(RFV-146-RFI-474)

4. **Volume II, Part 2, Section 26 33 00 [Direct Current Equipment]** - Delete Paragraph 1.03 A.8.c, entirely and replace it with the following:

"c. +24 VDC Systems: Shall be isolated from ground, unless grounded negative is recommended by the system integrator, designer, or manufacturer."

(RFV-146-RFI-474)

5. **Volume II, Part 2, Section 26 33 00 [Direct Current Equipment]** - Add Paragraphs 1.03 A.8.e and f, as follows:

"e. +12 VDC Systems: Shall be isolated from ground, unless grounded negative is recommended by the system integrator, designer, or manufacturer."

f. +48VDC Systems: Shall be isolated from ground, unless grounded negative

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is recommended by the system integrator, designer, or manufacturer."

(RFV-146-RFI-474)

6. **Volume II, Part 2, Section 26 33 00 [Direct Current Equipment]** - Delete Paragraph 1.03 C.11.a, entirely and replace it with the following:

"a. Units inside PCS cabinets shall include a status relay contact, monitoring the +24 VDC output. If available, units shall include condition monitoring of analog output for temperature, output current, and output voltage. These outputs shall be wired to the room's I/O Concentrator, and viewed on the MDS HMI."

(RFV-146-RFI-474)

7. **Volume II, Part 2, Section 26 33 00 [Direct Current Equipment]** – Table 26 33 00-4 which currently specifies converter characteristics as follows:

| Table 26 33 00-4: ^{A8} DC-DC Converter Characteristics ^{A8} | | |
|---|----------------------|---|
| Input Voltage | Nominal | +125 VDC |
| | Range | Variable between 35 and 140 VDC |
| Conversion | Efficiency | 90% |
| Output | Power Rating (Watts) | As required for PLCs, MCCs, switchgear, and all other +24 VDC loads |
| | Protection | Overload, overvoltage, and short circuit. |
| | Regulation | ±1% line and load |
| | Voltage | +24 VDC nominal |

shall be deleted and replaced with:

| Table 26 33 00-4: DC-DC Converter Characteristics | | | | |
|---|----------------------|---|---|-----------------------------------|
| | | 125-to-48 DC-DC Converters | 125-to-24 DC-DC Converters | 125-to-12 DC-DC Converters |
| Input Voltage | Nominal | +125 VDC | | |
| | Range | Variable between 110 and 140 VDC | | |
| Conversion | Efficiency | 90% | 90% | 85% |
| Output | Power Rating (Watts) | As required for +48 VDC loads | As required for PLCs, MCCs, switchgear, and all other +24 VDC loads | As required for all +12 VDC loads |
| | Protection | Overload, overvoltage, and short circuit. | | |
| | Regulation | ±1% line and load | ±1% line and load | ±1.5% line and load |
| | Voltage | +48 VDC nominal | +24 VDC nominal | +12 VDC nominal |

(RFV-146-RFI-474)

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8. **Volume II, Part 2, Section 26 43 13 [Transient Voltage Surge Suppressors]** - Delete Paragraph 1.03 C.5.a.5), entirely and replace it with the following:

"5) *Equipment shall be based on thermally protected Metal Oxide Varistor (MOV) technology, and shall be tested in accordance to UL 1449 or IEC equivalent. Equipment shall include an internal thermal fuse in its design.*" (RFV-130)

9. **Volume II, Part 2, Section 26 43 13 [Transient Voltage Surge Suppressors]** - Delete Paragraph 1.03 C.5.a.7), entirely and replace it with the following:

"7) *Equipment shall be integrated with the electrical distribution equipment and shall include surge counter which displays the combined total number of transient voltage surges detected.*" (RFV-130)

10. **Volume II, Part 2, Section 26 43 13 [Transient Voltage Surge Suppressors]** - The Line Item in Table 26 43 13-2 which specifies enclosure for AC distribution panels TVSSs as follows:

| | |
|-----------|----------------------------|
| Enclosure | NEMA 4 or 4X, non-metallic |
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Shall be deleted and replaced with the following:

| | |
|-----------|----------------------------------|
| Enclosure | Mounting within electrical panel |
|-----------|----------------------------------|

(RFV-130)

11. **Volume II, Part 2, Section 28 16 00 [Intrusion Detection Systems]** - Delete Paragraph 1.03 C.9.a, entirely and replace it with the following:

"a. *Units shall be of the dual microwave/passive infrared (MW/PIR) technology type with independent circuit supervision, and shall switch automatically to single PIR technology in case of losing microwave detection signal.*" (RFV-155)

12. **Volume II, Part 2, Section 28 16 00 [Intrusion Detection Systems]** - Delete Paragraph 1.03 C.9.d, entirely and replace it with the following:

"d. *Motion detectors shall work in a detection pattern as required for the application: Barrier, circular (360°), or wide angle.*" (RFV-155)

13. **Volume II, Part 2, Section 28 16 46 [Vehicular Control Systems]** - Delete Paragraph 1.03 D.6.b entirely and replace it with the following:

"b. *Each RB shall be installed behind a RAB onto the road surface as close as possible to the RAB and as required to avoid false detection by its magnetic loop, preferably without pit or special infrastructure. Concrete slopes before and after obstacle shall be constructed as part of this Contract.*" (RFV-149)

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14. **Volume II, Part 2, Section 28 23 00 [Closed Circuit Video Systems]-** Delete Paragraph 1.03 A.1.f, in its entirety and replace it with the following:

"f. All CCVS users shall be dynamically programmed and partitioned to view and control video signals from specific camera groups. Also, such users shall be able to view video signals from everyone else's CCVS system cameras except as indicated in Paragraphs 1.04.A.2.b and 1.04.A.2.c. Users shall be inhibited from controlling units outside their area of responsibility."
(Letter No. IAE-UPC-1247)

15. **Volume II, Part 2, Section 28 23 00 [Closed Circuit Video Systems]-** Add new Paragraphs 1.04 A.2.b and c, as follows:

"b. OPP cameras and their recordings shall not be viewable nor controllable by non-OPP users, including internet, OPE, and OPT users."

c. Internet users shall only be able to view and control designated web cameras."
(Letter No. IAE-UPC-1247)

16. **Volume II, Part 2, Section 28 31 00 [Fire Alarm Systems for Buildings]-** Delete Paragraph 1.04.C.1, in its entirety and replace it with the following:


"1. Each initiating device shall be programmed to display at the Fire Alarm Panel, upon alarm activation, the name of the room, and for buildings with more than one level, the identification of the floor on which it is located. Additional annotation shall be included to display if there are smoke detectors located under floor and inside roof attics."
(RFI-435)

17. **Volume II, Part 2, Section 40 91 00 [Primary Process Measurement Devices]-** Delete Paragraph 1.03 B.20.a, in its entirety and replace it with the following:

"a. High performance rugged wind sensors shall be provided to measure wind speed and direction, providing two 4-20 mA outputs (one for wind speed and one for wind direction). Units shall be provided with a corrosion resistant construction, avoiding use of slip rings and brushes for increased reliability/availability. Wind speed sensors shall be a wind vane and a multiple blade helicoid propeller with a full scale of 100 m/s."
(RFV-158)

18. **Volume II, Part 3, Section 01 35 23 [Health and Safety Requirements] -** Delete Paragraph 1.05 H entirely and replace it with the following:

*"H. **Work in High Places:** The Contractor shall enforce the use of the fall protection devices for each activity all times when Contractor's Personnel are on surfaces 1,800 mm (6 feet) or more above lower levels. Personal fall-arrest systems are required when working on scaffolds above 1.8 meters (6 feet), from an articulating or extendible boom, scissor lifts, swing stages, or suspended platform. Fall protection shall comply with ACP 2600SEG-109."*



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Safety nets shall be provided in unguarded workplaces over machinery and dangerous operations. They shall also be used for work on surfaces that are elevated above 7.5 meters (25 feet), unless another suitable fall protection system is implemented." (RFV-159)

There is no time or cost impact to the Locks Contract as a consequence of this Variation.





December 28, 2012

DCN: IAE-UPC-1362

Mr. Bernardo Gonzalez
Grupo Unidos por el Canal, S.A.
Building 22B, Brujas Road
Cocoli, Republic of Panama


Reference: Contract No. CMC-221427, Design and Construction of the Third Set of Locks,
Panama Canal

Subject: Variation No. 057

Dear Mr. Gonzalez:

Enclosed is Variation No. 057 to the above referenced contract. Please sign Item 13 and complete Item 14 (Date Signed) on the Variation form enclosed and return it promptly to Ms. Tere Abadia, Contract Specialist.

Sincerely yours,


Cheryl P. George
Employer's Representative Delegee
Locks Project Management Division

c.
Joe Cazares/IAE
Tere Abadia/IAE