

|                                                                                                   |                                                                                                                                                                                       |           |            |         |      |          |       |      |                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------|---------|------|----------|-------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br><b>NISOC</b> | نگهداشت و افزایش تولید میدان نفتی بینک<br>سطح الارض و ابنیه تحت الارض/ بسته ایستگاه تقویت فشار گاز<br>خرید پکیج های کمپرسور گاز (رقت و برگشتی) بینک<br>(قرارداد BK-HD-GCS-CO-0008_03) |           |            |         |      |          |       |      |  <br><b>HAVAYAR</b><br>INDUSTRIAL GROUP |
|                                                                                                   | CAUSE & EFFECT CHARTS LIST                                                                                                                                                            |           |            |         |      |          |       |      |                                                                                                                                                                                                               |
| شماره پیمان:                                                                                      | پروژه                                                                                                                                                                                 | بسته کاری | صادر کننده | تسهیلات | رشته | نوع مدرک | سریال | نسخه | شماره صفحه: 1 از 14                                                                                                                                                                                           |
| ۰۵۳ - ۰۷۳ - ۹۱۸۴                                                                                  | BK                                                                                                                                                                                    | GCS       | HY         | 120     | IN   | LI       | 0001  | V03  |                                                                                                                                                                                                               |

## طرح نگهداشت و افزایش تولید ۲۷ مخزن

## CAUSE & EFFECT CHARTS LIST

## نگهداشت و افزایش تولید میدان نفتی بینک

| V03  | JUL.2024 | IFR                       | Havayar Co.  | M. Fakharian | M. Sadeghian    |                 |
|------|----------|---------------------------|--------------|--------------|-----------------|-----------------|
| V02  | MAY.2024 | IFR                       | Havayar Co.  | M. Fakharian | S. Faramarzpour |                 |
| V01  | SEP.2023 | IFR                       | Havayar Co.  | M. Fakharian | S. Faramarzpour |                 |
| V00  | JUN.2023 | IFR                       | Havayar Co.  | M. Fakharian | A. M. Mohseni   |                 |
| Rev. | Date     | Purpose of Issue / Status | Prepared by: | Checked by:  | Approved by:    | CLIENT Approval |
|      |          | CLIENT Doc. Number:       |              |              |                 |                 |

Status:

IFA: Issued for Approval  
IFR: Issued for Review  
IFI: Issued for Information  
AFC: Approved for Construction

|                                                                                                   |                                                                                                                                                                                              |                  |                  |                |            |                |               |                                                                                     |                     |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|----------------|------------|----------------|---------------|-------------------------------------------------------------------------------------|---------------------|
| <br><b>NISOC</b> | <p>نگهداشت و افزایش تولید میدان نفتی بینک<br/> سطح الارض و ابنیه تحت الارض ایستگاه تقویت فشار گاز<br/> خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک<br/> (قرارداد BK-HD-GCS-CO-0008_03)</p> |                  |                  |                |            |                |               |  |                     |
|                                                                                                   | CAUSE & EFFECT CHARTS LIST                                                                                                                                                                   |                  |                  |                |            |                |               |                                                                                     |                     |
| شماره پیمان:<br>۰۵۳ - ۰۷۳ - ۹۱۸۶                                                                  | پروژه<br>BK                                                                                                                                                                                  | بسته کاری<br>GCS | صادر کننده<br>HY | تسهیلات<br>120 | رشته<br>IN | نوع مدرک<br>LI | سریال<br>0001 | نسخه<br>V03                                                                         | شماره صفحه: 2 از 14 |

REVISION RECORD SHEET

| Page | V00 | V01 | V02 | V03 | V04 | V05 | V06 | Page | V00 | V01 | V02 | V03 | V04 | V05 | V06 |
|------|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|
| 1    | X   | X   | X   | X   |     |     |     | 40   |     |     |     |     |     |     |     |
| 2    | X   | X   | X   | X   |     |     |     | 41   |     |     |     |     |     |     |     |
| 3    | X   | X   | X   | X   |     |     |     | 42   |     |     |     |     |     |     |     |
| 4    | X   | X   | X   | X   |     |     |     | 43   |     |     |     |     |     |     |     |
| 5    |     | X   | X   | X   |     |     |     | 44   |     |     |     |     |     |     |     |
| 6    |     |     | X   | X   |     |     |     | 45   |     |     |     |     |     |     |     |
| 7    |     |     | X   | X   |     |     |     | 46   |     |     |     |     |     |     |     |
| 8    |     |     | X   | X   |     |     |     | 47   |     |     |     |     |     |     |     |
| 9    |     |     | X   | X   |     |     |     | 48   |     |     |     |     |     |     |     |
| 10   |     |     | X   | X   |     |     |     | 49   |     |     |     |     |     |     |     |
| 11   |     |     | X   | X   |     |     |     | 50   |     |     |     |     |     |     |     |
| 12   |     |     | X   | X   |     |     |     | 51   |     |     |     |     |     |     |     |
| 13   |     |     | X   | X   |     |     |     | 52   |     |     |     |     |     |     |     |
| 14   |     |     | X   | X   |     |     |     | 53   |     |     |     |     |     |     |     |
| 15   |     |     |     |     |     |     |     | 54   |     |     |     |     |     |     |     |
| 16   |     |     |     |     |     |     |     | 55   |     |     |     |     |     |     |     |
| 17   |     |     |     |     |     |     |     | 56   |     |     |     |     |     |     |     |
| 18   |     |     |     |     |     |     |     | 57   |     |     |     |     |     |     |     |
| 19   |     |     |     |     |     |     |     | 58   |     |     |     |     |     |     |     |
| 20   |     |     |     |     |     |     |     | 59   |     |     |     |     |     |     |     |
| 21   |     |     |     |     |     |     |     | 60   |     |     |     |     |     |     |     |
| 22   |     |     |     |     |     |     |     | 61   |     |     |     |     |     |     |     |
| 23   |     |     |     |     |     |     |     | 62   |     |     |     |     |     |     |     |
| 24   |     |     |     |     |     |     |     | 63   |     |     |     |     |     |     |     |
| 25   |     |     |     |     |     |     |     | 64   |     |     |     |     |     |     |     |
| 26   |     |     |     |     |     |     |     | 65   |     |     |     |     |     |     |     |
| 27   |     |     |     |     |     |     |     | 66   |     |     |     |     |     |     |     |
| 28   |     |     |     |     |     |     |     | 67   |     |     |     |     |     |     |     |
| 29   |     |     |     |     |     |     |     | 68   |     |     |     |     |     |     |     |
| 30   |     |     |     |     |     |     |     | 69   |     |     |     |     |     |     |     |
| 31   |     |     |     |     |     |     |     | 70   |     |     |     |     |     |     |     |
| 32   |     |     |     |     |     |     |     | 71   |     |     |     |     |     |     |     |
| 33   |     |     |     |     |     |     |     | 72   |     |     |     |     |     |     |     |
| 34   |     |     |     |     |     |     |     | 73   |     |     |     |     |     |     |     |
| 35   |     |     |     |     |     |     |     | 74   |     |     |     |     |     |     |     |
| 36   |     |     |     |     |     |     |     | 75   |     |     |     |     |     |     |     |
| 37   |     |     |     |     |     |     |     | 76   |     |     |     |     |     |     |     |
| 38   |     |     |     |     |     |     |     | 77   |     |     |     |     |     |     |     |
| 39   |     |     |     |     |     |     |     | 78   |     |     |     |     |     |     |     |



053 - 073 - 9184

تگه‌داشت و افزایش تولید میدان نفتی بینک  
سطح الارض و ابنیه تحت الارض بسته ایستگاه تقویت فشار گاز  
خرید پکیج های کمپرسور گاز (دفت و برگشتی) بینک  
(قرارداد BK-HD-GCS-CO-0008 03)



شماره صفحه: 3 از 14

## CAUSE AND EFFECT CHARTS LIST

GCS

|  |  |
|--|--|
|  |  |
|--|--|

20

IN

[illegible]

0001

شماره صفحه: 3 از 14

## START AND SHUTDOWN OF COMPRESSOR A

## EFFECTS

## CAUSE

| TITLE |
|-------|
|-------|

SOUR GAS RECIPROCATING COMPRESSOR

C-2101 / C-2102

[illegible]

LEGEND:  
LCP: LOCAL CONTROL PANEL  
UCP: UNIT CONTROL PANEL  
MCC: MOTOR CONTROL CENTER  
E: ENERGIZE  
DE: DE-ENERGIZE

NOTE 1: THE START PERMISSIVE REQUEST FROM UCP TO DCS, START PERMISSION OF UCP, AND START SEQUENCE (AUTOMATICALLY) SHALL BE CONSIDERED WHEN THE COMPRESSOR START IS FROM UCP.  
NOTE 2: DURING THE COMPRESSOR STOP, WILL BE STOPPED WITH DELAY TIME.  
NOTE 3: BEFORE STARTING THE COMPRESSOR FROM LCP, PREHEATING AND PRELUBRICATION STEPS (DISCUSSED IN CONTROL PHILOSOPHY "BK-GCS-HY-120-PR-PH-0001") SHALL BE DONE BY OPERATOR VIA LCP.

|                                                                                                  |                                                                                                                                                                                                                          |       |      |            |         |      |          |       |                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|------------|---------|------|----------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br><b>NISOC</b> | <div>نگهداشت و افزایش تولید میدان نفتی بینک</div> <div>سطح الارض و ابنیه تحت الارض/ بسته ایستگاه تقویت فشار گاز</div> <div>خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک</div> <div>(قرارداد BK-HD-GCS-CO-0008_03)</div> |       |      |            |         |      |          |       | <div><br/></div> |
|                                                                                                  | CAUSE AND EFFECT CHARTS LIST                                                                                                                                                                                             |       |      |            |         |      |          |       |                                                                                                                                                                                      |
|                                                                                                  | شماره پیمان:<br>053 - 073 - 9184                                                                                                                                                                                         | پروژه | بسته | صادر کننده | تسهیلات | رشته | نوع مدرک | سریال |                                                                                                                                                                                      |
|                                                                                                  | BK                                                                                                                                                                                                                       | GCS   | HY   | 120        | IN      | LI   | 0001     | V03   | شماره صفحه: 4 از 14                                                                                                                                                                  |

| ALARM SIGNALS OF COMPRESSOR A     |                |            |                            |               |                                                      |               | TITLE     | SOUR GAS RECIPROCATING COMPRESSOR |  |  |  |  |  |  |
|-----------------------------------|----------------|------------|----------------------------|---------------|------------------------------------------------------|---------------|-----------|-----------------------------------|--|--|--|--|--|--|
| EFFECTS                           |                |            |                            |               |                                                      |               | EQUIP.    | C2101 / C-2102                    |  |  |  |  |  |  |
|                                   |                |            |                            |               |                                                      |               | EFFECT    | COMMON ALARM LAMP LCP             |  |  |  |  |  |  |
|                                   |                |            |                            |               |                                                      |               |           |                                   |  |  |  |  |  |  |
| CAUSE                             |                |            |                            |               |                                                      |               | TAG NO.   | XF-2230A                          |  |  |  |  |  |  |
|                                   |                |            |                            |               |                                                      |               |           |                                   |  |  |  |  |  |  |
| TITLE                             | EQUIP.         | TAG        | Logic Diagram Document No. | P&ID Page No. | DESCRIPTION                                          | INTERLOCK NO. | LOCATION  | LCP                               |  |  |  |  |  |  |
| SOUR GAS RECIPROCATING COMPRESSOR | C2101 / C-2102 | PDT-2122 A | BK-GCS-HY-120-IN-DW-0006   | 1A of 10      | 1ST STAGE SUCTION STRAINER DIFFRENTIAL PRESSURE HIGH |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | PT-2123 A  | BK-GCS-HY-120-IN-DW-0006   | 1A of 10      | 1ST STAGE SUCTION PRESSURE HIGH                      |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TT-2191 A  | BK-GCS-HY-120-IN-DW-0006   | 1A of 10      | 1ST STAGE DISCHARGE TEMPERATURE HIGH                 |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | PT-2124 A  | BK-GCS-HY-120-IN-DW-0006   | 1A of 10      | 1ST STAGE DISCHARGE PRESSURE HIGH                    |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | PT-2132 A  | BK-GCS-HY-120-IN-DW-0006   | 1A of 10      | 2ND STAGE SUCTION PRESSURE LOW                       |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TT-2194 A  | BK-GCS-HY-120-IN-DW-0006   | 1A of 10      | 2ND STAGE DISCHARGE TEMPERATURE HIGH                 |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | PT-2133 A  | BK-GCS-HY-120-IN-DW-0006   | 1A of 10      | 2ND STAGE DISCHARGE PRESSURE HIGH                    |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | PT-2200 A  | BK-GCS-HY-120-IN-DW-0006   | 3A of 10      | LUBRICATOR PRESSURE LOW                              |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | PDT-2132 A | BK-GCS-HY-120-IN-DW-0006   | 1A of 10      | 2ND STAGE SUCTION STRAINER DIFFRENTIAL PRESSURE HIGH |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | LT-2200 A  | BK-GCS-HY-120-IN-DW-0006   | 3A of 10      | CRANK CASE LUBE OIL LEVEL LOW                        |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | PDT-2204 A | BK-GCS-HY-120-IN-DW-0006   | 3A of 10      | LUB OIL FILTER DIFFERENTIAL PRESSURE HIGH            |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | PT-2204 A  | BK-GCS-HY-120-IN-DW-0006   | 3A of 10      | LUB OIL PRESSURE LOW                                 |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TT-2204 A  | BK-GCS-HY-120-IN-DW-0006   | 3A of 10      | LUB OIL TEMPERATURE HIGH                             |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TT-2204 A  | BK-GCS-HY-120-IN-DW-0006   | 3A of 10      | LUB OIL TEMPERATURE LOW                              |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | PT-2210 A  | BK-GCS-HY-120-IN-DW-0006   | 4A of 10      | N2 STREAM PRESSURE LOW                               |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | PT-2211 A  | BK-GCS-HY-120-IN-DW-0006   | 4A of 10      | N2 STREAM PRESSURE LOW                               |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | PT-2212 A  | BK-GCS-HY-120-IN-DW-0006   | 4A of 10      | N2 PURGE PRESSURE HIGH                               |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | LT-2213 A  | BK-GCS-HY-120-IN-DW-0006   | 5A of 10      | COOLING WATER RESERVOIR LEVEL LOW                    |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | PT-2220 A  | BK-GCS-HY-120-IN-DW-0006   | 5A of 10      | COOLING WATER PRESSURE LOW                           |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | PT-2220 A  | BK-GCS-HY-120-IN-DW-0006   | 5A of 10      | COOLING WATER PRESSURE HIGH                          |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TT-2221 A  | BK-GCS-HY-120-IN-DW-0006   | 5A of 10      | COOLING WATER TEMPERATURE LOW                        |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TT-2221 A  | BK-GCS-HY-120-IN-DW-0006   | 5A of 10      | COOLING WATER TEMPERATURE HIGH                       |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TT-2214 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | MAIN MOTOR NDE BEARING TEMPERATURE HIGH              |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TT-2215 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | MAIN MOTOR DE BEARING TEMPERATURE HIGH               |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TT-2216 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | BEARING TEMPERATURE HIGH                             |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TT-2217 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | PACKING TEMPERATURE HIGH                             |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TT-2218 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | BEARING TEMPERATURE HIGH                             |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TT-2219 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | PACKING TEMPERATURE HIGH                             |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TT-2220 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | MID BEARING TEMPERATURE HIGH                         |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | ZT-2200 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | 1ST STAGE ROD DROP HIGH                              |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | ZT-2201 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | 2ND STAGE ROD DROP HIGH                              |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | VT-2200 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | FRAME VIBRATION HIGH                                 |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | VT-2201 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | FRAME VIBRATION HIGH                                 |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | VT-2202 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | FRAME VIBRATION HIGH                                 |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TE-2222 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | MAIN MOTOR WINDING W TEMPERATURE HIGH                |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TE-2225 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | MAIN MOTOR WINDING V TEMPERATURE HIGH                |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | TE-2228 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | MAIN MOTOR WINDING U TEMPERATURE HIGH                |               | UCP 2101A | E                                 |  |  |  |  |  |  |
|                                   |                | XT-2200 A  | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | KEY PHASOR ROTATION SPEED HIGH                       |               | UCP 2101A | E                                 |  |  |  |  |  |  |
| General Notes:                    |                |            |                            |               |                                                      |               |           |                                   |  |  |  |  |  |  |
| LEGEND:                           |                |            |                            |               |                                                      |               |           |                                   |  |  |  |  |  |  |
| LCP: LOCAL CONTROL PANEL          |                |            |                            |               |                                                      |               |           |                                   |  |  |  |  |  |  |
| UCP: UNIT CONTROL PANEL           |                |            |                            |               |                                                      |               |           |                                   |  |  |  |  |  |  |
| MCC: MOTOR CONTROL CENTER         |                |            |                            |               |                                                      |               |           |                                   |  |  |  |  |  |  |
| E: ENERGIZE                       |                |            |                            |               |                                                      |               |           |                                   |  |  |  |  |  |  |
| DE: DE-ENERGIZE                   |                |            |                            |               |                                                      |               |           |                                   |  |  |  |  |  |  |



NISOC

نگهداشت و افزایش تولید میدان نفتی بینک  
سطح الارض و ابنیه تحت الارض / بسته ایستگاه تقویت فشار گاز  
خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک  
(قرارداد BK-HD-GCS-CO-0008\_03)



HAVAYAR  
INDUSTRIAL GROUP

CAUSE AND EFFECT CHARTS LIST

شماره پیمان:  
053 - 073 - 9184

| نسخه | سریال | نوع | رشته | تسهیلات | صادر | بسته | پروژه |
|------|-------|-----|------|---------|------|------|-------|
| V03  | 0001  | LI  | IN   | 120     | HY   | GCS  | BK    |

شماره صفحه: 5 از 14

ALARM SIGNALS OF COMPRESSOR A

EFFECTS

CAUSE

EFFECT

Ready to start

COMPRESSOR START PERMISSION LAMP

TAG NO.

XR-2231A

XSP-2230 A

| TITLE                             | EQUIP.         | TAG                                                                | Logic Diagram Document No. | P&ID Page No. | DESCRIPTION                               | INTERLOCK NO. | LOCATION      | UCP | LCP |
|-----------------------------------|----------------|--------------------------------------------------------------------|----------------------------|---------------|-------------------------------------------|---------------|---------------|-----|-----|
| SOUR GAS RECIPROCATING COMPRESSOR | C2101 / C-2102 | XF-2230A                                                           | BK-GCS-HY-120-IN-DW-0006   | 8A of 10      | NO COMMON ALARM (Lamp Off)                |               | LCP<br>2101 A | DE  | DE  |
|                                   |                | ESDL-2230A                                                         | BK-GCS-HY-120-IN-DW-0006   | 8A of 10      | NO COMMON SHUTDOWN (Lamp Off)             |               | LCP<br>2101 A | DE  | DE  |
|                                   |                | XR-2231A                                                           | BK-GCS-HY-120-IN-DW-0006   | 3A of 10      | AXU. OIL PUMP MOTOR RUN FEED BACK         |               | LCP<br>2101 A | E   | E   |
|                                   |                | PT-2204A                                                           | BK-GCS-HY-120-IN-DW-0006   | 3A of 10      | LUBE OIL PRESSURE                         |               | UCP<br>2101 A | E   |     |
|                                   |                | TT-2204A                                                           | BK-GCS-HY-120-IN-DW-0006   | 3A of 10      | LUBE OIL TEMPERATURE                      |               | UCP<br>2101 A | E   |     |
|                                   |                | PT-2220A                                                           | BK-GCS-HY-120-IN-DW-0006   | 5A of 10      | COOLING WATER PRESSURE                    |               | UCP<br>2101 A | E   |     |
|                                   |                | TT-2221A                                                           | BK-GCS-HY-120-IN-DW-0006   | 5A of 10      | COOLING WATER TEMPERATURE                 |               | UCP<br>2101 A | E   |     |
|                                   |                | CZSO-2225A                                                         | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | BARING DEVICE UNLOCK FEED BACK (ON)       |               | UCP<br>2101 A | E   |     |
|                                   |                | XF-2224A                                                           | BK-GCS-HY-120-IN-DW-0006   | 7A of 10      | NO MAIN MOTOR FAULT                       |               | UCP<br>2101 A | E   |     |
|                                   |                | PT-2210A                                                           | BK-GCS-HY-120-IN-DW-0006   | 4A of 10      | PRESSURE PACKING N2 PRESSURE              |               | UCP<br>2101 A | E   |     |
|                                   |                | PT-2211A                                                           | BK-GCS-HY-120-IN-DW-0006   | 4A of 10      | ROD PACKING N2 PRESSURE                   |               | UCP<br>2101 A | E   |     |
|                                   |                | LT-2200A                                                           | BK-GCS-HY-120-IN-DW-0006   | 3A of 10      | LUBE OIL LEVEL                            |               | UCP<br>2101 A | E   |     |
|                                   |                | PSOV-2201A<br>PSOV-2202A<br>PSOV-2203A<br>PSOV-2204A<br>PSOV-2205A | BK-GCS-HY-120-IN-DW-0006   | 2A of 10      | CAPACITY SWITCH ON 0% LOAD (DE ENERGIZED) |               | UCP<br>2101 A | E   |     |
|                                   |                | HSS-2125A                                                          | BK-GCS-HY-120-IN-DW-0006   | 9A of 10      | CLIENT PERMISSIVE TO START (NOTE 1)       |               | UCP<br>2101 A | E   | E   |

General Notes:

LEGEND:  
LCP: LOCAL CONTROL PANEL  
UCP: UNIT CONTROL PANEL  
MCC: MOTOR CONTROL CENTER  
E: ENERGIZE  
DE: DE-ENERGIZE

NOTE 1: A REQUEST PERMISSION SIGNAL (HSS-2126A) FROM UCP WILL BE SENT TO DCS, THEN START PERMISSION SIGNAL (HSS-2125A) FROM DCS WILL BE SENT TO UCP.



## CAUSE AND EFFECT CHARTS LIST

شماره صفحه: 6 از 14

شماره پیمان:  
053 - 073 - 9184

| نسخه | سریال | نوع مدرک | رشته | تسهیلات | صادر کننده | بسته کاری | پروژه |
|------|-------|----------|------|---------|------------|-----------|-------|
| V03  | 0001  | LI       | IN   | 120     | HY         | GCS       | BK    |

### CONTROL SIGNALS OF COMPRESSOR A

## EFFECTS

## CAUSE

| CONTROL SIGNALS OF COMPRESSOR A |                       |             |                          |           |                                          |           | TITLE     | SOUR GAS RECIPROCATING COMPRESSOR |                   |                      |                       |                      |                     |                      |                              |                             |                |                |                |                |                |
|---------------------------------|-----------------------|-------------|--------------------------|-----------|------------------------------------------|-----------|-----------|-----------------------------------|-------------------|----------------------|-----------------------|----------------------|---------------------|----------------------|------------------------------|-----------------------------|----------------|----------------|----------------|----------------|----------------|
|                                 |                       |             |                          |           |                                          |           | EQUIP.    | C-2101 / C-2102                   |                   |                      |                       |                      |                     |                      |                              |                             |                |                |                |                |                |
|                                 |                       |             |                          |           |                                          |           | EFFECT    | AUX OIL PUMP START                | AUX OIL PUMP STOP | CRANK CASE HEATER ON | CRANK CASE HEATER OFF | AUX WATER PUMP START | AUX WATER PUMP STOP | MAIN WATER PUMP STOP | WATER RESERVOIR HEATER START | WATER RESERVOIR HEATER STOP | INSTRUMENT AIR | INSTRUMENT AIR | INSTRUMENT AIR | INSTRUMENT AIR | INSTRUMENT AIR |
| TAG NO.                         | XSS-2202A<br>(Note 1) | XSP-2202A   | XSS-2203A                | XSP-2203A | XSS-2221A                                | XSP-2221A |           | XSP-222A                          | XSS-2223A         | XSP-2223A            | PSOV-2201A            | PSOV-2202A           | PSOV-2203A          | PSOV-2204A           | PSOV-2205A                   |                             |                |                |                |                |                |
| CAUSE                           |                       |             |                          |           |                                          |           | LOCATION  | MCC                               | MCC               | MCC                  | MCC                   | MCC                  | MCC                 | MCC                  | MCC                          | UCP-2101A                   | UCP-2101A      | UCP-2101A      | UCP-2101A      | UCP-2101A      |                |
|                                 |                       | TT-2203 A   | BK-GCS-HY-120-IN-DW-0006 | 3A of 10  | CRANK CASE LUB OIL TEMPERATURE HIGH      | I-30A     | UCP-2101A |                                   |                   |                      | E                     |                      |                     |                      |                              |                             |                |                |                |                |                |
|                                 |                       | TT-2203 A   | BK-GCS-HY-120-IN-DW-0006 | 3A of 10  | CRANK CASE LUB OIL TEMPERATURE LOW       | I-30A     | UCP-2101A |                                   |                   |                      | E                     |                      |                     |                      |                              |                             |                |                |                |                |                |
|                                 |                       | PT-2204 A   | BK-GCS-HY-120-IN-DW-0006 | 3A of 10  | LUB OIL PRESSURE HIGH                    | I-20A     | UCP-2101A |                                   | E                 |                      |                       |                      |                     |                      |                              |                             |                |                |                |                |                |
|                                 |                       | PT-2204 A   | BK-GCS-HY-120-IN-DW-0006 | 3A of 10  | LUB OIL PRESSURE LOW                     | I-20A     | UCP-2101A | E                                 |                   |                      |                       |                      |                     |                      |                              |                             |                |                |                |                |                |
|                                 |                       | LT-2213 A   | BK-GCS-HY-120-IN-DW-0006 | 5A of 10  | COOLING WATER RESERVOIR LEVEL LOW LOW    | I-22A     | UCP-2101A |                                   |                   |                      |                       |                      | E                   | E                    |                              |                             |                |                |                |                |                |
|                                 |                       | TT-2213 A   | BK-GCS-HY-120-IN-DW-0006 | 5A of 10  | COOLING WATER RESERVOIR TEMPERATURE LOW  | I-26A     | UCP-2101A |                                   |                   |                      |                       |                      |                     |                      | E                            |                             |                |                |                |                |                |
|                                 |                       | TT-2213 A   | BK-GCS-HY-120-IN-DW-0006 | 5A of 10  | COOLING WATER RESERVOIR TEMPERATURE HIGH | I-26A     | UCP-2101A |                                   |                   |                      |                       |                      |                     |                      | E                            |                             |                |                |                |                |                |
|                                 |                       | PT-2220 A   | BK-GCS-HY-120-IN-DW-0006 | 5A of 10  | COOLING WATER LINE PRESSURE LOW          | I-25A     | UCP-2101A |                                   |                   |                      |                       | E                    |                     |                      |                              |                             |                |                |                |                |                |
|                                 |                       | HSL-2242 A1 | BK-GCS-HY-120-IN-DW-0006 | 3A of 10  | LOAD 0% SELECTOR SWITCH ON UCP           | I-40A     | UCP-2101A |                                   |                   |                      |                       |                      |                     |                      |                              |                             | DE             | DE             | DE             | DE             | DE             |
|                                 |                       | HSL-2242 A2 | BK-GCS-HY-120-IN-DW-0006 | 3A of 10  | LOAD 25% SELECTOR SWITCH ON UCP          | I-40A     | UCP-2101A |                                   |                   |                      |                       |                      |                     |                      |                              |                             | E              | DE             | DE             | E              | E              |
|                                 |                       | HSL-2242 A3 | BK-GCS-HY-120-IN-DW-0006 | 3A of 10  | LOAD 50% SELECTOR SWITCH ON UCP (NOTE 1) | I-40A     | UCP-2101A |                                   |                   |                      |                       |                      |                     |                      |                              |                             | DE             | E              | DE             | E              | DE             |
|                                 |                       | HSL-2242 A4 | BK-GCS-HY-120-IN-DW-0006 | 3A of 10  | LOAD 75% SELECTOR SWITCH ON UCP          | I-40A     | UCP-2101A |                                   |                   |                      |                       |                      |                     |                      |                              |                             | E              | E              | E              | E              | E              |
|                                 |                       | HSL-2242 A5 | BK-GCS-HY-120-IN-DW-0006 | 3A of 10  | LOAD 100% SELECTOR SWITCH ON UCP         | I-40A     | UCP-2101A |                                   |                   |                      |                       |                      |                     |                      |                              |                             | E              | E              | E              | E              | DE             |

General Notes:

**LEGEND:**  
LCP: LOCAL CONTROL PANEL  
UCP: UNIT CONTROL PANEL  
MCC: MOTOR CONTROL CENTER  
E: ENERGIZE  
DE: DE-ENERGIZE

NOTE 1: THE CRANK-END (PSOV-2201 A / 2204 A) AND HEAD-END (PSOV-2202 A / 2203 A) SIDES WILL BE CHANGED ALTERNATELY AS MENTIONED IN CONTROL PHILOSOPHY ("BK-GCS-HY-120-PR-PH-0001").



053 - 073 - 9184

تکهداشت و افزایش تولید میدان نفتی بینک  
سطح الارض و ابنیه تحت الارض بسته ایستگاه تقویت فشار گاز  
خرید پکیج های کمپرسور گاز (دفت و برگشتی) بینک  
(قاردا 03 BK-HD-GCS-CO-0008)



شماره صفحه: 7 از 14

## CAUSE AND EFFECT CHARTS LIST

|                     |      |        |          |      |        |            |           |       |                  |
|---------------------|------|--------|----------|------|--------|------------|-----------|-------|------------------|
| شماره صفحه: 7 از 14 | نسخه | سریتال | نوع مدرک | رشته | تهیهات | صادر کننده | بسته کاری | پروژه | شماره پیمان:     |
|                     | V03  | 0001   | LI       | IN   | 120    | HY         | GCS       | BK    | 053 - 073 - 9184 |

### START AND SHUTDOWN OF COMPRESSOR B

## EFFECTS

## CAUSE

[illegible]

LEGEND:  
LCP: LOCAL CONTROL PANEL  
UCP: UNIT CONTROL PANEL  
MCC: MOTOR CONTROL CENTER  
E: ENERGIZE  
DE: DE-ENERGIZE

NOTE 1: THE START PERMISSIVE REQUEST FROM UCP TO DCS, START PERMISSION OF UCP, AND START SEQUENCE (AUTOMATICALLY) SHALL BE CONSIDERED WHEN THE COMPRESSOR START IS FROM UCP.  
NOTE 2: DURING THE COMPRESSOR STOP, WILL BE STOPPED WITH DELAY TIME.  
NOTE 3: BEFORE STARTING THE COMPRESSOR FROM LCP, PREHEATING AND PRELUBRICATION STEPS (DISCUSSED IN CONTROL PHILOSOPHY "BK-GCS-HY-120-PR-PH-0001") SHALL BE DONE BY OPERATOR VIA LCP.

|                                                                                           |                                                                                                                                                                                      |      |            |         |      |          |       |                                                                                                                   |
|-------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------------|---------|------|----------|-------|-------------------------------------------------------------------------------------------------------------------|
| <br>NISOC | نگهداشت و افزایش تولید میدان نفتی بینک<br>سطح الارض و ابنیه تحت الارض/بسته ایستگاه تقویت فشار گاز<br>خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک<br>(قرارداد BK-HD-GCS-CO-0008_03) |      |            |         |      |          |       | <br>HAVAYAR<br>INDUSTRIAL GROUP |
|                                                                                           | CAUSE AND EFFECT CHARTS LIST                                                                                                                                                         |      |            |         |      |          |       |                                                                                                                   |
| شماره پیمان:<br>053 - 073 - 9184                                                          | پروژه                                                                                                                                                                                | بسته | صادر کننده | تسهیلات | رشته | نوع مدرک | سریال | نسخه                                                                                                              |
|                                                                                           | BK                                                                                                                                                                                   | GCS  | HY         | 120     | IN   | LI       | 0001  | V03                                                                                                               |
| شماره صفحه: 8 از 14                                                                       |                                                                                                                                                                                      |      |            |         |      |          |       |                                                                                                                   |

| ALARM SIGNALS OF COMPRESSOR B       |                |            |                            |               |                                                       |               | TITLE     | SOUR GAS RECIPROCATING COMPRESSOR |  |  |  |  |  |         |
|-------------------------------------|----------------|------------|----------------------------|---------------|-------------------------------------------------------|---------------|-----------|-----------------------------------|--|--|--|--|--|---------|
| <div>CAUSE</div> <div>EFFECTS</div> |                |            |                            |               |                                                       |               | EQUIP.    | C2101 / C-2102                    |  |  |  |  |  |         |
|                                     |                |            |                            |               |                                                       |               | EFFECT    | COMMON ALARM LAMP LCP             |  |  |  |  |  |         |
|                                     |                |            |                            |               |                                                       |               |           |                                   |  |  |  |  |  | TAG NO. |
| TITLE                               | EQUIP.         | TAG        | Logic Diagram Document No. | P&ID Page No. | DESCRIPTION                                           | INTERLOCK NO. | LOCATION  | LCP                               |  |  |  |  |  |         |
| SOUR GAS RECIPROCATING COMPRESSOR   | C2101 / C-2102 | PDT-2122 B | BK-GCS-HY-120-IN-DW-0006   | 1B of 10      | 1ST STAGE SUCTION STRAINER DIFFERENTIAL PRESSURE HIGH |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | PT-2123 B  | BK-GCS-HY-120-IN-DW-0006   | 1B of 10      | 1ST STAGE SUCTION PRESSURE HIGH                       |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TT-2191 B  | BK-GCS-HY-120-IN-DW-0006   | 1B of 10      | 1ST STAGE DISCHARGE TEMPERATURE HIGH                  |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | PT-2124 B  | BK-GCS-HY-120-IN-DW-0006   | 1B of 10      | 1ST STAGE DISCHARGE PRESSURE HIGH                     |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | PT-2132 B  | BK-GCS-HY-120-IN-DW-0006   | 1B of 10      | 2ND STAGE SUCTION PRESSURE LOW                        |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TT-2194 B  | BK-GCS-HY-120-IN-DW-0006   | 1B of 10      | 2ND STAGE DISCHARGE TEMPERATURE HIGH                  |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | PT-2133 B  | BK-GCS-HY-120-IN-DW-0006   | 1B of 10      | 2ND STAGE DISCHARGE PRESSURE HIGH                     |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | PT-2200 B  | BK-GCS-HY-120-IN-DW-0006   | 3B of 10      | LUBRICATOR PRESSURE LOW                               |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | PDT-2132 B | BK-GCS-HY-120-IN-DW-0006   | 1B of 10      | 2ND STAGE SUCTION STRAINER DIFFERENTIAL PRESSURE HIGH |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | LT-2200 B  | BK-GCS-HY-120-IN-DW-0006   | 3B of 10      | CRANK CASE LUBE OIL LEVEL LOW                         |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | PDT-2204 B | BK-GCS-HY-120-IN-DW-0006   | 3B of 10      | LUB OIL FILTER DIFFERENTIAL PRESSURE HIGH             |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | PT-2204 B  | BK-GCS-HY-120-IN-DW-0006   | 3B of 10      | LUB OIL PRESSURE LOW                                  |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TT-2204 B  | BK-GCS-HY-120-IN-DW-0006   | 3B of 10      | LUB OIL TEMPERATURE HIGH                              |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TT-2204 B  | BK-GCS-HY-120-IN-DW-0006   | 3B of 10      | LUB OIL TEMPERATURE LOW                               |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | PT-2210 B  | BK-GCS-HY-120-IN-DW-0006   | 4B of 10      | N2 STREAM PRESSURE LOW                                |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | PT-2211 B  | BK-GCS-HY-120-IN-DW-0006   | 4B of 10      | N2 STREAM PRESSURE LOW                                |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | PT-2212 B  | BK-GCS-HY-120-IN-DW-0006   | 4B of 10      | N2 PURGE PRESSURE HIGH                                |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | LT-2213 B  | BK-GCS-HY-120-IN-DW-0006   | 5B of 10      | COOLING WATER RESERVOIR LEVEL LOW                     |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | PT-2220 B  | BK-GCS-HY-120-IN-DW-0006   | 5B of 10      | COOLING WATER PRESSURE LOW                            |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | PT-2220 B  | BK-GCS-HY-120-IN-DW-0006   | 5B of 10      | COOLING WATER PRESSURE HIGH                           |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TT-2221 B  | BK-GCS-HY-120-IN-DW-0006   | 5B of 10      | COOLING WATER TEMPERATURE LOW                         |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TT-2221 B  | BK-GCS-HY-120-IN-DW-0006   | 5B of 10      | COOLING WATER TEMPERATURE HIGH                        |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TT-2214 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | MAIN MOTOR NDE BEARING TEMPERATURE HIGH               |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TT-2215 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | MAIN MOTOR DE BEARING TEMPERATURE HIGH                |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TT-2216 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | BEARING TEMPERATURE HIGH                              |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TT-2217 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | PACKING TEMPERATURE HIGH                              |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TT-2218 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | BEARING TEMPERATURE HIGH                              |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TT-2219 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | PACKING TEMPERATURE HIGH                              |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TT-2220 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | MID BEARING TEMPERATURE HIGH                          |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | ZT-2200 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | 1ST STAGE ROD DROP HIGH                               |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | ZT-2201 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | 2ND STAGE ROD DROP HIGH                               |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | VT-2200 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | FRAME VIBRATION HIGH                                  |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | VT-2201 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | FRAME VIBRATION HIGH                                  |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | VT-2202 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | FRAME VIBRATION HIGH                                  |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TE-2222 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | MAIN MOTOR WINDING W TEMPERATURE HIGH                 |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TE-2225 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | MAIN MOTOR WINDING V TEMPERATURE HIGH                 |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | TE-2228 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | MAIN MOTOR WINDING U TEMPERATURE HIGH                 |               | UCP 2101B | E                                 |  |  |  |  |  |         |
|                                     |                | XT-2200 B  | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | KEY PHASOR ROTATION SPEED HIGH                        |               | UCP 2101B | E                                 |  |  |  |  |  |         |
| General Notes:                      |                |            |                            |               |                                                       |               |           |                                   |  |  |  |  |  |         |
| LEGEND:                             |                |            |                            |               |                                                       |               |           |                                   |  |  |  |  |  |         |
| LCP: LOCAL CONTROL PANEL            |                |            |                            |               |                                                       |               |           |                                   |  |  |  |  |  |         |
| UCP: UNIT CONTROL PANEL             |                |            |                            |               |                                                       |               |           |                                   |  |  |  |  |  |         |
| MCC: MOTOR CONTROL CENTER           |                |            |                            |               |                                                       |               |           |                                   |  |  |  |  |  |         |
| E: ENERGIZE                         |                |            |                            |               |                                                       |               |           |                                   |  |  |  |  |  |         |
| DE: DE-ENERGIZE                     |                |            |                            |               |                                                       |               |           |                                   |  |  |  |  |  |         |





NISOC

نگهداشت و افزایش تولید میدان نفتی بینک  
سطح الارض و ابنیه تحت الارض / بسته ایستگاه تقویت فشار گاز  
خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک  
(قرارداد BK-HD-GCS-CO-0008\_03)



CAUSE AND EFFECT CHARTS LIST

شماره پیمان:  
053 - 073 - 9184

| نسخه | سریال | نوع | رشته | تسهیلات | صادر | بسته | پروژه |
|------|-------|-----|------|---------|------|------|-------|
| V03  | 0001  | LI  | IN   | 120     | HY   | GCS  | BK    |

شماره صفحه: 9 از 14

ALARM SIGNALS OF COMPRESSOR B

EFFECTS

CAUSE

| TITLE                             | EQUIP.         | TAG                                                                | Logic Diagram Document No. | P&ID Page No. | DESCRIPTION                               | INTERLOCK NO. | LOCATION   | UCP | LCP |
|-----------------------------------|----------------|--------------------------------------------------------------------|----------------------------|---------------|-------------------------------------------|---------------|------------|-----|-----|
| SOUR GAS RECIPROCATING COMPRESSOR | C2101 / C-2102 | XF-2230B                                                           | BK-GCS-HY-120-IN-DW-0006   | 8B of 10      | NO COMMON ALARM (Lamp Off)                |               | UCP 2101 B | DE  | DE  |
|                                   |                | ESDL-2230B                                                         | BK-GCS-HY-120-IN-DW-0006   | 8B of 10      | NO COMMON SHUTDOWN (Lamp Off)             |               | UCP 2101 B | DE  | DE  |
|                                   |                | XR-2231B                                                           | BK-GCS-HY-120-IN-DW-0006   | 3B of 10      | AXU. OIL PUMP MOTOR RUN FEED BACK         |               | UCP 2101 B | E   | E   |
|                                   |                | PT-2204B                                                           | BK-GCS-HY-120-IN-DW-0006   | 3B of 10      | LUBE OIL PRESSURE                         |               | UCP 2101 B | E   |     |
|                                   |                | TT-2204B                                                           | BK-GCS-HY-120-IN-DW-0006   | 3B of 10      | LUBE OIL TEMPERATURE                      |               | UCP 2101 B | E   |     |
|                                   |                | PT-2220B                                                           | BK-GCS-HY-120-IN-DW-0006   | 5B of 10      | COOLING WATER PRESSURE                    |               | UCP 2101 B | E   |     |
|                                   |                | TT-2221B                                                           | BK-GCS-HY-120-IN-DW-0006   | 5B of 10      | COOLING WATER TEMPERATURE                 |               | UCP 2101 B | E   |     |
|                                   |                | CZSO-2225B                                                         | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | BARING DEVICE UNLOCK FEED BACK (ON)       |               | UCP 2101 B | E   |     |
|                                   |                | XF-2224B                                                           | BK-GCS-HY-120-IN-DW-0006   | 7B of 10      | NO MAIN MOTOR FAULT                       |               | UCP 2101 B | E   |     |
|                                   |                | PT-2210B                                                           | BK-GCS-HY-120-IN-DW-0006   | 4B of 10      | PRESSURE PACKING N2 PRESSURE              |               | UCP 2101 B | E   |     |
|                                   |                | PT-2211B                                                           | BK-GCS-HY-120-IN-DW-0006   | 4B of 10      | ROD PACKING N2 PRESSURE                   |               | UCP 2101 B | E   |     |
|                                   |                | LT-2200B                                                           | BK-GCS-HY-120-IN-DW-0006   | 3B of 10      | LUBE OIL LEVEL                            |               | UCP 2101 B | E   |     |
|                                   |                | PSOV-2201B<br>PSOV-2202B<br>PSOV-2203B<br>PSOV-2204B<br>PSOV-2205B | BK-GCS-HY-120-IN-DW-0006   | 2B of 10      | CAPACITY SWITCH ON 0% LOAD (DE ENERGIZED) |               | UCP 2101 B | E   |     |
|                                   |                | HSS-2125B                                                          | BK-GCS-HY-120-IN-DW-0006   | 9B of 10      | CLIENT PERMISSIVE TO START (NOTE 1)       |               | UCP 2101 B | E   | E   |

General Notes:

LEGEND:  
LCP: LOCAL CONTROL PANEL  
UCP: UNIT CONTROL PANEL  
MCC: MOTOR CONTROL CENTER  
E: ENERGIZE  
DE: DE-ENERGIZE

NOTE 1: A REQUEST PERMISSION SIGNAL (HSS-2126B) FROM UCP WILL BE SENT TO DCS, THEN START PERMISSION SIGNAL (HSS-2125B) FROM DCS WILL BE SENT TO UCP.



## CAUSE AND EFFECT CHARTS LIST

شماره صفحه: 10 از 14

شماره پیمان:  
053 - 073 - 9184

| نسخه | سریال | نوع مدرک | رشته | تسهیلات | صادر کننده | بسته کاری | پروژه |
|------|-------|----------|------|---------|------------|-----------|-------|
| V03  | 0001  | LI       | IN   | 120     | HY         | GCS       | BK    |

### CONTROL SIGNALS OF COMPRESSOR B

## EFFECTS

## CAUSE

| CONTROL SIGNALS OF COMPRESSOR B |                          |             |                                  |          |                                          |       | TITLE        | SOUR GAS RECIPROCATING COMPRESSOR |                      |                   |                      |                       |                      |                     |                      |                              |                             |                |                |                |                |                |              |              |    |
|---------------------------------|--------------------------|-------------|----------------------------------|----------|------------------------------------------|-------|--------------|-----------------------------------|----------------------|-------------------|----------------------|-----------------------|----------------------|---------------------|----------------------|------------------------------|-----------------------------|----------------|----------------|----------------|----------------|----------------|--------------|--------------|----|
|                                 |                          |             |                                  |          |                                          |       | EQUIP.       | C-2101 / C-2102                   |                      |                   |                      |                       |                      |                     |                      |                              |                             |                |                |                |                |                |              |              |    |
|                                 |                          |             |                                  |          |                                          |       |              | EFFECT                            | AUX OIL PUMP START   | AUX OIL PUMP STOP | CRANK CASE HEATER ON | CRANK CASE HEATER OFF | AUX WATER PUMP START | AUX WATER PUMP STOP | MAIN WATER PUMP STOP | WATER RESERVOIR HEATER START | WATER RESERVOIR HEATER STOP | INSTRUMENT AIR | INSTRUMENT AIR | INSTRUMENT AIR | INSTRUMENT AIR | INSTRUMENT AIR |              |              |    |
| EFFECTS                         |                          |             |                                  |          |                                          |       | TAG NO.      |                                   | XSS-2202B<br>(Note1) | XSP-2202B         | XSS-2203B            | XSP-2203B             | XSS-2221B            | XSP-2221B           | XSP-2222B            | XSS-2223B                    | XSP-2223B                   | PSOV-2201B     | PSOV-2202B     | PSOV-2203B     | PSOV-2204B     | PSOV-2205B     |              |              |    |
|                                 |                          |             |                                  |          |                                          |       | EQUIP.       | MCC                               | MCC                  | MCC               | MCC                  | MCC                   | MCC                  | MCC                 | MCC                  | MCC                          | MCC                         | MCC            | MCC            | UCP<br>2101B   | UCP<br>2101B   | UCP<br>2101B   | UCP<br>2101B | UCP<br>2101B |    |
| CAUSE                           |                          |             |                                  |          |                                          |       |              | LOCATION                          | MCC                  | MCC               | MCC                  | MCC                   | MCC                  | MCC                 | MCC                  | MCC                          | MCC                         | MCC            | MCC            | MCC            | MCC            | MCC            | MCC          |              |    |
|                                 |                          | TT-2203 B   | BK-GCS-HY-120-IN-DW-0006         | 3B of 10 | CRANK CASE LUB OIL TEMPERATURE HIGH      | I-30B | UCP<br>2101B |                                   |                      |                   | E                    |                       |                      |                     |                      |                              |                             |                |                |                |                |                |              |              |    |
|                                 |                          | TT-2203 B   | BK-GCS-HY-120-IN-DW-0006         | 3B of 10 | CRANK CASE LUB OIL TEMPERATURE LOW       | I-30B | UCP<br>2101B |                                   |                      |                   | E                    |                       |                      |                     |                      |                              |                             |                |                |                |                |                |              |              |    |
|                                 |                          | PT-2204 B   | BK-GCS-HY-120-IN-DW-0006         | 3B of 10 | LUB OIL PRESSURE HIGH                    | I-20B | UCP<br>2101B |                                   | E                    |                   |                      |                       |                      |                     |                      |                              |                             |                |                |                |                |                |              |              |    |
|                                 |                          | PT-2204 B   | BK-GCS-HY-120-IN-DW-0006         | 3B of 10 | LUB OIL PRESSURE LOW                     | I-20B | UCP<br>2101B | E                                 |                      |                   |                      |                       |                      |                     |                      |                              |                             |                |                |                |                |                |              |              |    |
|                                 |                          | LT-2213 B   | BK-GCS-HY-120-IN-DW-0006         | 5B of 10 | COOLING WATER RESERVOIR LEVEL LOW LOW    | I-22B | UCP<br>2101B |                                   |                      |                   |                      |                       |                      | E                   | E                    |                              |                             |                |                |                |                |                |              |              |    |
|                                 |                          | TT-2213 B   | BK-GCS-HY-120-IN-DW-0006         | 5B of 10 | COOLING WATER RESERVOIR TEMPERATURE LOW  | I-26B | UCP<br>2101B |                                   |                      |                   |                      |                       |                      |                     |                      |                              | E                           |                |                |                |                |                |              |              |    |
|                                 |                          | TT-2213 B   | BK-GCS-HY-120-IN-DW-0006         | 5B of 10 | COOLING WATER RESERVOIR TEMPERATURE HIGH | I-26B | UCP<br>2101B |                                   |                      |                   |                      |                       |                      |                     |                      |                              |                             | E              |                |                |                |                |              |              |    |
|                                 |                          | PT-2220 B   | BK-GCS-HY-120-IN-DW-0006         | 5B of 10 | COOLING WATER LINE PRESSURE LOW          | I-25B | UCP<br>2101B |                                   |                      |                   |                      | E                     |                      |                     |                      |                              |                             |                |                |                |                |                |              |              |    |
|                                 |                          | HSL-2242 B1 | BK-GCS-HY-120-IN-DW-0006         | 3B of 10 | LOAD 0% SELECTOR SWITCH ON UCP           | I-40B | UCP<br>2101B |                                   |                      |                   |                      |                       |                      |                     |                      |                              |                             |                | DE             | DE             | DE             | DE             | DE           | DE           | DE |
|                                 |                          | HSL-2242 B2 | BK-GCS-HY-120-IN-DW-0006         | 3B of 10 | LOAD 25% SELECTOR SWITCH ON UCP          | I-40B | UCP<br>2101B |                                   |                      |                   |                      |                       |                      |                     |                      |                              |                             |                |                | E              | DE             | DE             | DE           | E            | E  |
|                                 |                          | HSL-2242 B3 | BK-GCS-HY-120-IN-DW-0006         | 3B of 10 | LOAD 50% SELECTOR SWITCH ON UCP (NOTE 1) | I-40B | UCP<br>2101B |                                   |                      |                   |                      |                       |                      |                     |                      |                              |                             |                |                | DE             | E              | DE             | DE           | E            | DE |
|                                 |                          | HSL-2242 B4 | BK-GCS-HY-120-IN-DW-0006         | 3B of 10 | LOAD 75% SELECTOR SWITCH ON UCP          | I-40B | UCP<br>2101B |                                   |                      |                   |                      |                       |                      |                     |                      |                              |                             |                |                | E              | E              | E              | E            | E            | E  |
| HSL-2242 B5                     | BK-GCS-HY-120-IN-DW-0006 | 3B of 10    | LOAD 100% SELECTOR SWITCH ON UCP | I-40B    | UCP<br>2101B                             |       |              |                                   |                      |                   |                      |                       |                      |                     |                      |                              |                             | E              | E              | E              | E              | E              | DE           |              |    |

General Notes:

**LEGEND:**  
LCP: LOCAL CONTROL PANEL  
UCP: UNIT CONTROL PANEL  
MCC: MOTOR CONTROL CENTER  
E: ENERGIZE  
DE: DE-ENERGIZE

NOTE 1: THE CRANK-END (PSOV-2201 B / 2204 B) AND HEAD-END (PSOV-2202 B / 2203 B) SIDES WILL BE CHANGED ALTERNATELY AS MENTIONED IN CONTROL PHILOSOPHY ("BK-GCS-HY-120-PR-PH-0001").



053 - 073 - 9184

تنگداشت و افزایش تولید میدان نفتی بینک  
سطح الارض و ابنیه تحت الارض بسته ایستگاه تقویت فشار گاز  
خرید پکیج های کمپرسور گاز (دفت و برگشتی) بینک  
(قرارداد 03 BK-HD-GCS-CO-0008)



شماره صفحه: 11 از 14

## CAUSE AND EFFECT CHARTS LIST

|                      |      |        |          |      |         |            |           |       |                  |
|----------------------|------|--------|----------|------|---------|------------|-----------|-------|------------------|
| شماره صفحه: 11 از 14 | نسخه | سریتال | نوع مدرک | رشته | تجهیزات | صادر کننده | بسته کاری | پروژه | شماره پیمان:     |
|                      | V03  | 0001   | LI       | IN   | 120     | HY         | GCS       | BK    | 053 - 073 - 9184 |

شماره صفحه: 11 از 14

### START AND SHUTDOWN OF COMPRESSOR C

## EFFECTS

## CAUSE

[illegible]

LEGEND:  
LCP: LOCAL CONTROL PANEL  
UCP: UNIT CONTROL PANEL  
MCC: MOTOR CONTROL CENTER  
E: ENERGIZE  
DE: DE-ENERGIZE

NOTE 1: THE START PERMISSIVE REQUEST FROM UCP TO DCS, START PERMISSION OF UCP, AND START SEQUENCE (AUTOMATICALLY) SHALL BE CONSIDERED WHEN THE COMPRESSOR START IS FROM UCP.  
NOTE 2: DURING THE COMPRESSOR STOP, WILL BE STOPPED WITH DELAY TIME.  
NOTE 3: BEFORE STARTING THE COMPRESSOR FROM UCP, PREHEATING AND PRELUBRICATION STEPS (DISCUSSED IN CONTROL PHILOSOPHY"BIK-GCS-HY-120-PR-PH-4001") SHALL BE DONE BY OPERATOR VIA LCU.



## شماره صفحه: 12 از 14

|                                                                                                                               |  |
|-------------------------------------------------------------------------------------------------------------------------------|--|
| General Notes:                                                                                                                |  |
| LEGEND:<br>LCP: LOCAL CONTROL PANEL<br>UCP: UNIT CONTROL PANEL<br>MCC: MOTOR CONTROL CENTER<br>E: ENERGIZE<br>DE: DE-ENERGIZE |  |



NISOC

نگهداشت و افزایش تولید میدان نفتی بینک  
سطح الارض و ابنیه تحت الارض / بسته ایستگاه تقویت فشار گاز  
خرید پکیج های کمپرسور گاز (رفت و برگشتی) بینک  
(قرارداد BK-HD-GCS-CO-0008\_03)



HAVAYAR  
INDUSTRIAL GROUP

CAUSE AND EFFECT CHARTS LIST

شماره پیمان:  
053 - 073 - 9184

| نسخه | سریال | نوع | رشته | تسهیلات | صادر | بسته | پروژه |
|------|-------|-----|------|---------|------|------|-------|
| V03  | 0001  | LI  | IN   | 120     | HY   | GCS  | BK    |

شماره صفحه: 13 از 14

ALARM SIGNALS OF COMPRESSOR C

EFFECTS

CAUSE

EFFECT

Ready to start

COMPRESSOR START PERMISSION LAMP

TAG NO.

XR-2231C

XSP-2230 C

| TITLE                             | EQUIP.         | TAG                                                                | Logic Diagram Document No. | P&ID Page No. | DESCRIPTION                               | INTERLOCK NO. | LOCATION   | UCP | LCP |
|-----------------------------------|----------------|--------------------------------------------------------------------|----------------------------|---------------|-------------------------------------------|---------------|------------|-----|-----|
| SOUR GAS RECIPROCATING COMPRESSOR | C2101 / C-2102 | XF-2230C                                                           | BK-GCS-HY-120-IN-DW-0006   | 8C of 10      | NO COMMON ALARM (Lamp Off)                |               | LCP 2101 C | DE  | DE  |
|                                   |                | ESDL-2230C                                                         | BK-GCS-HY-120-IN-DW-0006   | 8C of 10      | NO COMMON SHUTDOWN (Lamp Off)             |               | LCP 2101 C | DE  | DE  |
|                                   |                | XR-2231C                                                           | BK-GCS-HY-120-IN-DW-0006   | 3C of 10      | AXU. OIL PUMP MOTOR RUN FEED BACK         |               | LCP 2101 C | E   | E   |
|                                   |                | PT-2204C                                                           | BK-GCS-HY-120-IN-DW-0006   | 3C of 10      | LUBE OIL PRESSURE                         |               | UCP 2101 C | E   |     |
|                                   |                | TT-2204C                                                           | BK-GCS-HY-120-IN-DW-0006   | 3C of 10      | LUBE OIL TEMPERATURE                      |               | UCP 2101 C | E   |     |
|                                   |                | PT-2220C                                                           | BK-GCS-HY-120-IN-DW-0006   | 5C of 10      | COOLING WATER PRESSURE                    |               | UCP 2101 C | E   |     |
|                                   |                | TT-2221C                                                           | BK-GCS-HY-120-IN-DW-0006   | 5C of 10      | COOLING WATER TEMPERATURE                 |               | UCP 2101 C | E   |     |
|                                   |                | CZSO-2225C                                                         | BK-GCS-HY-120-IN-DW-0006   | 7C of 10      | BARING DEVICE UNLOCK FEED BACK (ON)       |               | UCP 2101 C | E   |     |
|                                   |                | XF-2224C                                                           | BK-GCS-HY-120-IN-DW-0006   | 7C of 10      | NO MAIN MOTOR FAULT                       |               | UCP 2101 C | E   |     |
|                                   |                | PT-2210C                                                           | BK-GCS-HY-120-IN-DW-0006   | 4C of 10      | PRESSURE PACKING N2 PRESSURE              |               | UCP 2101 C | E   |     |
|                                   |                | PT-2211C                                                           | BK-GCS-HY-120-IN-DW-0006   | 4C of 10      | ROD PACKING N2 PRESSURE                   |               | UCP 2101 C | E   |     |
|                                   |                | LT-2200C                                                           | BK-GCS-HY-120-IN-DW-0006   | 3C of 10      | LUBE OIL LEVEL                            |               | UCP 2101 C | E   |     |
|                                   |                | PSOV-2201C<br>PSOV-2202C<br>PSOV-2203C<br>PSOV-2204C<br>PSOV-2205C | BK-GCS-HY-120-IN-DW-0006   | 2C of 10      | CAPACITY SWITCH ON 0% LOAD (DE ENERGIZED) |               | UCP 2101 C | E   |     |
|                                   |                | HSS-2125C                                                          | BK-GCS-HY-120-IN-DW-0006   | 9C of 10      | CLIENT PERMISSIVE TO START (NOTE 1)       |               | UCP 2101 C | E   | E   |

General Notes:

LEGEND:  
LCP: LOCAL CONTROL PANEL  
UCP: UNIT CONTROL PANEL  
MCC: MOTOR CONTROL CENTER  
E: ENERGIZE  
DE: DE-ENERGIZE

NOTE 1: A REQUEST PERMISSION SIGNAL (HSS-2126C) FROM UCP WILL BE SENT TO DCS, THEN START PERMISSION SIGNAL (HSS-2125C) FROM DCS WILL BE SENT TO UCP.



## CAUSE AND EFFECT CHARTS LIST

شماره صفحه: 14 از 14

شماره پیمان:  
053 - 073 - 9184

| نسخه | سریال | نوع مدرک | رشته | تسهیلات | صادر کننده | بسته کاری | پروژه |
|------|-------|----------|------|---------|------------|-----------|-------|
| V03  | 0001  | LI       | IN   | 120     | HY         | GCS       | BK    |

### CONTROL SIGNALS OF COMPRESSOR C

|       |                                   |
|-------|-----------------------------------|
| TITLE | SOUR GAS RECIPROCATING COMPRESSOR |
|-------|-----------------------------------|

## EFFECTS

## CAUSE

| TITLE | EQUIP. | TAG         | Logic Diagram Document No. | P&ID Page No. | DESCRIPTION                              | INTERLOCK NO. | LOCATION  | MCC | MCC | MCC | MCC | MCC | MCC | MCC | MCC | MCC | MCC | UCP 2101C | UCP 2101C | UCP 2101C | UCP 2101C | UCP 2101C |    |
|-------|--------|-------------|----------------------------|---------------|------------------------------------------|---------------|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----------|-----------|-----------|-----------|-----------|----|
|       |        | TT-2203 C   | BK-GCS-HY-120-IN-DW-0006   | 3C of 10      | CRANK CASE LUB OIL TEMPERATURE HIGH      | I-30C         | UCP 2101C |     |     |     | E   |     |     |     |     |     |     |           |           |           |           |           |    |
|       |        | TT-2203 C   | BK-GCS-HY-120-IN-DW-0006   | 3C of 10      | CRANK CASE LUB OIL TEMPERATURE LOW       | I-30C         | UCP 2101C |     |     | E   |     |     |     |     |     |     |     |           |           |           |           |           |    |
|       |        | PT-2204 C   | BK-GCS-HY-120-IN-DW-0006   | 3C of 10      | LUB OIL PRESSURE HIGH                    | I-20C         | UCP 2101C |     | E   |     |     |     |     |     |     |     |     |           |           |           |           |           |    |
|       |        | PT-2204 C   | BK-GCS-HY-120-IN-DW-0006   | 3C of 10      | LUB OIL PRESSURE LOW                     | I-20C         | UCP 2101C | E   |     |     |     |     |     |     |     |     |     |           |           |           |           |           |    |
|       |        | LT-2213 C   | BK-GCS-HY-120-IN-DW-0006   | 5C of 10      | COOLING WATER RESERVOIR LEVEL LOW LOW    | I-22C         | UCP 2101C |     |     |     |     |     | E   | E   |     |     |     |           |           |           |           |           |    |
|       |        | TT-2213 C   | BK-GCS-HY-120-IN-DW-0006   | 5C of 10      | COOLING WATER RESERVOIR TEMPERATURE LOW  | I-26C         | UCP 2101C |     |     |     |     |     |     |     | E   |     |     |           |           |           |           |           |    |
|       |        | TT-2213 C   | BK-GCS-HY-120-IN-DW-0006   | 5C of 10      | COOLING WATER RESERVOIR TEMPERATURE HIGH | I-26C         | UCP 2101C |     |     |     |     |     |     |     |     | E   |     |           |           |           |           |           |    |
|       |        | PT-2220 C   | BK-GCS-HY-120-IN-DW-0006   | 5C of 10      | COOLING WATER LINE PRESSURE LOW          | I-25C         | UCP 2101C |     |     |     |     | E   |     |     |     |     |     |           |           |           |           |           |    |
|       |        | HSL-2242 C1 | BK-GCS-HY-120-IN-DW-0006   | 3C of 10      | LOAD 0% SELECTOR SWITCH ON UCP           | I-40C         | UCP 2101C |     |     |     |     |     |     |     |     |     |     |           | DE        | DE        | DE        | DE        | DE |
|       |        | HSL-2242 C2 | BK-GCS-HY-120-IN-DW-0006   | 3C of 10      | LOAD 25% SELECTOR SWITCH ON UCP          | I-40C         | UCP 2101C |     |     |     |     |     |     |     |     |     |     |           | E         | DE        | DE        | E         | E  |
|       |        | HSL-2242 C3 | BK-GCS-HY-120-IN-DW-0006   | 3C of 10      | LOAD 50% SELECTOR SWITCH ON UCP (NOTE 1) | I-40C         | UCP 2101C |     |     |     |     |     |     |     |     |     |     |           | DE        | E         | DE        | E         | DE |
|       |        | HSL-2242 C4 | BK-GCS-HY-120-IN-DW-0006   | 3C of 10      | LOAD 75% SELECTOR SWITCH ON UCP          | I-40C         | UCP 2101C |     |     |     |     |     |     |     |     |     |     |           | E         | E         | E         | E         | E  |
|       |        | HSL-2242 C5 | BK-GCS-HY-120-IN-DW-0006   | 3C of 10      | LOAD 100% SELECTOR SWITCH ON UCP         | I-40C         | UCP 2101C |     |     |     |     |     |     |     |     |     |     |           | E         | E         | E         | E         | DE |

General Notes:

**LEGEND:**  
LCP: LOCAL CONTROL PANEL  
UCP: UNIT CONTROL PANEL  
MCC: MOTOR CONTROL CENTER  
E: ENERGIZE  
DE: DE-ENERGIZE

NOTE 1: THE CRANK-END (PSOV-2201 C / 2204 C) AND HEAD-END (PSOV-2202 C / 2203 C) SIDES WILL BE CHANGED ALTERNATELY AS MENTIONED IN CONTROL PHILOSOPHY ("BK-GCS-HY-120-PR-PH-0001").