SUBJECT **HAULOVER CANAL BRIDGE – OPERATING INSTRUCTIONS**

TABLE OF CONTENTS

PURPOSE....3
SCOPE AND APPLICABILITY....3
PROCESS....3
1. PERSONAL AND OPERATIONAL HAZARDS....3
2. SAFETY EQUIPMENT....3
3. ESSENTIAL PERSONNEL....4
4. BRIDGE OPERATION RECORDS....4
5. GENERAL INSTRUCTIONS FOR BRIDGE OPERATIONS....7
6. CONTROL CONSOLE BYPASS SWITCHES....7
7. BRIDGE MAINTENANCE WORK....7
8. BRIDGE MAINTENANCE COMMUICATION....8
9. QUALITY INSPECTION REQUIREMENTS....9
10. OPERATION RESTRICTIONS....9
11. PREOPERATIONAL CHECKS BY THE BRIDGE TENDER AT....9
THE START OF EACH WORK SHIFT....9
12. AUTOMATIC OPERATION FROM THE CONTROL CONSOLE....10
13. MANUAL OPERATION FROM THE CONTROL CONSOLE....12
14. SINGLE SPAN MANUAL OPERATION FROM THE CONTROL CONSOLE....14
15. BRIDGE SPAN MANUAL OPERATION FROM THE PENDANT CONTROL....17
16. HALF SPEED OPERATION (HIGH WIND SPEED SWITCH)....20
17. OPERATION OF MACHINERY BRAKES FOR MAINTENANCE FROM THE CONTROL CONSOLE....20
18. OPERATION OF MOTOR BRAKES FOR MAINTENANCE FROM THE CONTROL CONSOLE....21
19. POST OPERATIONS INSTRUCTIONS....21
APPENDIX A: EMERGENCY INSTRUCTIONS....22
APPENDIX B: USE OF SIGNALS BY VESSEL OPERATORS & BRIDGE TENDERS 25
RECORDS....267
ROLES AND RESPONSIBILITIES....26
REFERENCE DOCUMENTS....30
ADDITIONAL RESOURCES....30
ACRONYMS....30

DEFINITIONS 30
REVISION RECORD 32
DOCUMENT APPROVALS 32

THIS INSTRUCTION DOES NOT CONTAIN HAZARDOUS OPERATIONS

PURPOSE

The purpose of this Instruction is to establish instructions for the methods of operating the Haulover Canal Bridge (HCB) at the Kennedy Space Center. This document also provides guidance for safe bridge operations and to protect employees from various hazards associated with bridge operations under the Base Operations and Spaceport Services (BOSS) Contract

SCOPE AND APPLICABILITY

This document provides step-by-step instructions to raise and lower (HCB) bascule spans according to established Martine Standards and operational requirements. This Instruction also provides preoperational and communication instructions for the performance of bridge maintenance work. Emergency instructions are also included.

PROCESS

1. PERSONAL AND OPERATIONAL HAZARDS

1) Personal Hazards

a. All work shall be performed in accordance with the requirements of KNPR 8715.3, “KSC Safety Procedural Requirements”.

b. Adverse weather conditions (high winds, lightning, heavy rain): all personnel at the bridge shall comply with Procedure SMA-EMP, “Emergency Management Plan”.

c. Electrical hazards. All electrical work shall be performed in accordance with Procedure SHP-P-0303, “Electrical Safety”.

d. Working in dark conditions.

2) Operational Hazards

a. If requirements contained in this document and reference documents are not followed, relating to bascule span operations, then possible damage to major mechanical and/or electrical components could occur. It is required that all defined requirements be followed.

2. SAFETY EQUIPMENT

1) Personal Protective Equipment (PPE)

a. Personnel performing bridge maintenance or inspection operations must wear or utilize the following PPE when required as specified in Procedure SHP-P-0132, “Personal Protective Equipment”:

i. Personal Flotation Equipment.

1. A USCG – approved Type II “classic” Personal Flotation Device (PFD) or Type I PFD is required.
2. One (1) USCG Type IV (throwable) Ring Buoy with Reflective Tape attached with 90 feet of nylon rope.

b. Roadway safety vest, ANSI 107-2010 Class 2 compliant- approved. .

c. Safety glasses with side shields.

d. Footwear - low-heeled, closed toe, nonporous safety shoes made of leather or equivalent, with soles heavy enough and of appropriate composition to provide adequate foot protection in accordance with all commodity Safety Data Sheets (SDS) and work environment. .

e. Rain Gear.

2) Additional Safety Equipment

a. Flashlights.

b. Binoculars.

c. VHF radio.

D. Anemometer (Wind meter).

E. Fire Extinguisher.

3) ESSENTIAL PERSONNEL

Supervision is responsible to verify personnel are properly trained, OJT certified qualified, and only certified personnel operate the bridge. Supervision shall ensure operations are performed safely according to approved procedures.

1) Operating Personal Located at the Bridge

a. Bridge Tender – 1 (minimum required).

2) Monitoring Personnel Located at the Bridge

a. Supervisor or Lead - 1 (optional).

b. Engineer - 1 (optional)

4) BRIDGE OPERATION RECORDS

1) The following table contains a listing of records related to the operation of the bridge that must be maintained as described:

BRIDGE OPERATION RECORDS				
Form Number	**Title Of Bridge Record**	**Location Of Bridge Record**	**Purpose Of Bridge Record**	**Record Storage**
KSC Form 28-1061 NS	"Report of Drawbridge Openings, Kennedy Space Center"	Paper originals of the completed forms shall be maintained at the bridge site in the Control Tower in labeled binders.	The completion of this form for all drawbridge openings is a Contract requirement. The content of this form provides NASA, thee Contract and the U.S. Coast Guard information pertaining to the type and identification of vessels that have passed through the bridge opening and provides an understanding of the vessel traffic volumes during the various seasons of the year. Bridge openings during maintenance operations are not to be recorded on this form or in the Log Book.	a. The records shall remain at the bridge Control Tower. Upon request, the Lead Bridge Tender, or Designee, shall provide the records to the Bridge Tender Supervisor, who shall coordinate with the appropriate Records Custodian for proper storage, disposal and/or archiving. b. Records shall be made available to NASA or the U.S Coast Guard upon request.
FAM-F-2020	"Bridge Tender Shift Change Checklist"	Paper originals of the completed forms shall be maintained at the bridge site in the Control Tower in labeled binders.	This form shall be completed jointly by the off-going and oncoming Bridge Tenders and includes a review of logs, noting any unresolved problems or unusual conditions; verification that bypass switches are properly sealed and a lighting inspection.	a. The records shall remain at the bridge Control Tower. Upon request, the Lead Bridge Tender, or Designee, shall provide the records to the Bridge Tender Supervisor, who shall coordinate with the appropriate Records Custodian for proper storage, disposal and/or archiving. b. Records shall be made available to NASA or the U.S Coast Guard upon request.
(no form number)	Bridge Log Book for Visitor's and Events.	A bound Bridge Log Book for Visitor's and Events shall be kept in the Control Tower.	The Log Book has the following functions: a) Provides a list of all personnel who have visited the bridge and are currently at the bridge site. The Log Book shall be completed by all visitors' at the bridge. b) Provides a tool that documents events that have occurred at the bridge. The Log is helpful	a. The records shall remain at the bridge Control Tower. Upon request, or when the Log Book is full or requires replacement due to wear and tear, the Lead Bridge Tender, or Designee, shall provide the records to the Bridge Tender Supervisor, who shall coordinate with the appropriate Records Custodian for proper storage, disposal and/or archiving.

BRIDGE OPERATION RECORDS				
Form Number	**Title Of Bridge Record**	**Location Of Bridge Record**	**Purpose Of Bridge Record**	**Record Storage**
			for Bridge Tender shift changes to document anomalies, maintenance or other items that are important to be communicated to the oncoming Bridge Tender. The Log shall be maintained by the Bridge Tender. The information contained in the Log also serves as a reference tool utilized by the Bridge Maintenance Crew and Bridge System Engineer during troubleshooting operations.	b. Records shall be made available to NASA or the U.S Coast Guard upon request.
FDOT form 850-010-20	Florida Department of Transportation form, "Bridge Tender's Report on Unnecessary Bridge Opening and/or Unauthorized Approach of Vessel"	Paper originals of the completed forms shall be maintained at the bridge site in the Control Tower in labeled binders.	This form shall be completed by the Bridge Tender whenever a vessel owner or operator violates the requirements of 33 CFR 117.11, "Unnecessary Opening of the Draw", which states that *"No vessel owner or operator shall - (a) Signal a drawbridge to open if the vertical clearance is sufficient to allow the vessel, after all lowerable nonstructural vessel appurtenances that are not essential to navigation have been lowered, to safely pass under the drawbridge in the closed position; or (b) Signal a drawbridge to open for any purpose other than to pass through the drawbridge opening."*	a. The Lead Bridge Tender, or Designee, shall forward the completed record to the Bridge Tender Supervisor immediately after each occurrence. The Bridge Tender Supervisor shall immediately coordinate with the appropriate Records Custodian regarding forwarding of the completed form to the U.S. Coast Guard for processing and communication with the vessel owner – and for proper storage, disposal and/or archiving of records. b. Records shall be made available to NASA upon request.

5. GENERAL INSTRUCTIONS FOR BRIDGE OPERATIONS

1) Prior to any span movement the Bridge Tender, or designated OJT certified operator, shall know the location of all onsite personnel and verify all personnel and equipment are clear of moving machinery.

2) Bridge tender shall promptly fully open bridge spans for vessel(s) Passage when request or signal to open is given in accordance with 33 CFR 117, Subpart A. All requesting and acknowledgment signals for bridge openings given by the Bridge Tender and the Operator of the vessel operator shall be in accordance with 33 CFR 117.15 and Appendix “B” of this Instruction.

3) Any deviation from the requirements that are defined in this document which increases the hazard level or alters any safety requirements must be approved by Quality, Safety, & Environmental (QSE) prior to the start of the hazardous sequence or entry into the elevated hazard steps/sequence.

4) Report all equipment/system failures or anomalies to the Bridge Tender Supervisor and Duty Office.

6. CONTROL CONSOLE BYPASS SWITCHES

1) Use of Control Console Bypass Switches During Bridge Maintenance Operations

    a. Do not use any by-pass switches unless directed by the Bridge Maintenance Supervisor or Bridge System Engineer. The use of these by-pass switches during maintenance operations without the appropriate approval and/or oversight may result in unexpected and unsafe bridge movements and could also result in damage to mechanical and/or electrical bridge components.

2) Use of Control Console Bypass Switches During Normal Bridge Operations

    a. Do not use any by-pass switches located on the control console during normal operations, unless directed by the Bridge Maintenance Supervisor, or Bridge System Engineer.

7. BRIDGE MAINRENANCE WORK

1) Prior to starting any bridge maintenance work, the Bridge Maintenance Lead shall perform a Job Hazard Analysis (JHA).

2) The Task Lead shall verify personnel are certified, have required PPE, have received a pre-task briefing and reviewed the Job Hazard Analysis and are ready to proceed with the work.

3) Bridge Movement During Maintenance

a. During bridge maintenance operations, when a bridge span is to be raised or lowered to accommodate work, the standard procedure shall be for the Bridge Tender to operate the bridge from the control console in “MANUAL” mode. At the discretion of the Bridge Crew Maintenance Supervisor or designated personnel, a qualified bridge crew member may be designated to operate the bridge from the “pendant”.

8. BRIDGE MAINTENANCE COMMUNICATION

1) Bridge Maintenance Crew shall bring the following to the site:
    a. Two–way radios (2 minimum) – one for the Bridge Tender and one for the Bridge Maintenance Lead. Additional radios shall be brought and utilized as needed – based on the extent and location of maintenance work.
2) Bridge Crew Lead shall, before starting any work, go to the Control Tower and perform the following:
    a. Sign in and record, in the Bridge Tender’s logbook, the scope of the planned maintenance work.
    b. Verify that the red sign is placed on the control console, in direct view of the Bridge Tender, at all times during bridge maintenance operations. The sign must include the following instructions:
        i. STOP. WHAT IS THE BRIDGE CONFIGURATION?
        ii. WHAT IS THE REQUESTED MOVEMENT?
        iii. VERIFY CONSOLE LIGHT INDICATIONS?
        iv. VERIFY SAFE TO OPERATE.
    c. Provide a 2-way radio to the Bridge Tender for continuous radio communication between the Bridge Maintenance Crew and the Bridge Tender.
    d. Review the following with the Bridge Tender:
        i. The Work Order and a summary of the planned maintenance work.
        ii. The Job Hazard Analysis (JHA) form.
        iii. The content and purpose of the red sign described in Section 8.2.2.
        iv. The required bridge operations, especially procedural restrictions regarding the use of bypass switches defined in Section 6 and other locations in this document.
3) All communication between the Bridge Maintenance Crew and the Bridge Tender shall be by 2-way radio using the “**command response**” communication method - for all instructions related to the movement of bridge spans, lock bars, brakes, traffic gates and signals and all other bridge-related components and functions.

9. QUALITY INSPECTION REQUIREMENTS

Not required.

10. OPERATION RESTRICTIONS

1) Normal Restrictions

   a. None. The Haulover Canal Bridge opens on signal at all times.

2) Launch Restrictions

   a. Typically, there are no restrictions applied to the operation of the Haulover Canal Bridge when a launch is scheduled from either Kennedy Space Center or Cape Canaveral Air Force Station. If a specific launch requires bridge operation restrictions, the Mission Support Office will provide the restrictions to FSEU/Facilities Maintenance.

3) Operational Malfunctions

   a. Notify Supervision and proceed as directed.

   b. If Supervision is unavailable, notify the Contract's Bridge System Engineer.

   c. Notify the JSTC Console at 321-861-5464.

   d. Notify the Spaceport Integration Center (SIC) at 321-861-5050.

   e. If unable to operate the bridge for maritime vessels, notify the United States Coast Guard at 321-868-4200.

   f. Wait for the Bridge Maintenance Team to arrive if malfunction cannot be resolved over the phone.

11. PREOPERATIONAL CHECKS BY THE BRIDGE TENDER AT THE START OF EACH WORK SHIFT

The following preoperational checks are to be performed by the Bridge Tender at the start of each work shift. Perform the checks additional times during each shift, as necessary, or as directed by Supervision.

1) 11.1 Jointly, with the off-going Bridge Tender, complete form FAM-F-2020, "Bridge Tender Shift Change Checklist".

2) 11.2 Check for any damage to the fender system, including walkways that may have occurred, but was not observed, during the previous shift.

3) 11.3 Located in the roadside equipment room, on the Motor Control Center (MCC), on the north wall of the equipment room.
   a. Verify that all the "HAND-OFF-AUTO" switches are in the "AUTO" position.

   b. Verify that all disconnects are on/closed (the handle is in the up position).

c. Check the indicator lights on the Motor Control Center, press the "PUSH-TO-TEST" light on each bucket to verify proper operation.

4) Located in the roadside equipment room on the south wall.

a. Verify that the 2-span motor 60 amp circuit breakers are on/closed (the handle is in the up position). These are located next to each variable frequency drive.

b. Verify that the variable frequency drives are powered “on”, the display should be illuminated.

5) Located in the roadside equipment room, verify that all breakers in all panels are on/closed, unless otherwise noted by LOTO or Danger Tags.

6) Before opening the structure for any seagoing vessel, physically inspect all traffic signal lights, gate flasher lights and traffic gongs to verify proper operation by performing the following:

a. Turn the "CONTROL POWER" switch to "MANUAL".

b. Press the "BEGIN RAISE SEQUENCE" button momentarily.

c. Verify that the traffic signal lights, gate flasher lights and traffic gongs are functioning properly.

d. Press the square "STOP" button momentarily, turn the ‘CONTROL POWER” switch back to the “OFF” position.

7) Verify proper operation of the bridge navigational lights by performing the following:

a. Turn the "CONTROL POWER" switch to "MANUAL".

b. Turn the "NAVIGATIONAL LIGHT" switch from "AUTO" to "MANUAL" to switch lights from red to green.

c. Verify that the bridge navigational lights are functioning properly.

d. Turn the ‘CONTROL POWER” switch back to the “OFF” position.

e. Report discrepancies per SHP-P-0911, “Incident Investigation”.

8) Verify proper operation of the marine radio. Report discrepancies per SHP-P-0911.

12. AUTOMATIC OPERATION FROM THE CONTROL CONSOLE

12.1. Preoperational Checks Prior to Each Bridge Opening

1) Verify that all preoperational checks required to be performed by the Bridge Tender at the start of the work shift, which are defined in Section 11, have been successfully completed and all systems are set and functioning properly.

2) Verify that all bypass switches on the control console are locked in the off (not activated) position. (Refer to Section 6 of this document for limitations that pertain to the use of the control console bypass switches.)
3) Momentarily press the "LAMP TEST" button located on the control console to verify that the processor is running.
4) Located on the control console, verify that the "CONTROL POWER SWITCH" is in the "AUTO" position.
5) Verify that the following indicator lights on the control console are illuminated green. These indicator lights are:
    a. Motor Brakes .....Set
    b. Machinery Breaks .....Set
    c. On-Coming and Off-Going gates are ..... UP
    d. Span Locks are .....Driven
    e. Traffic Signal Lights ..... Green
    f. Spans are fully .....Seated
6) Put the "CONTROL POWER SWITCH" is in the "AUTO" position.
7) Verify the following switch positions located on the control console:
8) The "EMERGENCY STOP" switch is raised. This is a push/pull type switch.
9) The "WIND CONDITION SPEED" switch is in the "NORMAL" position, under normal conditions.
10) The "NAVIGATIONAL LIGHTS" switch is in the "AUTO" position.
11) Verify that all personnel at the bridge site are aware that both Bascule spans are about to be raised.

12.2. Raising the Bridge

1) The following steps are only to be performed when the preoperational checks, listed in Sections 11 and 12.1 have been successfully completed.
2) Verify that all bypass switches on the control console are locked in the off (not activated) position.
3) Momentarily press the "BEGIN RAISE SEQUENCE" button. This will cycle/change the traffic lights to red; the gate light flashers will start, and the roadway gongs will sound.
4) Before executing the next step, always check for oncoming vehicular traffic.
5) Located on the control console:
    a. Lower the oncoming gates at the far and near sides by pressing and holding the "DOWN" buttons.

a. Lower the off-going gates on the far and near sides by pressing and releasing the "DOWN" buttons.

b. Located on the control console, momentarily press the "RAISE" button. The lock bars will automatically pull, the horn will sound, and the spans will begin to raise.

12.3. Lowering the Bridge

1) Verify that all personnel in the area are aware that both Bascule spans are about to be lowered.
2) Verify that all bypass switches on the control console are locked in the off (not activated) position.
3) Momentarily press the "BEGIN LOWER SEQUENCE" button.
4) After the warning horn has automatically sounded five times, momentarily press the "LOWER" button located on the control console.
5) After the spans are fully-seated, locks driven, all gates are up, and the traffic lights have switched off, verify that the following indicator lights on the console are illuminated green. These indicator lights are:
    a. Motor Brakes .....Set
    b. Machinery Breaks .....Set
    c. On-Coming and Off-Going gates are .....UP
    d. Span Locks are .....Driven
    e. Traffic Signal Lights .....Green
    f. Spans are fully .....Seated
6) Put the "CONTROL POWER SWITCH" to the "OFF" position.
7) The on-duty Bridge Tender shall document the bridge opening and closing, ship identification and other information by completing KSC Form 28-1061 NS.

13. MANUAL OPERATION FROM THE CONTROL CONSOLE

13.1. Preoperational Checks Prior to Each Bridge Opening

1) Verify that all preoperational checks in section 11 have been completed.
2) Verify that all bypass switches on the control console are locked in the off (not activated) position.
    a. Reference Section 6 for the use of the control console bypass switches.
3) Momentarily press the “LAMP TEST” button located on the control console to verify that the processor is running.
4) Put the “CONTROL POWER SWITCH” is in the “MANUAL” position.

5) Verify that the following indicator lights on the control console are green. These indicator lights are:
    a. Motor Brakes .....Set
    b. Machinery Brakes .....Set
    c. On-Coming and Off-Going gates ..... Up
    d. Span Locks .....Driven
    e. Traffic Signal Lights ..... Green
    f. Spans are fully .....Seated
6) Verify the following switch positions located on the control console:
    a. The “EMERGENCY STOP” switch is raised. This is a push/pull type switch.
    b. The “WIND CONDITION SPEED” switch is in the “NORMAL” position, under normal conditions.
    c. The “NAVIGATIONAL LIGHTS” switch is in the “AUTO” position.
7) Verify that all personnel in the area are aware that the Bascule spans are about to be raised.

13.2. Raising the Bridge:

1) The following steps are only to be utilized when the preoperational checks listed in Sections 11 and 13.1 have been successfully completed.
2) Press the “BEGIN RAISE SEQUENCE” button. This will cycle/change the traffic lights to red, the gate light flashers will start, and the roadway gongs will sound.
3) Before executing the next step, always check for oncoming vehicular traffic.
4) On the control console:
    a. Lower the oncoming gates on the far and near sides by pressing and holding the “DOWN” buttons.
    b. Lower the off-going gates on the far and near sides by pressing and releasing the “DOWN” buttons.
5) Momentarily press the span locks “PULLED” button. The lock bars will pull.
6) Confirm that the red indicator light for the two span locks “PULLED” buttons are illuminated.
7) Press the “HORN” button one long blast and one short blast.
8) Momentarily press the “RAISE” button. The spans will begin to move.
9) When the span reaches the fully raised position, it will automatically stop, and the span navigational lights will change from red to green.

13.3. Lowering the Bridge:

1) Verify that all personnel in the area are aware that the Bascule spans are about to be lowered.
2) Verify that all bypass switches on the control console are locked in the off (not activated) position.
3) Press the “BEGIN LOWER SEQUENCE” button.
4) Press the “HORN” button five short blasts.
5) After the warning horn has sounded, momentarily press the “LOWER” button.
6) After the spans are fully seated, momentarily press the two span locks “DRIVEN” buttons.
7) Confirm that the green indicator lights for the two span locks “DRIVEN” buttons are illuminated.
8) After the span locks are driven:
    a) Raise the off-going gates on the far and near sides by momentarily pressing the two “UP” buttons.
    b) After the off-going gates have been raised, raise the oncoming gates on the far and near sides by momentarily pressing the two “UP” buttons.
9) The traffic lights will automatically switch from red to green. Verify that the following indicator lights on the console are illuminated green.
    a) Motor Brakes……Set
    b) Machinery Brakes……Set
    c) On-Coming and Off-Going gates……Up
    d) Span Locks……Driven
    e) Traffic Signal Lights……Green
    f) Spans are Fully……Seated
10) Place the “CONTROL POWER” switch to the “OFF” position.
11) The on-duty Bridge Tender shall document the bridge opening and closing, ship identification and other information by completing KSC Form 28-1061 NS.

14. SINGLE SPAN MANUAL OPERATION FROM THE CONTROL CONSOLE

14.1. Preoperational Checks Prior to Each Bridge Opening

1) Verify that all preoperational checks required to be performed by the Bridge Tender at the start of the work shift, which are defined in Section 11, have been successfully completed and all systems are set and performing properly.
2) Refer to Section 6 of this document for limitations that pertain to the use of the control console bypass switches.
3) Verify that all bypass switches on the control console are locked in the off (not activated) position.

4) Momentarily press the “LAMP TEST” button located on the control console to verify that the processor is running.

5) Located on the control console, verify that the “CONTROL POWER” switch is in the “MANUAL” position.

6) Verify that the following indicator lights on the console are green. These indicator lights are:

   a) Motor Brake…… Set

   b) Machinery Brakes…… Set

   c) On-Coming and Off-Going Gates…… Up

   d) Span Locks…… Driven

   e) Traffic Signal Lights…… Green

   f) Spans Fully……... Seated

7) Verify the following switch positions:

   a) The “EMERGENCY STOP” switch is raised. This is a push/pull type switch.

   b) The “WIND CONDITION SPEED” switch is in the “NORMAL” position, under normal conditions.

   c) The “NAVIGATIONAL LIGHTS” switch is in the “AUTO” position.

8) Verify that all personnel in the area are aware that a Bascule span is about to be raised.

14.2. Raising a Single Span

1) The following steps are only to be utilized when the preoperational checks listed in Sections 11 and 14.1 have been successfully completed.

2) Turn the “SPAN OPERATION” switch to the span you want to move – either the near or far span.

3) Press the “BEGIN RAISE SEQUENCE” button. This will cycle/change the traffic lights to red, the gate light flashers will start, and the roadway gongs will sound.

4) Before executing the next step, always check (in both Directions) for oncoming vehicular traffic.

5) Located on the control console:

   a) Lower the oncoming gates on the far and near sides by holding the “DOWN” buttons.

   b) After the oncoming gates have been lowered, lower the off-going gates on the far and near sides by pressing and releasing the “DOWN” buttons.

6) Momentarily press the span locks “PULLED” button. The lock bars will pull, then stop.

7) Confirm that the red indicator light for the span locks “PULLED” button is illuminated.
8) Located on the control console, press the “HORN” button one long blast and one short blast.
9) Momentarily press the “RAISE” button for the span that is to be raised. The span will begin to move.
10) Momentarily press the red square “STOP” button when the span has reached its desired position.

14.3. Lowering a Single Span:

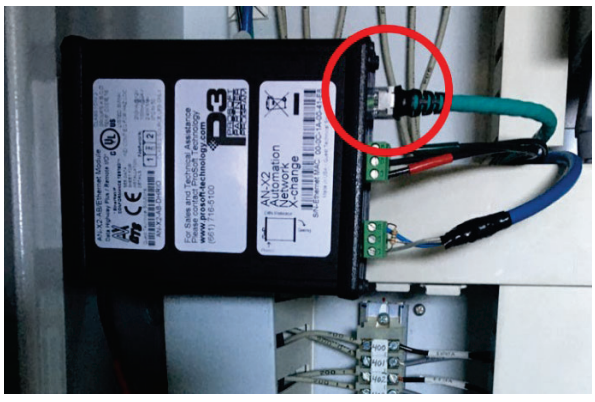
1) Verify that all personnel in the area are aware that a Bascule span is about to be lowered.
2) Verify that all bypass switches on the control console are locked in the off (not activated) position.
3) Press the “BEGIN LOWER SEQUENCE” button.
4) Press the “HORN” button five short blasts.
5) After the warning horn has sounded, momentarily press the “LOWER” button.
6) After the spans are fully seated, momentarily press the two span locks “DRIVEN” buttons.
7) Confirm that the green indicator lights for the two span locks “DRIVEN” buttons are illuminated.
8) Raise the off-going gates on the far and near sides by momentarily pressing the two “UP” buttons.
9) After the off-going gates have been raised, raise the oncoming gates on the far and near sides by momentarily pressing the two “UP” buttons.
10) After all gates are up, the traffic lights will automatically switch to green. Verify that the following indicator lights on the console are green. These indicator lights are:
    a) Motor Brakes.....Set
    b) Machinery Brakes .....Set
    c) Oncoming and Off-Going Gates..... Up
    d) Span Locks .....Driven
    e) Traffic Signal Lights..... Green
    f) Spans fully.....Seated
11) Place the “SPAN OPERATION” switch to the “AUTO” position.
12) Place the “CONTROL POWER SWITCH” to the “OFF” position.
13) The on-duty Bridge Tender shall document the bridge opening and closing, ship identification, etc. by completing KSC Form 28-1061 NS.

15. BRIDGE SPAN MANUAL OPERATION FROM THE PENDANT CONTROL

15.1. Preoperational Checks

1) Machinery Areas at Near and Far Sides
   a) Verify that all local disconnect switches are on/closed for the near and far side span motors and brakes (machinery and motor).
   b) Verify all brakes (machinery and motor) are “set” and not hand released.
   c) Remove all foreign objects that could become entangled in gearing and drive shaft of the bascule spans.
   d) Verify that emergency drive system is not engaged.
2) Roadway Equipment/Motor Control Center (MCC) Room
   a) On the MCC, press the “PUSH-TO-TEST” light on the machinery and motor brakes buckets to verify proper operation of control voltage.
   b) On the MCC, set the “HAND-OFF-AUTO” switches for the machinery and motor brakes to the “HAND” position.
   c) On the MCC, verify that the disconnect switch for the variable frequency drive, machine brake, and motor brake buckets are on/closed (the handle is in the up position).
   d) On the MCC: verify all breakers are in the on/closed position for all panels, unless otherwise noted.
3) Roadway Equipment/Drive Room
   a) Verify that the span motor 60-amp circuit breaker is on/closed (handle in up position), located on the south wall next to each drive.
   b) Verify the drive unit display is “ON” (power applied), located on the south wall.
   c) Open gray enclosure on west wall, Unplug the Remote IO cable (Green) network communication cable connected to the AN-X2 module (black box) located at the lower left side of the panel (see fig 1 cable is in red circle).

Fig 1 Showing Comm Cable



d) Located on the MCC, at the cubical labeled 1FB, select the span and drive to be operated.

e) Located on the MCC, at the cubical labeled “REMOTE CONTROLLER”, remove pendant operator.

15.2. Raising a Span

1) Extreme caution shall be used when performing this procedure. There are no limit switches or safeties to stop the structure/bridge from movement.
2) Always keep your hand on the “STOP” button of the pendant operator while moving the structure/bridge.
3) Verify the preoperational checks listed in Section 15.1 have been completed.
4) Verify all gates are “DOWN” and traffic lights are “RED”.
5) Verify that the span locks are “PULLED” by verifying the following:
    a. The red span lock “PULLED” indicator light must be on.
    b. Walk to mid-span of the bascule leaf and visually confirm that both span locks are PULLED; OR
    c. Utilizing 2-way radios, obtain confirmation from the Bridge Maintenance Crew Supervisor, or designated Lead, for visual confirmation that the span locks have completely retracted.
6) Yell “ALL CLEAR”. Ensure all personnel are aware that a Bascule span is about to move and clear of moving machinery.
    a. If maintenance crew is on-site, utilizing 2-way radios, obtain confirmation that all personnel are clear, and it is safe to raise the span.
7) Verify the “RAISE/LOWER” switch is in the “RAISE” position on the pendant.
8) Turn the rheostat to the fully “COUNTERCLOCKWISE / SLOW” position on the pendant.
9) Position yourself so you can see the span.
10) Drive unit display will read positive in the raise direction.
11) Press the “START” button. The span will begin to move.
12) Verify the span is moving in the raise direction. If not, press the “STOP” button.
13) Turn the rheostat clockwise to increase the speed. Full speed is 60 Hz on the drive unit display.
14) Turn the rheostat to the fully “SLOW” position at approximately 30 feet from the fully raised position. The drive will ramp down to + 5 Hz in 10 seconds.
15) When the span is fully raised, press the “STOP” button on the pendant operator.
16) Repeat the process for the remaining span to be raised.

15.3. Lowering a Span

1) Extreme caution shall be used when performing this procedure. There are no limit switches or safeties to stop the structure/bridge from movement.
2) Always keep your hand on the “STOP” button of the pendant operator while moving the structure/bridge.
3) Verify the preoperational checks in Section 15.1 have been completed.
4) Yell “ALL CLEAR”. Verify that all personnel are aware that a Bascule span is about to move and clear of moving machinery.
5) If maintenance crew is on-site, Utilizing 2-way radios, obtain that all personnel are clear of moving machinery and it is safe to lower the span.
6) Verify that the “RAISE/LOWER” switch is in the “LOWER” position on the pendant.
7) Turn the rheostat to the fully “COUNTERCLOCKWISE / SLOW” position on the pendant.
8) Position yourself so you can see the span.
9) Drive unit display will read negative in the lower direction.
10) Press the “START” button. The span will begin to move.
11) Verify the span is moving in the down direction. If not, press the “STOP” button.
12) Turn the rheostat clockwise to increase the speed. Full speed is 60 Hz on the drive unit display.
13) Turn the rheostat to the fully “SLOW” position at approximately 30 feet from fully seated. The drive will ramp down to – 5 Hz in 10 seconds.
14) When the span is fully seated, press the “STOP” button on the pendant operator.
15) Repeat the process for the remaining span to be lowered.
16) Set sector switch to drive span lock-bars.
    a. Verify that the span locks are “driven” by verifying the following:
    b. The green span lock “Driven” indicator light must be on.
    c. Walk to mid-span of the bascule leaf and visually confirm that both span locks are Driven, fully engaged; OR
    d. Utilizing 2-way radios, obtain confirmation from the Bridge Maintenance Crew Supervisor, or designated Lead, for visual confirmation that the span locks are fully Driven, fully engaged.
17) The on-duty Bridge Tender shall document the bridge opening and closing, ship identification, etc. by completing KSC Form 28-1061 NS.

16. HALF SPEED OPERATION (HIGH WIND SPEED SWITCH)

NOTE:

The “WIND CONDITION SPEED” switch is located near the center of the control console. This switch will function in AUTO or MANUAL to reduce the full operating speed of the span in half (From normal 60 hz to 30 hz). During any point of the actual bridge operation or even at the beginning of the sequence, the half speed switch can be activated.

NOTE:

The drawbridge shall operate at half speed during sustained wind conditions of 25 knots or greater and/or when the operator deems necessary.

1) Place the “CONTROL POWER” switch on the control console to either the “MANUAL” or “AUTO” position.

2) Verify that all bypass switches on the control console are locked in the off (not activated) position.

3) Turn the “WIND CONDITION SPEED” switch to the “HALF SPEED” position. The console will sound, warning the operator of the action. Acknowledge the alarm by pressing the black button directly below the blinking red “ALARM ACK” console indicator lamp.

4) To return to normal operation, turn the “WIND CONDITION SPEED” switch to the “NORMAL” position.

17. OPERATION OF MACHINERY BRAKES FOR MAINTENANCE FROM THE CONTROL CONSOLE

1) Place the “CONTROL POWER” switch on the control console to the “MANUAL” position.

2) Verify that all bypass switches on the control console are locked in the off (not activated) position.

1. **NOTE:**

ii. Refer to Section 6 of this document for limitations that pertain to the use of the control console bypass switches.

3) Place the “MAINTENANCE” switch to the “TEST” position. This switch is located at the upper right of the front vertical panel of the control console, above the “muffin” fan.

4) Momentarily press the machinery brake “RELEASE” button. The brake will release, as indicated by the illumination of the red indicator light on the control console.

5) Momentarily press the machinery brake “SET” button. The brake will set, as indicated by the illumination of the green indicator light on the control console.

6) To return to the original configuration, turn the “MAINTENANCE” and the “CONTROL POWER” switches to the “OFF” position.

18. OPERATION OF MOTOR BRAKES FOR MAINTENANCE FROM THE CONTROL CONSOLE

1) Place the “CONTROL POWER” switch on the control console to the “MANUAL” position.

2) Verify that all bypass switches on the control console are locked in the off (not activated) position.

1. **NOTE:**

Refer to Section 6 of this document for limitations that pertain to the use of the control console bypass switches.

3) Place the “MAINTENANCE” switch to the “TEST” position. This switch is located at the upper right of the front vertical panel of the control console, above the “muffin” fan.

4) Momentarily press the motor brake “RELEASE” button. The brake will release, as indicated by the illumination of the red indicator light on the control console.

5) Momentarily press the motor brake “SET” button. The brake will set, as indicated by the illumination of the green indicator light on the control console.

6) To return to the original reconfiguration, turn the “MAINTENANCE” and the “CONTROL POWER” switches to the “OFF” position.

19. POST OPERATIONS INSTRUCTIONS

19.1. Maintain appropriate records

1) The on-duty Bridge Tender shall document the bridge opening and closing, ship identification, etc. onto KSC Form 28-1061 NS.

APPENDIX A: EMERGENCY INSTRUCTIONS

1. Fire

a. Evacuate nonessential personnel.

b. Terminate operations by pushing the "SHUNT TRIP" button. This will cut electrical power to the bridge.

NOTE:

The "SHUNT TRIP" button is located on the control console. It is red and shaped like a mushroom with the words "SHUNT TRIP" engraved on it. This is a push/pull type of switch operation.

c. Evacuate the area.

d. Notify the appropriate KSC control center by dialing the following numbers: if using a KSC landline phone, dial 911. If using a cell phone, dial 321-867-7911. Request fire, ambulance, or security support as needed.

e. Notify Supervision and proceed as directed.

f. Assist Fire Department personnel, if properly trained, as requested by the Fire Chief.

2. Vehicle Accident

a. Notify the appropriate KSC control center by dialing the following numbers: if using a KSC landline phone, dial 911. If using a cell phone, dial 321-867-7911. Request fire, ambulance, or security support as needed.

b. Notify Supervision and proceed as directed.

3. Personnel Injury

a. Immediately terminate operations, if this can be accomplished safely. Turn off all power and, if necessary and capable, remove victim to administer first aid.

b. If breathing has stopped, administer CPR (if certified to do so) until voluntary respiration resumes or medical help arrives.

c. Notify the appropriate KSC control center by dialing the following numbers: if using a KSC landline phone, dial 911. If using a cell phone, dial 321-867-7911. Request fire, ambulance, or security support as needed.

d. Notify Supervision and proceed as directed.

4. Drawbridge Operations for Emergency Vehicles and Emergency Vessels (33 CFR 117.31)

a. When a Bridge Tender is informed by a reliable source that an emergency vehicle is due to cross the bridge, the Bridge Tender shall take all reasonable

measures to have the draw bridge closed at the time the emergency vehicle arrives at the bridge.

b. When the Bridge Tender receives notice, or a proper signal as provided in 33 CFR 117.15, the Bridge Tender shall take all reasonable measures to have the draw bridge opened, regardless of the operation schedule of the drawbridge, for passage of the following, provided this opening does not conflict with local emergency management procedures which have been approved by the cognizant U.S. Coast Guard captain of the Port:

   i. Federal, state, and local government vessels used for public safety.

   ii. Vessels in distress where a delay would endanger life or property.

   iii. Commercial vessels engaged in rescue or emergency salvage operations.

   iv. Vessels seeking shelter from severe weather.

5. Closure of a Drawbridge for Natural Disasters or Civil Disorders (33 CFR 117.33)

a. Drawbridges need not open for the passage of vessels during periods of natural disasters or civil disorders declared by the appropriate authorities unless otherwise provided for in Subpart B of 33 CFR 117 or unless directed to do so by the U.S. Coast Guard District Commander.

APPENDIX B: USE OF SIGNALS BY VESSEL OPERATORS & BRIDGE TENDERS

The following are the required signals to be used by marine vessel operators requesting a drawbridge opening and bridge tenders acknowledging requests by vessel operators per 33 CFR 117.15 - Navigation and Navigable Waters/Drawbridge Operation Regulations/Signals:

1. General:
    a. The operator of each vessel requesting a drawbridge to open shall signal the bridge tender and the bridge tender shall acknowledge that signal. The signal shall be repeated until acknowledged in some manner by the bridge tender before proceeding.
    b. The signals used to request the opening of the drawbridge and to acknowledge that request shall be sound signals, visual signals, or radiotelephone communications as described in this Appendix.
    c. Any of the means of signaling described in this Appendix sufficient to alert the party being signaled may be used.

2. Sound signals:
    a. Sound signals shall be made by whistle, horn, megaphone, hailer, or other device capable of producing the described signals loud enough to be heard by the bridge tender.
    b. As used in this Appendix, ‘‘prolonged blast’’ means a blast of four to six seconds duration and ‘‘short blast’’ means a blast of approximately one second duration.
    c. The sound signal to request the opening of a drawbridge is one prolonged blast followed by one short blast sounded not more than three seconds after the prolonged blast. For vessels required to be passed through a drawbridge opening during a scheduled closure period, the sound signal to request the opening of the drawbridge during that period is five short blasts sounded in rapid succession.
    d. When the drawbridge can be opened immediately, the sound signal to acknowledge a request to open the draw is one prolonged blast followed by one short blast sounded not more than 30 seconds after the requesting signal.
    e. When the drawbridge cannot be opened immediately, or is open and shall be closed promptly, the sound signal to acknowledge a request to open the drawbridge is five short blasts sounded in rapid succession not more than 30 seconds after the vessel’s opening signal. The signal shall be repeated until acknowledged in some manner by the requesting vessel.

3. Visual signals:
    a. The visual signal to request the opening of a drawbridge is the following:
        i. A white flag raised and lowered vertically; or
        ii. A white, amber, or green light raised and lowered vertically.
    b. When the drawbridge can be opened immediately, the visual signal to acknowledge a request to open the draw, given not more than 30 seconds after the vessel's opening signal, is the following:
        i. A white flag raised and lowered vertically;
        ii. A white, amber, or green light raised and lowered vertically; or
        iii. A fixed or flashing white, amber, or green light or lights.
    c. When the drawbridge cannot be opened immediately, or is open and must be closed promptly, the visual signal to acknowledge a request to open the draw is the following:
        i. A red flag or red light swung back and forth horizontally in full sight of the vessel given not more than 30 seconds after the vessel's opening signal; or
        ii. A fixed or flashing red light or lights given not more than 30 seconds after the vessel's opening signal.
    d. The acknowledging signal when the drawbridge cannot open immediately or is open and must be closed promptly shall be repeated until acknowledged in some manner by the requesting vessel.

4. Radio telephone communications:
    a. Radiotelephones may be used to communicate the same information provided by sound and visual signals.
    b. The vessel and the bridge tender shall monitor the frequency used until the vessel has cleared the draw.
    c. When radiotelephone contact cannot be initiated or maintained, sound or visual signals under this section shall be used.

RECORDS

The following records are retained by the organizations listed below:

Record	Responsible Organization
Bridge Control Console Data (no form number)	FSEU/Facilities Maintenance
Bridge Log Book for Visitor's and Events (no form number)	FSEU/Facilities Maintenance
FAM-F-2020, "Bridge Tender Shift Change Checklist"	FSEU/Facilities Maintenance
FDOT form 850-010-20, Florida Department of Transportation form, "Bridge Tender's Report on Unnecessary Bridge Opening and/or Unauthorized Approach of Vessel"	FSEU/Facilities Maintenance
KSC Form 28-1061 NS, "Report of Drawbridge Openings Kennedy Space Center"	FSEU/Facilities Maintenance

ROLES AND RESPONSIBILITIES

Program Manager: Ensures Contract compliance to the requirements stated in this Instruction. Reviews and approves or disapproves waiver requests written against this standard.

Division Manager: Ensures compliance within the Division to the requirements stated in this procedure.

Branch Manager: Ensures compliance at the branch level to the requirements stated in this procedure.

Supervisor of Bridge Tenders:

- Ensure that operational instructions and reference documents as described in this document are reviewed, understood and followed by all Bridge Tenders.
- Ensure that only properly trained and qualified personnel participate in operating the bridge and other potentially hazardous operations. Ensure that all required training and certifications are kept current.
- Ensure that all Bridge Records are completed and provided to the Contract's Bridge Records Custodian as defined in Section 4 of this document.

Lead Bridge Tender:

- Ensure that operational instructions and reference documents as described in this document are reviewed, understood and followed by all Bridge Tenders.
- Provide all completed forms and Log Books to the ISC Bridge Tender Supervisor as described in Section 4 of this document.

Bridge Tenders:

Follow all operational requirements that are defined in this document. The following list is provided to highlight some of the requirements:

- Review, understand and follow the operational Instructions as described in this document.
- Obtain all required training and certifications prior to performing the work described in this Instruction.
- Use the appropriate PPE as required for the type of work described in this Instruction.
- Complete all forms and Log Books as defined in Section 4 of this document.
- Perform the required preoperational checks at the start of each work shift as described in this Instruction. Perform the checks additional times during each shift, as necessary, or as directed by Supervision.
- Perform the required preoperational checks prior to each bridge opening – as described in this Instruction.
- Prior to raising or lowering a bridge span(s), it is required that the Bridge Tender, or the designated qualified operator, know the location of all personnel at the bridge site and must be certain that all personnel and equipment are clear.
- Understand the limitations that pertain to the use of the control console bypass switches – as described in this procedure.
- Review, understand and follow all the requirements described in this document pertaining to communication with the Bridge Maintenance Crew when they are on site to perform maintenance work.
- Review, understand and follow all the Operational Restrictions that are described in this Instruction.
- Review, understand and follow all the Emergency Instructions that are described in this Instruction.

Supervisor of the Bridge Maintenance Crew:

Follow all operational requirements that are defined in this document. The following list is provided to highlight some of the requirements:

- Ensure that operational instructions and reference documents as described in this document are reviewed, understood and followed by all Bridge Technicians.
- Ensure that all Bridge Technicians obtain all required training and certifications prior to performing the work described in this Instruction. Ensure that all required training and certifications are kept current.
- Ensure that Bridge Technicians use the appropriate PPE as required for the type of work described in this Instruction.
- Understand the limitations that pertain to the use of the control console bypass switches – as described in this procedure.
- For maintenance and repair work that requires the bridge or a roadway lane to be closed to vehicle traffic, the Bridge Maintenance Supervisor must take all of the actions that are defined in this instruction- to inform KSC, CCAFS, Brevard County and the other agencies defined in this Instruction.
- At the job site at the start of each work shift and prior to starting any bridge maintenance or repair work, the Bridge Maintenance Supervisor, or designated person, shall take the lead in performing a Job Hazard Analysis (JHA) in strict conformance with Procedure SHP-P-3100 – and as described in this Instruction.
- Ensure that communications between the Bridge Crew and the Bridge Tender are maintained as described in this Instruction.

Bridge Maintenance Crew Technicians:

- Review, understand and follow the operational instructions as described in this document.
- Obtain all required training and certifications prior to performing the work described in this Instruction.
- Use the appropriate PPE as required for the type of work described in this Instruction.

Bridge System Engineer:

- Maintain and update this Instruction to meet the requirements contained in all of the reference documents that are included in this Instruction.
- Provide troubleshooting assistance related to bridge operations - when help is requested by the Bridge Tender or the Supervisor (or Lead) of the Bridge Maintenance Crew.

Bridge Records Custodian:

- Archive all Bridge Records in accordance with current NASA and Contract requirements.

REFERENCE DOCUMENTS

The following documents are referenced in this procedure:

Document Number	Title
29 CFR 1926.106	Code of Federal Regulations, Title 29, Part 1926.106, "Working Over or Near Water"
33 CFR 117	Code of Federal Regulations, Title 33, Part 117, "Navigation and Navigable Waters/Drawbridge Operation Regulations"
FAM-F-2020	Bridge Tender Shift Change Checklist
KNPR 8715.3	KSC Safety Procedural Requirements
KSC Form 28-1061 NS	Report of Drawbridge Openings, Kennedy Space Center
MSI-I-0001	Master Schedule Integration Planning and Scheduling Instruction
MSI-REF-0001	Master Schedule Integration Planning and Scheduling Appendices
SHP-F-3100	Job Hazard Analysis Form
SHP-P-0132	Personal Protective Equipment
SHP-P-0242	Hand and Portable Power Tools
SHP-P-0303	Electrical Safety
SHP-P-0500	Fall Protection Program
SHP-P-0605	Water Safety
SHP-P-0911	Incident Investigation
SHP-P-3100	Job Hazard Analysis (JHA)
SMA-EMP	Emergency Management Plan

ADDITIONAL RESOURCES

The following documents are not referenced in this procedure, but are additional resources:

Document Number	Title
29 CFR 1910.145	Code of Federal Regulations, Title 29, Part 1910.145, "Specifications for Accident Prevention Signs and Tags"
SMA-F-0016A	Event Report Form
SMA-F-0016B	Near Miss Report Form
SMA-P-0016	Event and Near Miss Reporting
SMA-SHP	Safety & Health Plan

ACRONYMS

ANSI	American National Standards Institute
BOSS	Base Operations and Spaceport Services
CCAFS	Cape Canaveral Air Force Station
CFR	Code of Federal Regulations
DO	Duty Office
FSEU	Facilities, Systems, Equipment and Utilities
FDOT	Florida Department of Transportation
Hz	Hertz (cycles per second)
JHA	Job Hazard Analysis
KNPR	Kennedy NASA Procedural Requirements
KSC	Kennedy Space Center
LOTO	Lockout/Tagout
MCC	Motor Control Center
MSDS	Material Safety Data Sheet
NASA	National Aeronautics and Space Administration
OJT	On-the-Job Training
OM&E	Operations, Maintenance & Engineering
OMI	Operations and Maintenance Instruction
OSHA	Occupational Safety & Health Administration
PPE	Personal Protective Equipment
QSE	Quality, Safety, & Environmental
RIO	Remote Input/Output
SE	System Engineer
USGS	United States Coast Guard
VHF	Very High Frequency

DEFINITIONS

Bascule Bridge: A bascule bridge (commonly referred to as a drawbridge) is a moveable bridge with a counterweight that continuously balances a span, or "leaf," throughout its

upward swing to provide clearance for boat traffic. It may be single or double leafed. The name comes from the French term for balance scale, which employs the same principle. Bascule bridges are the most common type of movable span because they open quickly and require relatively little energy to operate.

Switch, Bypass: A manually operated device used to provide a means of directly connecting load conductors to a power source and manually bypass an automated function.

Command Response Communication Method: The 2-way radio communication method that is required used during bridge maintenance operations at the Haulover Canal Bridge. When the Bridge Maintenance Supervisor, or designated person, gives a command to the Bridge Tender, or designated operator, that pertains to a movement of a bridge span or other component, the Bridge Tender, or designated operator, shall confirm receipt and understanding of the command by repeating back the command, prior to initiating the operation.

Disconnecting Means. A device, or group of devices, or other means by which the conductors of a circuit can be disconnected from their source of supply.

Duty Office: ISC scheduling / base support coordination, and operations monitoring function.

Far Side: Bascule bridge components (i.e. span, machinery room, roadside equipment room, traffic gates, abutment, etc.) of a 2-leaf moveable bridge that are located on the side of the bridge opposite from where the Bridge Control Tower is located. For the Haulover Canal Bridge, the far side of the bridge is the south side.

Hertz (Hz): Hertz is a unit of frequency. The number of hertz equals the number of cycles per second. The frequency of any phenomenon with regular periodic variations can be expressed in hertz, but the term is used most frequently in connection with alternating electric currents, electromagnetic waves (light, radar, etc.), and sound. For the application of this Instruction document, hertz pertains to alternating electric current.

Knot: The knot, abbreviated kt or kn, is a unit of speed equal to one nautical mile (1.852 km) per hour or approximately 1.1508 miles per hour. The knot is used in meteorology, maritime and air navigation.

Near Side: Bascule bridge components (i.e. span, machinery room, roadside equipment room, traffic gates, abutment, etc.) of a 2-leaf moveable bridge that are located on the side of the bridge where the Bridge Control Tower is located. For the Haulover Canal Bridge, the near side of the bridge is the north side.

Shall: Use of the word “shall” denotes a mandatory requirement.

Shunt Trip: Shunt trip circuit breakers shut off electrical power during emergencies to prevent injury to people and damage to equipment. The shunt trip, a safety feature added to a regular circuit breaker, allows a location or outside of the main breaker to trigger a power shut-off.

REVISION RECORD

The following revisions have been applied to this document:

Revision Number	Change Description	Date
0	Initial Release. (NOTE: OMI Q3903, Revision B-1, which has been cancelled, was referenced in the development of this ISC Instruction.)	12/03/2015
1	Administrative change only. Document updated to remove branding of previous contract.	04/01/2019
2	Update to reflect changes in pendent bridge operations. Due to upgrade of motor drives.	05/05/2021

DOCUMENT APPROVALS

Signature on file

5/19/2021

X Ralph Gordon

Ralph Gordon
System Engineer
Signed by: cards

5/19/2021

X Earl Jarrett

Earl Jarrett
Bridges Supervisor
Signed by: EARL JARRETT (affiliate)

5/19/2021

X Ellen S. Feeney

Ellen Feeney
Manager System Engineering, HVAC, Divil, S...
Signed by: Ellen Feeney (affiliate)

5/20/2021

X Richard Rolon

Richard Rolon
Technical Operations Manager, FSEU, O&M ...
Signed by: RICHARD ROLON (affiliate)