

# Bridge Remote/Automated Operation Request Guide

U.S. Department of  
Homeland Security

United States  
Coast Guard



## Coast Guard Bridge Remote/Automated Operation Request Guide



## **SECTION 1 INTRODUCTION TO REMOTE/AUTOMATED OPERATIONS**

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In accordance with 33 Code of Federal Regulations (CFR) 117.42, upon written request by the owner of a drawbridge, the District Commander may authorize a drawbridge to operate under an automated system or from a remote location. If the District Commander authorizes a drawbridge to be remotely operated/automated at the request of a drawbridge owner, the drawbridge owner remains fully responsible to operate the drawbridge in accordance with the general and special drawbridge operating regulations prescribed in 33 CFR § 117.

Automated and remotely operated drawbridges shall be equipped and monitored to perform all functions as though a drawtender is on site and the bridge must satisfy all the requirements of 33 CFR § 117 Subparts A and B.

If the automated or remote operations system becomes inoperable or unreliable, the Coast Guard District Commander may require the bridge owner to provide an on-site drawtender to the bridge within a prescribed time for duration of the system outage or until corrective action is taken to allow the bridge to return to automated or remote operations. The District Commander may suspend a previous authorization to operate a drawbridge with inoperable or unreliable remote or automated equipment. The drawbridge will be required to be manned until the deficiencies are corrected to the satisfaction of the District Commander.

Vessel delays or failure to safely operate the bridge remotely, will result in a Civil Penalty investigation against the bridge owner for violation of bridge statutes to determine the cause and identify corrective actions needed to be taken by the bridge owner. Inadequate corrective actions or repeat violations by the bridge owner could result in termination of USCG approval to remotely operate the bridge.

When the District Commander determines that a request for automated or remote operation will meet the safe and reasonable needs of navigation, then the Coast Guard will initiate a rulemaking process to implement the change. Prior to determining whether to implement a final rule, the District Commander may require a trial period (temporary deviation or temporary rule) to regulate if the requested change in operation meets the safe and reasonable needs of navigation. If the final request is approved, a description that the bridge is being operated remotely and the details of the signaling requirements will be added to Subpart B of this part.

In situations when the District Commander denies the request for remote or automated operation, the USCG will notify the bridge owner of the decision for denial and any discrepancies that need to be corrected. If the discrepancies cannot be reconciled, the District Commander will deny the request and provide the process to file an appeal under 33 CFR 114.50.

The bridge owner may terminate remote operation of the bridge and operate the bridge on site at any time, upon immediate or advance notification to the District Bridge Administrator.

## **SECTION 2 SUGGESTED REQUEST PACKAGE**

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### **A. Project Initiation**

1. The applicant should contact the applicable Coast Guard District Bridge Office to discuss the proposed bridge project and follow the suggested requirements in this Guide as well as the below suggested guidelines or frameworks.
  - a. AASHTO Guidelines- <https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-07Task424.pdf>
  - b. The NIST Risk Management Framework for Information Systems and Organizations is available free of charge from: <https://doi.org/10.6028/NIST.SP.800-37r2>
  - c. DHS/NIST Special Publication 800-37, Rev. 2, Risk Management Framework for Remotely Operated Bridges Summary, available on request from the District Commander.
2. The Coast Guard District Bridge Office will review the bridge's operational history, records of both maritime and land transportation usage, and the waterway information.
3. The Coast Guard District Bridge Office will determine if the bridge is suitable for consideration for remote or automated operations.

### **B. Location, Description and Current Operation:**

1. The request package should contain a detailed description of the bridge and the waterway that is upstream and downstream of the bridge area. Consideration should be given to the location of the bridge on the waterway and potential hazards due to its location (i.e., blind bend, low visibility).
2. The bridge owner must provide a navigation evaluation (type and size of vessels, cargo, frequency of transits, history of allisions/mishaps with the bridge) and anticipated number of trains or vehicles that transit the bridge per day. The navigation evaluation should address the waterway impacts of the proposed change in a drawbridge operation schedule with the ability of a vessel to transit through the bridge in a reasonably free, safe, and unobstructed manner.
3. The bridge must be well maintained, free of material defects, and have all movable parts in sound operating condition.
4. The package must include a complete description of the proposed change and reasons for the change.

**C. Monitoring Equipment:**

1. Detailed information must be provided on how the bridge operator will be monitoring the waterway.
  - a. The bridge operator must have a clear unobstructed view at all times up and down the waterway from the bridge and under the bridge.
  - b. The bridge operator must be able to hear sound signals and see visual signals from the requesting vessels and respond in kind.
  - c. The bridge owner will identify locations of monitoring devices both on the bridge and on the waterway (if any) and list their capabilities.
2. Provide a list of all the devices for safe passage to mariners such as signage at the bridge indicating operating and communication instructions, warning signals when the bridge is in operation, anti-collision sensors, and vessel detectors.
3. Describe the backup system in the event of a failure of the primary monitoring devices or bridge components. The bridge owner must also identify monitoring devices used for inclement weather.

**D. Contact/Communication:**

1. The request must describe in detail how communications will be conducted between the waterway user and the bridge operator and where/how the mariner can find that information.
2. Multiple modes of communication should be considered (radio, phone, visual and sound signals, AIS, camera feeds, etc.).
3. The Bridge Owner shall provide a complete copy (up to 5 years, depending on the District Commanders request) of the bridge logs required per 33 U.S.C. 499(f).

**E. Operations:**

1. Describe the terms and conditions of how the bridge will be operated remotely/automated.
  - a. The request must describe in detail how a mariner will determine the on-station status of the bridge, such as if the bridge is fully open, in the fully closed position, or in motion.
  - b. As required by 33 U.S.C. 499(f), logbooks must include information on the data logging system that records bridge activity, including opening dates and times; status information and activation/notification of any emergency.
  - c. The bridge owner will describe the process used for tracking the remote bridge operator schedule, including the transfer of operators for any reason. Also, the request

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should include a list of collateral duties (if any) the drawtender will be responsible for during their shift. The collateral duties must not interfere with the bridge operator's ability to open the bridge as required by the operating regulations.

- d. Describe any backup systems that provide continuity of operations, up to and including manual operation of the bridge. Indicate the location of the remote operation center and its proximity to the bridge.

### **F. Emergency/Security/Cybersecurity:**

1. Describe how the bridge will be operated in case the remote operation fails or if there is an incident at the bridge. Include the following:
  - a. The location of the emergency controls, a description of the emergency control capabilities, and anticipated response time.
  - b. A description of the measures/systems used to detect intruders or vandalism and how the mariners will be notified of any change in the status of the bridge's operation.
  - c. A list of the Cybersecurity measures being planned. The plan should meet either the National Institute of Standards and Technology or the American Association of State Highway and Transportation Officials Guidelines for the Operation of Movable Bridges from a Remote Location.

### **G. Rule Making:**

If the District Commander determines that the requested change in operation is feasible for all vessels to transit through the bridge in a reasonably free, safe, and unobstructed manner then the USCG will begin a rulemaking to implement the change. The District Commander may require a trial period (temporary deviation or temporary rule) to determine if the requested change in operation meets the needs of navigation prior to determining whether to implement a final rule.

As noted previously, Vessel delays or failure to safely operate the bridge remotely, will result in a Civil Penalty investigation against the bridge owner for violation of bridge statutes to determine the cause and identify corrective actions needed to be taken by the bridge owner. Inadequate corrective actions or repeat violations by the bridge owner could result in termination of USCG approval to remotely operate the bridge.

The bridge owner may terminate remote operation of the bridge and operate the bridge on site at any time, upon immediate or advance notification to the District Bridge Administrator.

**SECTION 3 REQUESTED GENERAL INFORMATION**

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**A. Submit the requested information in the format outlined below to the Coast Guard District, Bridge Program Office, that has jurisdiction over the bridge(s) in question. This Request Template is also provided on the Bridge Program public website: <https://www.dco.uscg.mil/Our-Organization/Assistant-Commandant-for-Prevention-Policy-CG-5P/Marine-Transportation-Systems-CG-5PW/Office-of-Bridge-Programs/> *to be entered when posted***

1. The Bridge Owners will provide a Remote Operations Plan, Contingency Plan and Cybersecurity Plan (each containing the information described below), that will be attached as enclosures to this request. Failure to provide any of the requested documentation could result in the denial to this remote operations request.

Salutation (i.e., Dear Sir/Ma'am):

Request is hereby made to remotely operate or automate a bridge.

Request Date: | |

a. Bridge Owner information:

- 1) Name (company/agency and POC name):

| |

- 2) Address:

| |

- 3) Telephone number; and

| |

- 4) Email address:

| |

b. Consultant/Agent information (if employed):    Check here if not applicable:

- 1) Name (company/agency and POC name):

| |

- 2) Address:

| |

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3) Telephone number:

| |

4) Email address; and

| |

5) Document authorizing the consultant/agent to act on behalf of the applicant:

Enclosure number and document name:

| |

c. Name and a detailed description of the Bridge(s) to be remotely operated/automated:

| |

d. Name and a detailed description of the waterway, both upstream and downstream, that the bridge(s) is in or over. Consideration should be given to the location of the bridge on the waterway and potential hazards due to its location (blind bend, low visibility, etc.):

| |

e. Number of miles above the mouth of the waterway where the bridge(s) is (are) located (mile mark) and provide latitude and longitude coordinates (degree/minute/second) at centerline of navigation channel (Lat/Long must be measured to WGS-84 datum. Contact the local Coast Guard Bridge Office for guidance if needed):

Mile mark | | Lat/Long | |

f. The bridge owner must provide a navigation evaluation with the following items:

1) type and size of vessels.

| |

2) cargo being carried.

| |

3) frequency of transits.

| |

4) history of allisions/mishaps with the bridge.

| |



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5) anticipated number of trains that transit the bridge per day.

| |

- g. The navigation evaluation should address the impacts of the proposed change in a drawbridge operation on the ability of a vessel to transit through the bridge in a reasonably free, safe, and unobstructed manner.
- h. City or town, county/parish, and state where the bridge(s) is located at, near, or between:

| |

2. Brief description of the requested change:

| |

a. The reason for the requested change (per 33 CFR § 117.8):

| |

b. Type of bridge (drawbridge, bascule, vertical lift, swing span, pontoon, etc.), highway, railway, pedestrian:

| |

c. Is the bridge currently maintained in the open or closed to navigation position?

| |

d. Vertical clearance in the both the open and closed to navigation positions:

| |

e. drawbridge cycle time:

| |

f. Does the bridge currently have a special operating condition in 33 CFR § 117, Subpart B?

Yes    No

If yes, please describe:

| |

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- g. The systems being utilized on an automated or remote bridge must immediately alert the bridge owner if an operational failure occurs. The bridge owner will have a Contingency Plan showing the response time needed to correct the failure and contact the local Coast Guard to facilitate notification of maritime traffic.
3. The Bridge Owner shall provide a complete copy (up to 5 years, depending on the District Commanders request) of the bridge logs required per 33 U.S.C. 499(f).

## **SECTION 4 REMOTE OPERATIONS PLAN**

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### **A. The Remote Operations Plan is a data collection tool used by the Coast Guard.**

1. The Bridge Owner will provide a Remote Operations Plan (as an enclosure) that will detail the following:
  - a. The visibility must be clear and unobstructed up and down the waterway, and equal or exceed the current visibility available to the on-site draw tender. The Remote Operations Plan will describe how this is being accomplished (page and paragraph). See AASHTO Guidelines 3.3.2 and 3.3.3 (link provided).  
  
| |
  - b. The Remote Operations Plan will indicate that the local control system at a remotely operated bridge will be capable of operating the movable bridge locally with all safety interlocks in place without reliance on the remote operating station and/or the associated communication link. See AASHTO 3.3.2.  
  
| |
  - c. The types of Vessel detection systems that will be installed. (Radar? Other?) Bridge owner must also identify monitoring devices used for inclement weather. (Page and paragraph). See AASHTO Guideline 3.3.3.  
  
| |
  - d. The remote operations site will be able to respond to communications from the waterway users (radio, telephone, audible or visual signal, etc.) as well or better than the communications currently at the on-site location, being able to hear and see sound and visual signals from vessels and respond in kind. The Remote Operations Plan will describe how this is being accomplished (page and paragraph). See AASHTO Guideline 3.3.2 and 3.3.4.  
  
| |
  - e. That all signs be posted at the bridge must notify mariners of the updated contact methods per 33 CFR § 117.55 (page and paragraph).  
  
| |
  - f. The amount of redundancy the remote operating system will have. A description of the backup system in case any of the primary monitoring devices or bridge components fail. The Remote Operations Plan will describe how this is being accomplished (page and paragraph). See AASHTO Guideline 3.3.3.  
  
| |

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- g. As part of the Remote Operations plan the Bridge Owner will detail a training program for the remote bridge tenders with periodic refresher training or updates (page and paragraph). See AASHTO Guideline Recommendation #2, p.15.

| |

- h. The Remote Operations Plan assesses the current and future navigation traffic at the/each bridge to be remotely operated and has determined the appropriate number of remote operating stations, tenders and tender shifts required to meet operating demands. See AASHTO Guideline 3.3.1.1.

| |

- i. The Remote Operations Plan will indicate how many bridge tenders will be on duty at the control center, the number and length of the shifts and if the bridge tenders are responsible for a single or multiple bridges. If multiple, how many (page and paragraph). See AASHTO Guideline 3.3.1.1.

| |

- j. The Remote Operations Plan will indicate if the Bridge Owner plans to assign the bridge tenders collateral duties and how will these collateral duties detract from the bridge tender duties (page and paragraph). See AASHTO Guideline 3.3.1.1.

| |

- k. The Remote Operations Plan will indicate if the Bridge Owner plans to make the bridge tender duties collateral to another function and, if so, how will this function interfere with the bridge tender duties (page and paragraph). See AASHTO Guideline 3.3.1.1.

| |

2. The Remote Operations Plan will show that a technical assessment of the age, condition, availability, and compatibility of the existing system components has been made, such that proper integration of the proposed remote operating system is assured (page and paragraph). See AASHTO 3.3.1.4

| |

3. Implementation of remote operations introduces specialty equipment and devices that are not prevalent on locally operated bridges. The Remote Operations Plan should address the impacts and mitigation techniques necessary for the remote operating systems and develop required maintenance plans and practices to effectively operate and maintain the additional components required to remotely operate movable bridges (page and paragraph). See AASHTO 3.3.1.5.

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4. In addition, protocols shall be developed and implemented to protect maintenance personnel present on remotely operated bridges (page and paragraph). See AASHTO 3.3.1.5.

| |

5. The Remote Operation Plan should indicate the implementation of remote operations occur with a preliminary pilot operation period such that the bridge to be remotely operated is served by a local tender in addition to the remote tender (page and paragraph). See AASHTO 3.3.1.6.

| |

6. The Bridge Owner acknowledges that the bridge will continue to open on its current schedule. Any change to the bridge's operating schedule will be handled through the normal rulemaking process (page and paragraph).

| |

7. The Bridge Owner will coordinate with the Coast Guard on an installation schedule of pertinent equipment for remote operations, providing continuous notification to waterway users through Local and Broadcast Notices to Mariners (page and paragraph).

| |

8. In accordance with 33 CFR § 117.42, a description of the operation of the remotely operated or automated bridge will be included in 33 CFR § 117 Subpart B, even if the bridge is open on demand (page and paragraph).

| |

9. As noted above, the Remote Operations Plan will be attached to this request as a separate enclosure.

AASHTO Guidelines- <https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-07Task424.pdf>

## SECTION 5 CONTINGENCY PLAN

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### **A. The Contingency Plan is a data collection tool used by the Coast Guard.**

1. The Bridge Owner will provide a Contingency Plan (as an enclosure) showing the following:
  - a. The responsible parties and the response time during an operational failure, either at the bridge or the remote operating center. The response time will not exceed the current response time (page and paragraph).  
| |
  - b. What the Bridge Owner deems an “acceptable delay” to waterway traffic in the event of an operational failure, either of the bridge itself or the remote operating system (page and paragraph).  
| |
  - c. The responsible parties and response time required to return draw tenders to the bridge in the case of remote operations site failure (page and paragraph). See AASHTO Guideline 3.3.1.2.  
| |
  - d. The responsible parties and response time required to respond to a mechanical failure at the bridge (this will not exceed the current response time) (page and paragraph). See AASHTO Guideline 3.3.1.3.  
| |
  - e. The Contingency Plan will contain the contact information of the Coast Guard Sector where the bridge is located, to be used in case of remote operations site or bridge mechanical failure.  
| |
2. The machinery necessary to operate the bridge onsite will remain and be kept in good operating condition.  
| |
3. As noted above, the Contingency Plan will be attached as a separate enclosure to this request.

AASHTO Guidelines- <https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-07Task424.pdf>

## **SECTION 6 CYBER SECURITY PLAN**

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### **A. The Cybersecurity Plan is a data collections tool used by the Coast Guard.**

The Bridge Owner will provide a Cybersecurity Plan (as an enclosure) showing the following:

1. A NIST Risk Management Framework (also see the AASHTO study) that clearly defines how the bridge owner should plan to address the five cybersecurity areas listed below-

#### **a. Identify-**

- 1) Include a list of all equipment, software, and data that will be used, including laptops, smartphones, tablets, and point-of-sale devices (page and paragraph).
- 2) Create and share a company cybersecurity policy that covers:
  - a) Roles and responsibilities for employees, vendors, and anyone else with access to sensitive data (page and paragraph).
  - b) Steps the Bridge Owner will take to protect against an attack and limit the damage if an attack occurs (page and paragraph).

#### **b. Protect-**

How the bridge owner:

- 1) Controls who log on to their network and uses their computers and other devices (page and paragraph).
- 2) Utilizes security software to protect data (page and paragraph).
- 3) Encrypts sensitive data, at rest and in transit (page and paragraph).
- 4) Conducts regular backups of data (page and paragraph).

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- 5) Updates security software regularly, automating those updates if possible (page and paragraph).
- 6) Has formal policies for safely disposing of electronic files and old devices (page and paragraph).
- 7) Trains everyone who uses their computers, devices, and network about cybersecurity. Ensure employees understand their personal risk in addition to their crucial role in the workplace (page and paragraph).

### c. **Detect-**

How the bridge owner:

- 1) Monitors the computers for unauthorized personnel access, devices (like USB drives), and software (page and paragraph).
- 2) Investigates any unusual activities on their network or by their staff (page and paragraph).
- 3) Checks the network for unauthorized users or connections (page and paragraph).

### d. **Respond**

Plan for:

- 1) Notifying customers, employees, and others whose data may be at risk (page and paragraph).
- 2) Keeping bridge operations up and running (page and paragraph).
- 3) Reporting any attack to law enforcement and other authorities (Coast Guard)



(page and paragraph).

- 4) Investigating and containing an attack (page and paragraph).
- 5) Updating the cybersecurity policy and plan with lessons learned (page and paragraph).
- 6) Preparing for inadvertent events (like weather emergencies) that may put data at risk (page and paragraph).

e. **Recover**

After a post attack:

- 1) Repair and restore the equipment and parts of their network that were affected (page and paragraph).
- 2) Keep employees and customers informed of their response and recovery activities (page and paragraph).

**B. As noted above, the Cyber Security plan will be attached as a separate enclosure to this request.**

The NIST Risk Management Framework for Information Systems and Organizations is available free of charge from: <https://doi.org/10.6028/NIST.SP.800-37r2>

AASHTO Guidelines- <https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-07Task424.pdf>