



National Dredging Quality Management Program (DQM)

ANNUAL QUALITY ASSURANCE (QA) CHECKS - PIPELINES

This document is a guide for conducting annual National Dredge Quality Management Program (DQM) quality assurance (QA) checks on pipeline dredges. It provides general guidance for the processes to be followed; however, as in all marine operations, it is important that personnel be aware of the vessel's specifics and use critical thinking to ensure that the process applied is the best way to safely and reliably collect the required data.

It is DQM's goal to provide safe, expeditious service when performing a QA check; therefore, there is no set order or procedure for the check as a whole. The QA check team is responsible for working with the dredger and system provider to ensure that all required checks are performed and that the necessary data is collected while also attempting to minimize interruptions to normal operations.

All checks must be performed.

Position Check

The annual QA check for pipeline dredges includes checking the latitude and longitude reported on the DQM onboard display against the readings from a handheld GPS receiver. The two readings should differ by no more than 3 m (10'), depending on the number of satellites available and the location of the antenna.

Purpose

To verify the accuracy of the dredge positioning system.

Materials Required

- Handheld GPS unit
- DQM QA Check spreadsheet—GPS Position Check Form

Procedure

1. Turn on the handheld GPS, and allow sufficient time for it to acquire the maximum number of satellites at a static location.

2. Record the GPS location as close to the DQM GPS antenna location as possible.

Note: See the Dredge Plant Instrumentation Plan [DPIP] for the antenna location.)

3. At the same time, record the position reading indicated on the DQM display.

Note: This may require a second person or a camera/screenshot.

4. Enter both readings and the calculated difference in location into the Dredge Position Check Form.

Note: In almost all cases this data should be entered in the columns labeled GPS1.

5. Record the number of satellites received in the remarks on the form.

Note: The difference in position should be less than 10'.

Suction Mouth Depth Check

The annual QA check for pipeline dredges requires calibration checks of the reported suction mouth depth using a manual means, such as a tape measure or sounding line, to directly measure the depth.

Where pressure sensors are used to calibrate the depth sensors, there must be a record of calibration for the past 12 months, and all sources of potential interference should be avoided.

The QA check team reviews the depth data to ensure that the system is operating within acceptable accuracy, directing the contractor to recalibrate or repair system components as necessary. Weekly calibration of the depth sensor is recommended as these sensors are sensitive to environmental conditions.

Purpose

To verify the accuracy of the ladder depth sensors.

Materials Required

- Pipeline QA spreadsheet (Suction Mouth Depth Check form)/notebook
- Steel tape, chain, or wire with clearly visible flags/tags placed at 1' increments within the operational range of the ladder; it should be capable of measuring the depth below the water with sufficient length to measure 5' over the maximum project depth.

Note: The contractor is responsible for supplying this item.

- Handheld radio to communicate with the bridge

Note: If a pressure sensor is being used, the radio may cause interference.

Procedure

Note: This test is highly dependent on wave heights and should be conducted in very low wave situations due to possible errors caused by reading the measuring tape incorrectly.

1. Attach the steel tape or chain to the cutterhead or ladder, and note any offset to the suction mouth.
2. Lower the ladder, so that one of the flags is even with the water's surface.
3. Note the depth indicated by the tape or chain.
4. Call up to the lever room, and record the value displayed on the DQM screen.
5. Repeat the procedure for a minimum of three depths within the operating range of the ladder.

Note: The difference between the manually measured and system-measured averages should be $\leq 0.5'$.

Velocity Check

The annual QA check for pipeline dredges requires calibration checks of the reported velocity using a dye test or calibrated external meter.

Additionally, the accurate pipeline length from the point of dye injection to the outfall is required. If an external meter is used for calibration checks, the meter must be calibrated within the past year, and its installation must meet the manufacturer's instructions.

The QA check team review the velocity data to ensure that the system is operating within acceptable accuracy and directs the contractor to recalibrate or repair system components as necessary.

Purpose

To verify the accuracy of the velocity instrumentation.

Materials Required

- Pipeline QA spreadsheet (Velocity Check form)/notebook
- Environmentally appropriate testing dye and an injection point/procedure (Bright Dyes by Kingscote Chemical, available at McMaster-Carr, is EPA approved)
- **Note:** The contractor is responsible for supplying these items.
- Handheld radio to communicate
- Stopwatch

Procedure

Note: It is recommended that this test be run more than once and at more than one velocity to verify instrument accuracy.

1. Run the dredge pump in such a way as to provide a steady flow of water with no material.
2. Verify that the velocity and rpm remain constant.
3. Inject the dye in the pipeline, and start the stopwatch.
4. Monitor the velocity reading to verify that it remains constant.
5. Stop the stopwatch at the first sighting of dye from the outfall.
6. Using the pipe length and time, determine the velocity and compare it to the onboard reading.