



Conestogo Dam Operator Competency Assessment Guide



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1 – Introduction and expectations

PURPOSE:

A tool to determine a new Conestogo Dam Operator is competency and ability to successfully perform the required duties necessary.

DEFINITIONS:

Instructor: A competent person that possesses the knowledge contained within this document. It is preferred that the Instructor is a current operator with at least 3 years experience.

Trainee: A person who is a new dam operator in training

Full dam operator status: Dam operator who is able to successfully complete all duties necessary.

GENERAL:

This guide is intended to assist in the evaluation of a new dam operator at Conestogo Dam. The content will help assess the basic, minimum knowledge required to be a successful dam operator. Before his/her assessment date, the trainee will receive training and instruction regarding all the objectives mentioned in this guide.

This evaluation will be conducted onsite with the Instructor, trainee, and an optional senior engineer present. The Instructor will usher the trainee through each section of this guide and assess his/her ability to complete the objectives.

To be deemed competent, the trainee must obtain “met expectation” for each objective listed in the guide below. The Instructor’s discretion will deem if the trainee meets the expectations for each objective. If the trainee does not meet expectations, he/she shall receive additional training on the objective and a reassessment will be conducted before he/she can obtain full dam operator status. Reassessment will be completed on a later date to be discussed with the people involved. Once trainee meets all expectations, he/she can obtain a full dam operator status and start being on-call.

INSTRUCTIONS:

The assessment guide is divided in five categories, Review of Conestogo Dam Manual, Morning Report, Sluice gate operations, Turbine Operations, and Maintenance/Miscellaneous. At the end of each

category the instructor will assess the trainee's confidence level completing the process, using a rating scale. After completing a section, both the instructor and trainee shall initial to confirm completion.

Review of Conestogo Dam Manual

The instructor and trainee will review of the operations manual to ensure the trainee understands its content and how to utilize it. It is also requiring that the trainee reads "Conestogo Dams General Overview," in section one of the manual.

Morning Report

Trainee will complete a morning report under the observation of the instructor. Trainee will also be given a scenario to calculate an average discharge.

Sluice Gate Operations

A minor target discharge will be provided by the instructor for the trainee to complete. It is recommended that the target discharge provided is a minor one, to not disrupt normal operations at the dam. Preferably between 5 – 10 cms. Under the observation of the instructor, the trainee will complete a gate operation and be assessed on his/her implementation. This operation will be repeated using the steel band method. When two successful openings have been achieved, the trainee will be instructed to reduce gate discharge to "**four cubic metres per second.**" This gate opening will remain until turbine operations assessment is completed. In addition, the trainee will be given a large discharge scenario where the trainee requires to show the which gates will be used, and their openings. The trainee must show an understanding of spreading the discharge equally between sluice gates.

Turbine Operations

The instructor will assess the trainee's knowledge of the turbine and its operations. The instructor will go over and request the trainee to complete and/or explain each objective therein.

Maintenance/miscellaneous

The instructor will go over and request the trainee to complete and/or explain each objective therein.



2 – Review of Conestogo Dam Operators Manual

EXPECTATIONS MET	OBJECTIVE
<input type="checkbox"/> YES <input type="checkbox"/> NO	Understands how to utilize the operator manual
<input type="checkbox"/> YES <input type="checkbox"/> NO	Reads and understands General Overview

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Trainee Initials

Instructor Initials



3 – Morning Report

MET EXPECTATIONS	OBJECTIVE
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to acquire weather info (<i>Trainee must demonstrate to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Witnessed trainee complete visual inspection of dam structure and building upon arrival
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to complete manual lake level dip and calculates correct lake level (<i>Trainee must demonstrate to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to log onto the computer and opens the necessary applications (<i>Trainee must demonstrate to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to determine correct current discharge (<i>Trainee must demonstrate to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to calculate correct inflow (<i>Trainee must demonstrate to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to complete and send/print morning report (<i>Trainee must demonstrate to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to correctly complete written daily logbook (<i>Trainee must demonstrate to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to correctly complete daily reports spreadsheet (<i>Trainee must demonstrate to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to complete the daily walkthrough inspection of all levels (<i>Trainee must demonstrate to Instructor</i>)
ADDITIONAL OBJECTIVES	
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to calculate correct average discharge. – Scenario Appendix A – (<i>Trainee must demonstrate to Instructor</i>)

	EXCELLENT 4	VERY GOOD 3	SATISFACTORY 2	NEEDS IMPROVEMENT 1	SCORE
OVERALL SKILL COMPLETING MORNING REPORT	Exhibits high degree of confidence. Self-assured. Will successfully perform duties	Exhibits Significant Confidence. Minimal mistakes made. Will successfully perform duties	Exhibits Satisfactory Confidence. Some mistakes made. Will successfully perform duties	Hesitant. Makes mistakes. May not be able to perform duties	

Trainee Initials

Instructor
Initials



4 – Sluice Gates

- Opening a sluice gate upon receiving an operations order:

MET EXPECTATIONS	OBJECTIVE
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to look up correct gate opening, using the computer, upon receiving a target discharge. <i>(Trainee must demonstrate to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Witnessed trainee inspect the downstream for people or objects.
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee energizes sluice gate hoist <i>(Trainee must demonstrate to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Witnessed trainee sound the gate opening warning horn
<input type="checkbox"/> YES <input type="checkbox"/> NO	Witnessed Trainee observes amp reading while lifting gate
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee opens gate to the correct opening using electronic display <i>(Trainee must demonstrate to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Witnessed trainee checks brake before completing hoist lock out
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee completes hoist lock out <i>(Trainee must demonstrate to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee completes gate setting report <i>(Trainee must demonstrate to Instructor)</i>
ADDITIONAL OBJECTIVES	
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to achieve correct gate opening using the steel band system <i>(Trainee must demonstrate to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to adjust the brake when necessary <i>(Trainee must demonstrate to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to look up approximate gate opening using discharge curves chart <i>(Trainee must demonstrate to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Given the scenario in Appendix B, trainee must select most correct number of gates and their openings for a large discharge. Gate openings should be spread evenly <i>(Trainee must demonstrate to Instructor on paper)</i>

- Closing a gate

MET EXPECTATIONS	OBJECTIVE
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to close a sluice gate <i>(Trainee must demonstrate to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to decrease gate opening to a target discharge
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands when a sluicgate has properly closed <i>(trainee must explain the basics to Instructor)</i>

	EXCELLENT 4	VERY GOOD 3	SATISFACTORY 2	NEEDS IMPROVEMENT 1	SCORE
OVERALL SKILL COMPLETING GATE OPERATIONS	Exhibits high degree of confidence. Self-assured. Will successfully perform duties	Exhibits Significant Confidence. Minimal mistakes made. Will successfully perform duties	Exhibits Satisfactory Confidence. Some mistakes made. Will successfully perform duties	Hesitant. Makes mistakes. May not be able to perform duties	

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Trainee Initials

Instructor Initials



5 – Turbine

MET EXPECTATIONS	OBJECTIVE
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands general arrangement of turbine (<i>Trainee must be able to identify each item to Instructor</i>) <ul style="list-style-type: none"> ○ Water bearing shut-off ○ Filter baskets ○ Butterfly valve ○ Counterweight ○ Blade angle actuator ○ Oil level indicator ○ Oil cooler ○ Breather filter ○ Flow sensor ○ Wickets ○ Water bearing ○ Generator ○ Thrust bearing ○ Turbine dewatering valve ○ Downstream service gate ○ Sump pumps
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands the process in the event of an unscheduled shutdowns (<i>trainee must explain when and how to replace to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to log on and navigate the Conestogo Dam Generator Station control panel (<i>Trainee must be able to demonstrate each item to Instructor</i>) <ul style="list-style-type: none"> ○ Able to adjust turbine output ○ Able to view and clear alarms ○ Able to view Temperatures values & trends ○ Able to view Bearing vibration values & trends
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to shutdown turbine (<i>Trainee must demonstrate to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to restart turbine (<i>Trainee must demonstrate to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands all the required settings for automatic gate four to open in the case of an unscheduled shutdown (<i>Trainee must be able to state each item to Instructor</i>) <ul style="list-style-type: none"> ○ Gate four disconnect switch on MCC must be switched to “ON” ○ Gate four selector key on MCC must be set to “Auto” and the red emergency stop button below the “Auto/Hand” Key is pulled out

- The red emergency stop button inside gate four’s control panel is unlocked and pulled out
- Ensure gate four gate opening indicator is reading an opening of 0.00 or less
- Alarms cleared on the Conestogo Dam Generator Station control panel on the computer. Every time gate four selector switch has been switched between Auto and hand

<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to complete a blade angle change <i>(Trainee must demonstrate to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to switch turbine to “Idle Mode” <i>(Trainee must demonstrate to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands the ventilation system including location of each fan
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands the basics of dewatering the main intake pipe and draft pipe <i>(trainee must explain the basics to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to clean filter baskets <i>(Trainee must demonstrate to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to clean flow sensor <i>(Trainee must demonstrate to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands proper oil level <i>(Trainee must state proper oil level of 8.5)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to add oil to turbine if needed <i>(Trainee must demonstrate to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands the sump pump system <i>(trainee must explain the basics to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands the breather filter <i>(trainee must explain when and how to replace to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to flush water bearing water supply line <i>(Trainee must demonstrate to Instructor)</i>
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to open and close downstream service gate <i>(Trainee must demonstrate to Instructor)</i>

	EXCELLENT 4	VERY GOOD 3	SATISFACTORY 2	NEEDS IMPROVEMENT 1	SCORE
OVERALL SKILL TURBINE OPERATIONS	Exhibits high degree of confidence. Self-assured. Will successfully perform duties	Exhibits Significant Confidence. Minimal mistakes made. Will successfully perform duties	Exhibits Satisfactory Confidence. Some mistakes made. Will successfully perform duties	Hesitant. Makes mistakes. May not be able to perform duties	

Trainee Initials

Instructor Initials



6 – Maintenance/Miscellaneous

MET EXPECTATIONS	OBJECTIVE
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to test run both in-house and portable standby generators (<i>Trainee must demonstrate to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands the heating system (<i>trainee must explain the basics to Instructor</i>) <ul style="list-style-type: none"> ○ Shaft heaters ○ Oil furnace
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to read and record uplift pressures and piezometer readings (<i>trainee must explain the basics to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands the fourth-floor sump pump system (<i>trainee must explain the basics to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands the road deck drain heaters (<i>trainee must explain the basics to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands the bubbler system that is in place during the winter months (<i>trainee must explain the basics to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands all grease points and their frequency throughout the dam (<i>trainee must explain the basics to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands ventilation fan belt maintenance (<i>trainee must explain the basics to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands general housekeeping
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands general diesel fuel supply system to standby generator and furnace (<i>trainee must explain the basics to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee understands low level diesel alarm (<i>trainee must explain the basics to Instructor</i>)
<input type="checkbox"/> YES <input type="checkbox"/> NO	Trainee able to flush wet well (<i>Trainee must demonstrate to Instructor</i>)

	EXCELLENT 4	VERY GOOD 3	SATISFACTORY 2	NEEDS IMPROVEMENT 1	SCORE
OVERALL SKILL DAM OPERATIONS	Exhibits high degree of confidence. Self-assured. Will successfully perform duties	Exhibits Significant Confidence. Minimal mistakes made. Will successfully perform duties	Exhibits Satisfactory Confidence. Some mistakes made. Will successfully perform duties	Hesitant. Makes mistakes. May not be able to perform duties	

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_____ _____
 Trainee Initials Instructor Initials



7 – Final Evaluation & Sign off

I, _____ certify that _____ has demonstrated that he/she possesses the basic competencies to be able to successfully carry out the duties as the dam operator of Conestogo Dam.

I, _____ acknowledge that I have received the information, training, and instruction as indicated above. I am confident in my ability to successfully carry out the duties as the dam operator of Conestogo Dam.

Instructor Name

Trainee Name

Director of Engineering

Instructor
Signature

Trainee Signature

Director of Engineering
Signature

Date

Date

Date



Appendix A

Average Discharge Calculation Scenario

Calculate average discharge for today's 08:00 morning report.

- Yesterday morning report at 08:00:
 - * Discharge: 75 m³/s
 - * Storage: 50100
- Yesterday at 14:30:
 - * Discharge increased to 100 m³/s.
- Yesterday at 16:30:
 - * Discharge increase to 125 m³/s.
- Today's morning report:
 - * Discharge: 100 m³/s
 - * Storage: 51800

Average discharge = _____



Appendix B

Larger Sluice Gate Opening

A senior operator ordered a discharge increase to 60 m³/s. Show the number of gates you would open and to what setting you would open each gate?

Gate 1: _____

Gate 2: _____

Gate 3: _____

Gate 4: _____