

CONESTOGO DAM OPERATOR MANUAL - TABLE OF CONTENTS

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Morning Report/Daily Dam Inspection



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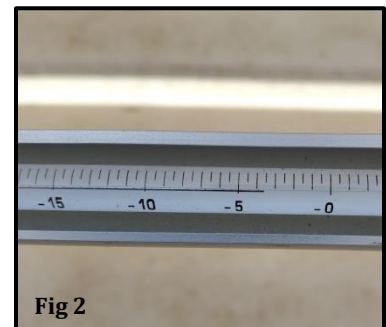
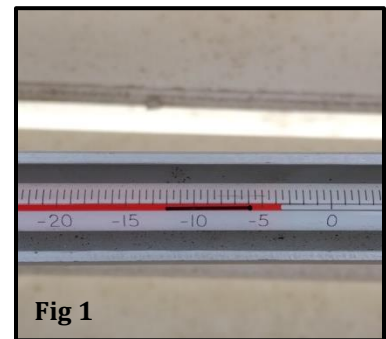
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1 - Acquiring Weather info for dam report

Prior to inspecting the dam, record the current weather info at the Conestogo Lake shop. The shop is located at the back of the park. The weather daily log, a small memo booklet, is located at the main front door of the shop. Ensure to take this with you to the dam once you have recorded the following:

- Record the daily temperatures from the weather station. There are two thermometers located inside. The top thermometer reads the **LOW** and **CURRENT** temperatures (See Fig 1).
- The lower thermometer reads the **HIGH** temperature of the day (See fig 2).
- The morning's weather observation, i.e., sunny, cloudy, overcast etc.



Once the **HIGH**, **LOW** and **CURRENT** temperatures recorded, check the rain gauge for any rainfall that might have occurred throughout the night. The rain gauge is located off the side of the weather station.

Below is an example on how to fill out the weather log.

DATE

TEMPERATURE IN ORDER FROM LEFT TO RIGHT; HIGH, LOW, CURRENT

MORNING WEATHER OBSERVATION

AFTERNOON WEATHER OBSERVATION (No longer recorded, morning observations only)

Date	High	Low	Current	Morning Observation	Afternoon Observation
19	26	17	20.5	Cloudy	28.5, 20.5, 27
20	27	14.5	18	overcast w/prec	25.5, 18, 24.5
21	26	18	20.5	Sunny	no prec



2 - Arrival at Dam

Upon driving onto the Dam, take note of:

- Slopes and the main structure of the dam. Look for anything out of the ordinary, such as breaches in the wing wall, defects in structures, vandalism, etc. In addition, always have a look downstream, noting flow/level of the river downstream. Is the river what it should be?

When entering the main building of the dam:

- Look around, listen, and note any unusual smell or signs that something is not operating correctly. You are looking and hearing for: Alarms, light's flashing, generator running or smells /sounds that would indicate equipment is not running properly. A common alarm, in the wintertime especially, is the low diesel fuel alarm. (See "Maintenance Operations," Sec. 6)

Take a walk through the gate hoist building, make sure:

- Gate opening indicators are reading properly and are set at the correct level. If uncertain of what the gates are to be set at, check the log upstairs. In the winter, you will need to monitor the air bubblers that are located at each gate making sure they are keeping the water around gates and stem free of ice. Check all doors to make sure they are secure.

Once the walkthrough of the hoist building is completed, exit out of the door located on the upstream side of the dam hoist building.

- Inspect the turbine service gate hoist building for signs of forced entry or problems. This is also where the manual lake level dip is obtained (*covered in Section 3, Taking a manual lake level reading*) Look under the structure where gates are located to view any signs of concerns (i.e., falling concrete, water over the stilling basin. In the winter this is a great observation point to inspect if bubblers are keeping water open between each pier).

Once the initial visual inspection is completed and a manual lake level reading is taken (*covered in section 3*) you are ready to go upstairs to complete your report.



3 - Taking a manual lake level reading

To take a manual lake level reading, access the turbine gate hoist building (*as explained in section 2*).

Inside, an ECG is used to acquire manual lake level dip.

1. Attach the red ground to the small screw on the junction box
2. Roll the tape down until the light turns red
3. Take the number that is on the tape and carry out the lake level calculation to acquire current lake elevation.

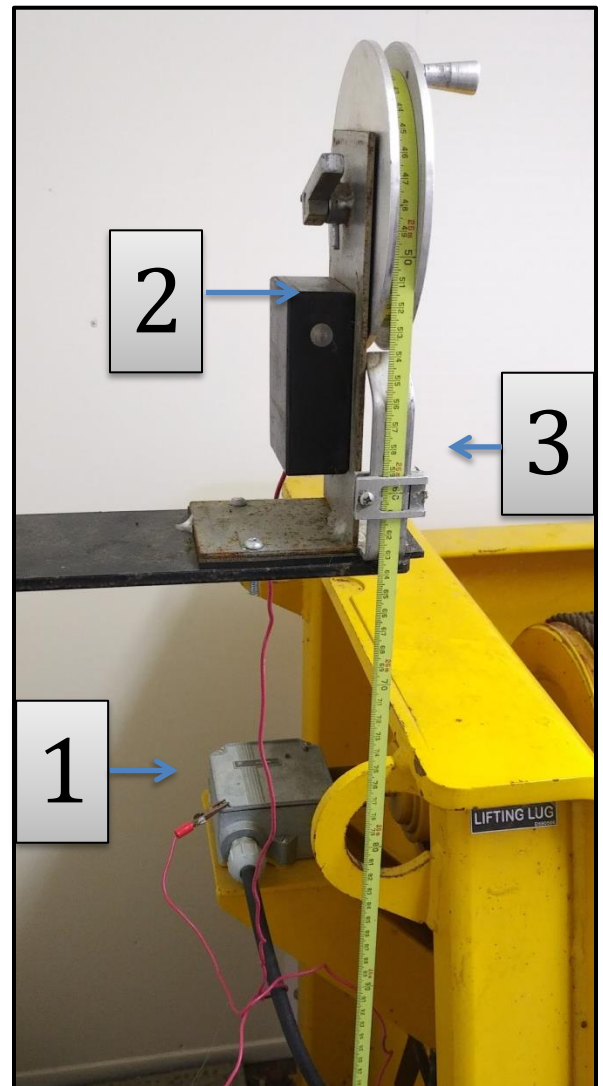
(see instructions below)

Step 1:

$$30 - (\text{E.C.G. reading}) = \text{"X"}$$

Step 2:

$$395.560 - \text{"X"} = \text{Lake level}$$





4 - Completing Morning Report

I: Daily handwritten Logbook

- Prior to inputting the data and completing the report, prepare the daily log book, located on the desk in front of the monitor. Go to today's date and write in all the initials on the left hand side of the page, as shown below.

LL = Lake level (Meters)

St = Storage Level of lake

IN = Today's Inflow (CMS)

DIS = Today's discharge (CMS)

T = Daily Temperature for last 24hrs (**HIGH / LOW**)

P = Daily Precipitation for last 24hrs

W = Today's Weather comment

G = Gate setting levels at current time (leave a space to allow all 4 gate levels being inputted)

TD = Turbine Discharge, current turbine discharge

M = Moorefield Gauge Reading

UD = Uper Drayton Gauge Reading

D = Drayton Gauge Reading

G = Glen Allan Gauge Reading

TBO = Turbine output (**kW's** **Guide vane degrees** (*Angular Position*) **Total Production**)

GPM = Current GPM's for the turbine water bearing flow

TWD = Tail Water Discharge

NOTE: IF AN EXAMPLE IS NEEDED, USE PAST LOGS AS A REFERENCE.

- You will be filling in all the fields as you go through the morning report process.

II: Accessing and computer start up

- To complete the morning report, start by pressing Ctrl+Alt+Delete to view the “log on screen”. Login to “**CONESTOGO-DAMPC\executive**” by entering the password, “grca1974” to gain access.
- Access the “**Data Collection file**” which is located on the desktop (*Fig 1*).

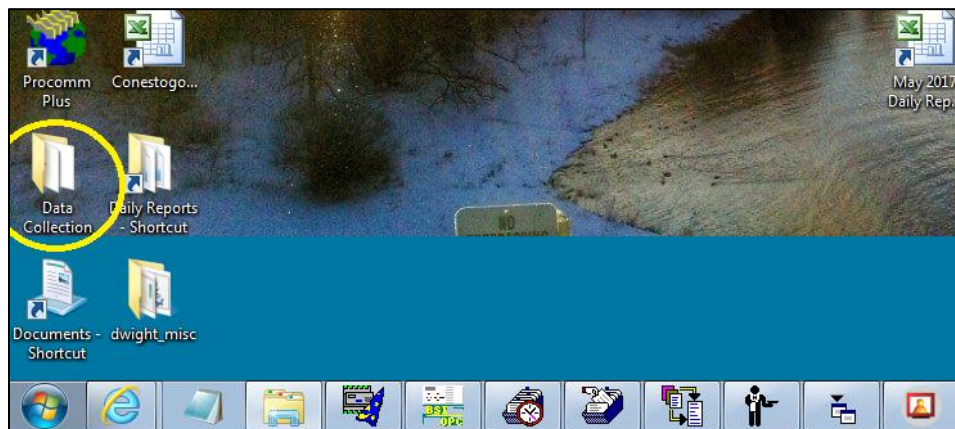


Fig 1

- Open the file folder, click on “**#8 Conestogo Daily report sheet**” (*Fig 2*).

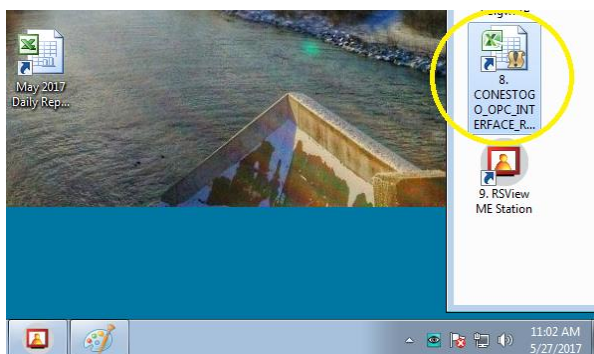
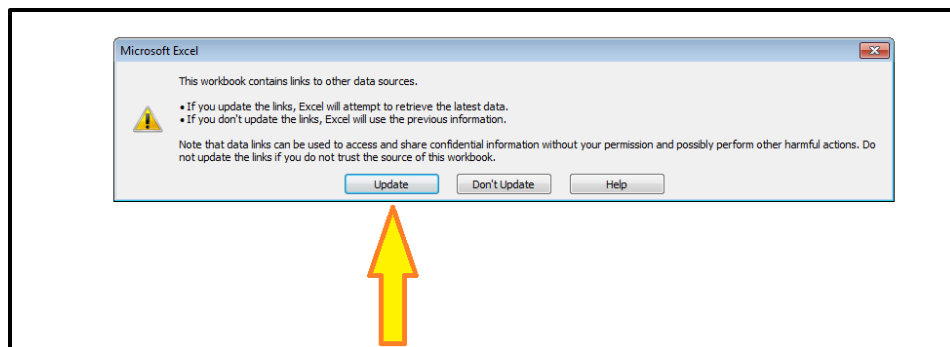


Fig 2

- A Microsoft Excel window will appear giving you three options. Select the “**Update**” button to update to current report status (*Fig 3*).



- Once the workbook is open, update data by selecting the **“New Operational Report”** button on top left side of spreadsheet, and then select **“OK”** on the pop-up window to update (Fig 4).

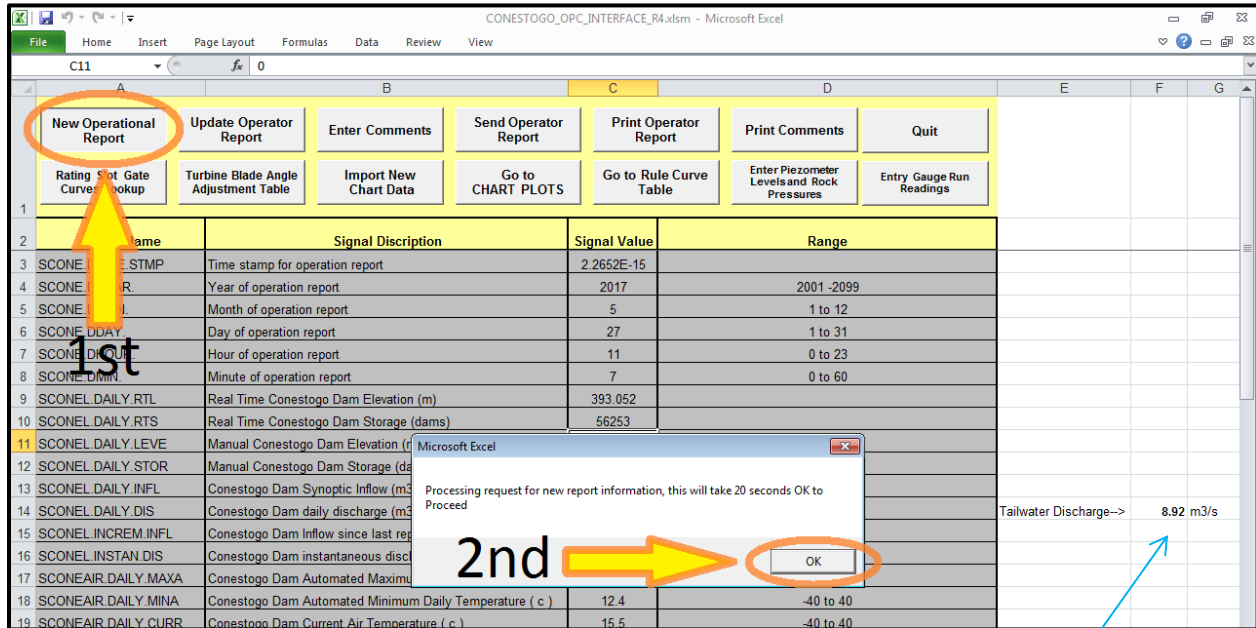


Fig 4

TAILWATER DISCHARGE VALUE

- Once updated, the screen will do a quick blink. Confirm that the date and time is correct before proceeding. If it is not, the ‘Day of operation report’ and the ‘Hour of operation report’ cells will be highlighted in red. If so, see **Troubleshooting** in Section 6 (page 20) to correct the problem. If spreadsheet has updated properly, you are ready to continue and finish the morning report.
- Record the **“Tailwater Discharge”** value into the written daily logbook beside **“TWD”** (Fig 4), found on **Line 14** of the spreadsheet to the right of the report’s main columns (Fig 3).

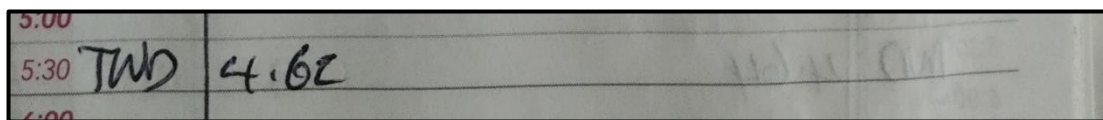


Fig 3

III: Data input into Computer and Logbook

LL = Lake Level:

Line #9 of the spreadsheet is the “Real Time Conestogo Dam Elevation,” which is computer generated. However, always use the elevation calculated from the manual ECG reading. Input the manual Lake Level reading in cell Line # 11 in the excel spreadsheet and record in the daily log beside “LL” (Fig 1 & 2).

Signal Name	Signal Description	Signal Value	Range
SCONE DYEAR	Year of operation report	2017	2001-2099
SCONE DMON	Month of operation report	5	1 to 12
SCONE DDAY	Day of operation report	27	1 to 31
SCONE DHOUR	Hour of operation report	11	0 to 23
SCONE DMIN	Minute of operation report	9	0 to 60
SCONEL DAILY RTL	Real Time Conestogo Dam Elevation (m)	393.052	
SCONEL DAILY RTS	Real Time Conestogo Dam Storage (dams)	56253	
SCONEL DAILY LEVE	Manual Conestogo Dam Elevation (m)	0.000	
SCONEL DAILY STOR	Manual Conestogo Dam Storage (dams)	0	Lookup Lake Storage
SCONEL DAILY INFL	Conestogo Dam Synoptic Inflow (m ³ /s)	5.8	-10 to 1000
SCONEL DAILY DIS	Conestogo Dam daily discharge (m ³ /s)	7.1	0 to 1000
SCONEL INCREM INFL	Conestogo Dam Inflow since last report (m ³ /s)	9.7	-10 to 1000
SCONEL INSTAN DIS	Conestogo Dam instantaneous discharge (m ³ /s)	3.3	0 to 1000

Fig 1

INPUT MANUAL LAKE ELEVATION

OP: Jan-willem Laros

+494
 LL 372.756
 ST 55594
 IN 9.2 cm/s
 DIS 3.5 cm/s
 T 12° 10.5°
 P 15.2 mm R
 W overcast

Fig 2

WRITE IN MANUAL LAKE ELEVATION

ST = Lake Storage level:

Select the empty cell on Line # 12 of spreadsheet. Once cell is highlighted select the “Look Up Storage” button to the right of cell, this will generate the current storage level automatically. Record the storage value into the daily log beside “ST”. (Fig 3 & 4)

Signal Name	Signal Description	Signal Value	Range
SCONE DYEAR	Year of operation report	2017	2001-2099
SCONE DMON	Month of operation report	5	1 to 12
SCONE DDAY	Day of operation report	27	1 to 31
SCONE DHOUR	Hour of operation report	11	0 to 23
SCONE DMIN	Minute of operation report	9	0 to 60
SCONEL DAILY RTL	Real Time Conestogo Dam Elevation (m)	393.052	
SCONEL DAILY RTS	Real Time Conestogo Dam Storage (dams)	56253	
SCONEL DAILY LEVE	Manual Conestogo Dam Elevation (m)	0.000	
SCONEL DAILY STOR	Manual Conestogo Dam Storage (dams)	0	Lookup Lake Storage
SCONEL DAILY INFL	Conestogo Dam Synoptic Inflow (m ³ /s)	5.8	-10 to 1000
SCONEL DAILY DIS	Conestogo Dam daily discharge (m ³ /s)	7.1	0 to 1000
SCONEL INCREM INFL	Conestogo Dam Inflow since last report (m ³ /s)	9.7	-10 to 1000
SCONEL INSTAN DIS	Conestogo Dam instantaneous discharge (m ³ /s)	3.3	0 to 1000

Fig 3

CLICK ON EMPTY CELL TO HIGHLIGHT AND CLICK “LOOKUP LAKE STORAGE”

OP: Jan-willem Laros

+494
 LL 372.756
 ST 55594
 IN 9.2 cm/s
 DIS 3.5 cm/s
 T 12° 10.5°
 P 15.2 mm R
 W overcast

Fig 4

WRITE IN STORAGE LEVEL

NOTE: BEFORE YOU CALCULATE THE INFLOW, YOU NEED TO ACQUIRE THE CORRECT DISCHARGE FROM THE LAST 24 HOURS.

DIS = Todays Discharge:

- Under normal conditions, the discharge will generally be consistent from day to day. To find out what the discharge should be, refer back to the previous day in the daily log beside “DIS”.
- When the dam is discharging water through the turbine only, depending on lake level, the discharge ranges between 2.5 m³/s – 4.0 m³/s
- If the discharge has changed between the last daily morning report (±24 hours), you will need to calculate the average discharge, using the following calculation:

- ❖ i.e. Previous day daily report at 0800 hours, discharge was = 10m³/s
 At 14:00 hours that same day (6 hours later), discharge changed to = 5m³/s
0800 hours the next the next day, use the following equation:
 $10 \text{ (m}^3\text{/s)} \times 6 \text{ (hours)} = 60$
 $5 \text{ (m}^3\text{/s)} \times 18 \text{ (hours)} = 90$
 Total discharge = 60 + 90 = **150**
 Avg. discharge = **150** ÷ 24 (hours) = **6.25**

Therefore, the average discharge since the last daily morning report is 6.25m³/s.

NOTE: YOU WILL NOT ALWAYS DIVIDE BY 24 HRS WHEN CALCULATING AVG. DISCHARGE, AS THIS NUMBER IS DEPENDENT ON THE TIME BETWEEN SENDING IN REPORTS. EXAMPLE, IF YOU ARE COMPLETING A 1600 REPORT, DIVIDE TOTAL DISCHARGE BY 8 HOURS.

- To back up the current discharge flow, locate and select “Rating Slot Gate Curves Lookup” icon (Fig 5). Then update lake level, gate settings and turbine discharge (check daily log) information on spreadsheet to accurately obtain your total current discharge (Total Outflow, Fig 6).

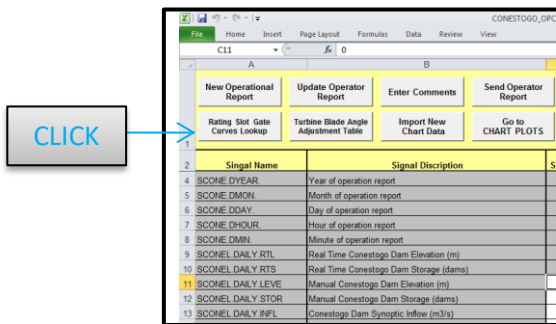


Fig 5

FILL IN LAKE LEVEL AND CURRENT GATE OPENNINGS

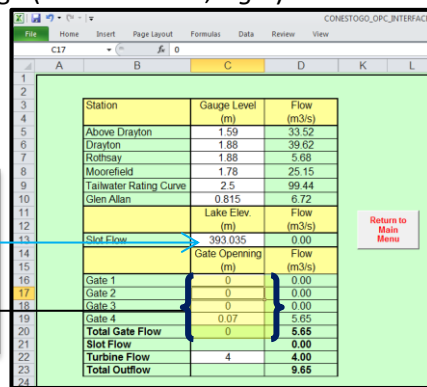


Fig 6

- Once the discharge value has been obtained and it has not changed since the last report, input the value into the spreadsheet on **Line 14 and 16** (Fig 7).
- However, if the discharge has changed since the last daily morning report, the calculated average discharge value must be inputted in the “daily discharge” (average discharge) on “**Line 14**” of the spreadsheet. The “current discharge” (instantaneous discharge) has to be inputted in “**Line 16**” of the spreadsheet (Fig 7).

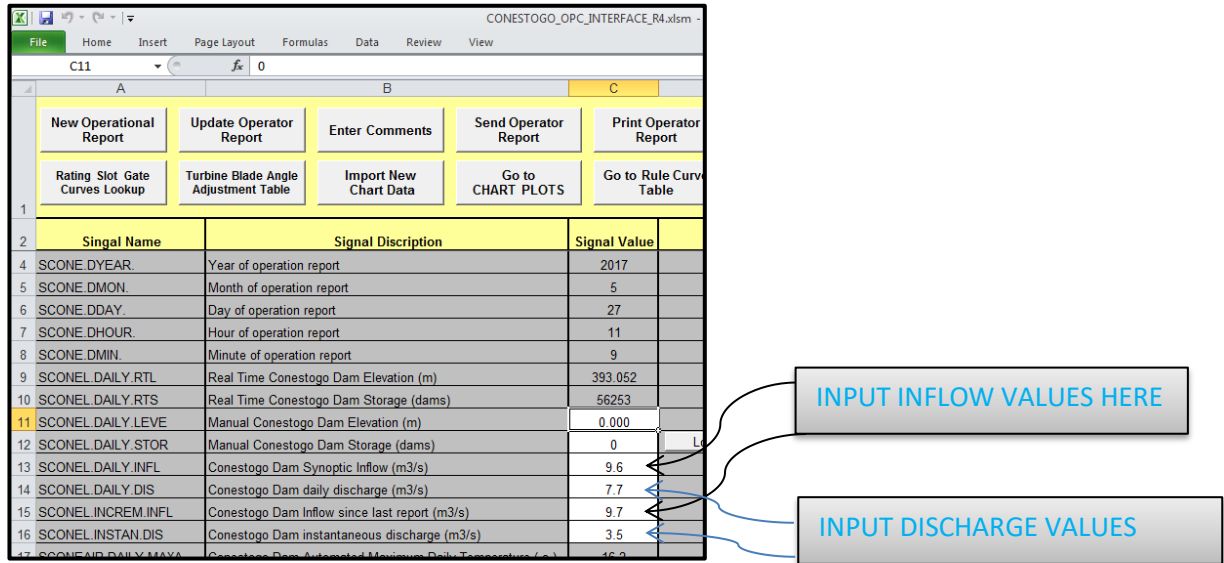


Fig 7

- Once inputted to the computer, write the discharge value in the daily log beside “**DIS**” (Fig 8).

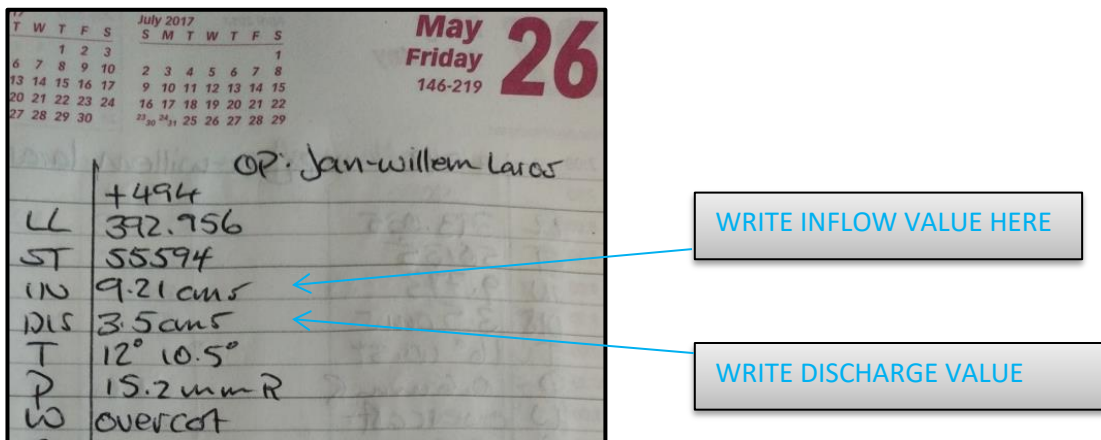


Fig 8

IN = Today's Inflow:

- Before calculating the inflow, the “**change in storage**” between yesterday’s daily report and now has to be calculated. Use the following calculation to obtain change in storage:

$$(Current\ storage) - (yesterday's\ storage) = \text{“change in storage” (+ or -)}$$

- The inflow value to be reported is based on the discharge from the dam and change in storage of the reservoir.
- The inflow value is calculated from the following equation: **(Does not work on smartphone, use analog calculator provided)**

$$(k\ factor) \times (Discharge) + or - (change\ in\ storage) \div (k\ factor) = inflow$$

The K factor is a value for the time since your last report, and a conversion between cubic meters and 1000’s m³. **Note:** That K = 3.6 x hours since last report. The values for “K” are as follows.

Hours since last Report	K	Hours since last report	K
1	3.6	13	46.8
2	7.2	14	50.4
3	10.8	15	54.0
4	14.4	16	57.6
5	18.0	17	61.2
6	21.6	18	64.8
7	25.2	19	68.4
8	28.8	20	72.0
9	32.4	21	75.6
10	36.0	22	79.2
11	39.6	23	82.8
12	43.2	24	86.4

- It is possible that in the summer, due to evaporation losses from the lake, you may calculate a value less than zero for the inflow. This is acceptable and should be recorded as a negative value.

Example of an inflow calculation.

Discharge value:	3.5cms	$86.4 \times 3.5 - 25 \div 86.4 = \mathbf{3.21}$ 3.21cms is the inflow.
Change in storage value:	-25	
“K” factor value:	86.4	

- Input the calculated inflow value in “**Lines 13 and 15**” of the spreadsheet and write it in the daily log beside “**IN**” (Fig 7 & 8).

T, P, and W = Temperature, Precipitation and weather:

- This is where the info from the daily weather log is used which was completed in section 1.
- The weather info will be entered in the following way in the spreadsheet (Fig 1):
 - i. **HIGH** Temperature to be entered on “**Line 21**” on the spreadsheet. (since last morning report)
 - ii. **LOW** Temperature to be entered on “**Line 22**” on the spreadsheet. (since last morning report)
 - iii. Daily rainfall total (Total rainfall since last daily morning report) will be entered on “**Line 23**”
 - iv. Daily snowfall total (Total snowfall since last daily morning report) will be entered on “**Line 24**”
 - v. Today’s weather observation, that you observed earlier at the shop, will be entered on “**Line 25**” by using the drop-down menu located to the right of the empty cell, choose the appropriate observation.
- ❖ (Fill in **Line #26 and #27** if there is any significant wind or snow drifting at current reporting time.)

Signal Name	Signal Description	Signal Value	Range
SCONE DYEAR	Year of operation report	2017	2001-2020
SCONE DMOH	Month of operation report	5	1 to 12
SCONE DDAY	Day of operation report	27	1 to 31
SCONE DHOHR	Hour of operation report	11	0 to 23
SCONE DMIN	Minute of operation report	9	0 to 60
SCONEI DAILY RTL	Real Time Conestogo Dam Elevation (m)	393.052	
SCONEI DAILY RTS	Real Time Conestogo Dam Storage (dam)	5623	
SCONEI DAILY LEVE	Manual Conestogo Dam Elevation (m)	0.000	
SCONEI DAILY STOR	Manual Conestogo Dam Storage (dam)	0	Lookup Lake Storage
SCONEI DAILY INFL	Conestogo Dam Synoptic Inflow (m ³ /s)	9.6	-10 to 100
SCONEI DAILY DIS	Conestogo Dam daily discharge (m ³ /s)	7.7	0 to 100
SCONEI INSTAN INFL	Conestogo Dam Inflow since last report (m ³ /s)	9.7	-10 to 100
SCONEI INSTAN DIS	Conestogo Dam instantaneous discharge (m ³ /s)	3.5	0 to 100
SCONEAR DAILY MAXA	Conestogo Dam Automated Maximum Daily Temperature (c)	16.2	-40 to 4
SCONEAR DAILY MINA	Conestogo Dam Automated Minimum Daily Temperature (c)	12.4	-40 to 4
SCONEAR DAILY CURR	Conestogo Dam Current Air Temperature (c)	15.3	-40 to 4
SCONRAN DAILY AUTO	Rainfall total since 0000 in (mm)	0.0	0 to 100
SCONEAR DAILY MAXM	Conestogo Dam Manual Maximum Daily Temperature (c)	0	-40 to 4
SCONEAR DAILY MINM	Conestogo Dam Manual Minimum Daily Temperature (c)	0	-40 to 4
SCONRAN DAILY MANR	Conestogo Dam Manual Daily Rainfall (mm)	0	0 to 250
SCONSNOW DAILY MANR	Conestogo Dam Manual Daily Snowfall (cm)	0	0 to 100
SCONE WEATHE COMB	Conestogo Dam Weather Comment		
SCONE SNOWDR INT	Conestogo Dam Drifting Intensity	0	0 to 3
SCONE SNOWDR DIR	Conestogo Dam Drifting Direction	0	0 to 37

Fig 1

July 2017
 T W T F S S M T W T F S
 1 2 3 1
 6 7 8 9 10 2 3 4 5 6 7 8
 13 14 15 16 17 9 10 11 12 13 14 15
 20 21 22 23 24 16 17 18 19 20 21 22
 27 28 29 30 23 24 25 26 27 28 29

May Friday 20
146-219

OP: Jan-willem Laros

+494

LL 392.756

ST 55594

IN 9.21 cm/s

DIS 3.5 cm/s

T 12° 10.5°

P 15.2 mm R

W overcast

Fig 2

INPUT ALL THE WEATHER VALUES,
LISTED ABOVE IN STEPS i-v

INPUT ALL THE WEATHER VALUES,
LISTED BELOW IN STEPS i-v

- The weather info will also be written into the daily log (Fig 2).
 - i. **HIGH** and **LOW** temperature will be written beside the “**T**”
 - ii. Daily total precipitation will be written beside the “**P**”
 - iii. Today’s weather observation will be written beside the “**W**”

G & TD = Gate setting level and Turbine Discharge:

- when the spreadsheet gets updated, each gate opening value will be automatically generated in its corresponding cell in the spreadsheet. **Lines #28 to #31.**
- “Turbine discharge” is manually inputted on “**Line 32**”.
- “Bypass Discharge”, which is total discharge through gates only (doesn’t include turbine discharge) will be manually inputted on “**Line 33**”. There might be a number already there, be sure to verify and backup by using the “**Rating Slot Gate Curves Lookup**” function. (see page 9, Fig 5 & 6)

9	SCONEL DAILY_RTL	Real Time Conestogo Dam Elevation (m)	393.052	
10	SCONEL DAILY_RTS	Real Time Conestogo Dam Storage (dams)	56253	
11	SCONEL DAILY_LEVE	Manual Conestogo Dam Elevation (m)	0.000	
12	SCONEL DAILY_STOR	Manual Conestogo Dam Storage (dams)	0	Lc
13	SCONEL DAILY_INFL	Conestogo Dam Synoptic Inflow (m3/s)	9.6	
14	SCONEL DAILY_DIS	Conestogo Dam daily discharge (m3/s)	7.7	
15	SCONEL INCREM_INFL	Conestogo Dam Inflow since last report (m3/s)	9.7	
16	SCONEL INSTAN_DIS	Conestogo Dam instantaneous discharge (m3/s)	3.5	
17	SCONEAIR DAILY_MAXA	Conestogo Dam Automated Maximum Daily Temperature (c)	16.2	
18	SCONEAIR DAILY_MINA	Conestogo Dam Automated Minimum Daily Temperature (c)	12.4	
19	SCONEAIR DAILY_CURR	Conestogo Dam Current Air Temperature (c)	15.3	
20	SCNRAIN DAILY_AUTO	Rainfall total since 0800 in (mm)	0.0	
21	SCONEAIR DAILY_MAXM	Conestogo Dam Manual Maximum Daily Temperature (c)	0	
22	SCONEAIR DAILY_MINM	Conestogo Dam Manual Minimum Daily Temperature (c)	0	
23	SCNRAIN DAILY_MANU	Conestogo Dam Manual Daily Rainfall (mm)	0	
24	SCNSNOW DAILY_MANU	Conestogo Dam Manual Daily Snowfall (cm)	0	
25	SCONE.WEATHE.COMM	Conestogo Dam Weather Comment	0	
26	SCONE.SNOWDR.DINT	Conestogo Dam Drifting Intensity	0	
27	SCONE.SNOWDR.DIRE	Conestogo Dam Drifting Direction	0	
28	SGATE1.OPENING.TEMP	Conestogo Dam Gate 1 Opening (m)	0	
29	SGATE2.OPENING.TEMP	Conestogo Dam Gate 2 Opening (m)	0	
30	SGATE3.OPENING.TEMP	Conestogo Dam Gate 3 Opening (m)	0	
31	SGATE4.OPENING.TEMP	Conestogo Dam Gate 4 Opening (m)	0.059999995	
32	STURBINE.DISCHA.CONE	Turbine Discharge (m3/s)	0	
33	SBYPASS.DISCHA.CONE	By Pass Discharge (m3/s)	0	

GATE SETTING LEVELS

TURBINE DISCHARGE

BY PASS DISCHARGE

Fig 1

- Gate setting levels and turbine discharge will also be recorded in the daily log. When gates are closed write “C”. Gates setting to be written beside “G” and Turbine discharge beside “TD” (Fig 2)

Handwritten log for May 26, 2017, Friday. The log includes the following entries:

- 00
- 30 +494
- 00 LL 372.756
- 30 ST 55594
- 00 IN 9.21cms
- 30 DIS 3.5cms
- 00 T 12° 10.5°
- 30 P 15.2mm-R
- 00 W overcast
- 00 G CC
- 00 CC
- 00 TD 3.5cms
- 00

OP: Jan-willem Laros

146-219

May Friday 26

GATE LEVEL SETTING AND TURBINE OUTPUT VALUES

Fig 2

Finishing the report spreadsheet:

- The name of the operator who completed the daily morning report, today and the operator who is on call for the coming weekend. This is completed on **Lines #55 and #56** in the spreadsheet. **Line #57** indicates what type of report is being completing. When completing a daily report, choose **“Daily Report”** form the drop-down menu.
- For all three inputs, use the drop-down menus located to the right of each cell and choose the appropriate input (*Fig 1*)

Signal Name	Signal Discription	Signal Value	Range
SDRAYTON.LEVEL.COMM	Drayton Daily Level Comment	0	
SROTHSA.LEVEL.COMM	Rothsay Daily Level Comment	0	
SMOORE.LEVEL.COMM	Moorefield Daily Level Comment	0	
SGLEN.LEVEL.COMM	Glen Allan Daily Level Comment	0	
SCONE.MPREC.COMM	Conestogo Dam Manual Precipitation Comment	0	
SCNRAIN.HOUR.COMM	Conestogo Tipping Bucket Raingauge Comment	0	
SCNAIR.TEMP.COMM	Conestogo Dam Air Temperature Comment	0	
SCONETMP.OPERAT.	Current Operator	1	1 - Dean McFadden
SCONETMP.OPERAT.WKND	Weekend Operator	9	9 - Jan Laros
SCONE.OPERAT.COMM	Conestogo Dam Operator's Comment	1	1 - Daily Report
SGENERAT.PWRKW.CONE	Turbine Output (kw)	448	0 kw to 450 kw
STURBINE.ABLPOS.CONE	Current Blade Position in Degrees	0	8 to 28 degrees

Fig 1

- Once all the data has been inputted into the corresponding cells, the report is finished.
- The report will have to be sent to the head office Control Room and printed for a backup copy at the dam. This is done by selecting the **Print Icon** and the **Send Report Icon** located at top of spreadsheet (*Fig 2*).



Signal Name	Signal Discription	Signal Value	Range
SDRAYTON.LEVEL.COMM	Drayton Daily Level Comment	0	
SROTHSA.LEVEL.COMM	Rothsay Daily Level Comment	0	
SMOORE.LEVEL.COMM	Moorefield Daily Level Comment	0	

Fig 2

IV: Gauge Station Readings

- Below "TD" in the written daily log four sets of letters; "M, UD, D and G" which stand for: **Moorefield, Upper Drayton, Drayton and Glen Allen**. Beside these letters, record the current river level and river flow for each gauge. The readings for each these can be found by logging on to the Bristol Babcock recorder located to right of computer desk above printer. Each location has the two readouts in order.
- To get all the river values, press the "F4" light blue button to exit screen. Then press "F3" button to allow screen to start the readouts. (Fig 1) The system will scroll through a couple different readouts i.e., lake level, lake storage etc. before it gets to the gauge readouts. When you get to the first gauge reading, which will be Moorfield, you can press "F1" to "Hold" level reading until you are able to fill out in your logbook and then "F2" to "Go" again to next reading. Continue holding and going until you have filled out all necessary readings in logbook. In winter months note if the gauge is under Ice Conditions. Fill in IC beside gauge value in logbook (Fig 2).

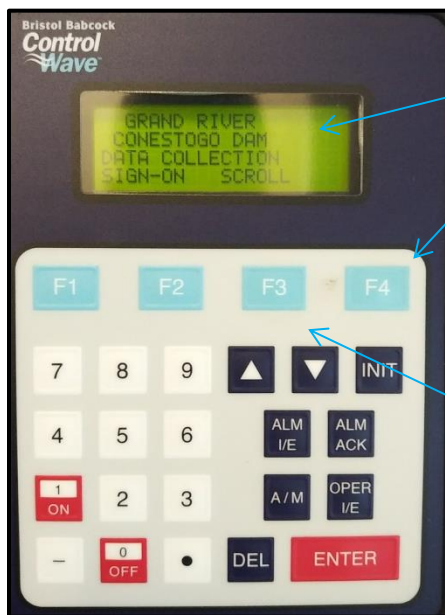


Fig 1

STEP 1: PRESS F4 TO GET TO THIS EXIT SCREEN

STEP 2: PRESS F3 TO START SCROLLING THROUGH THE READOUTS

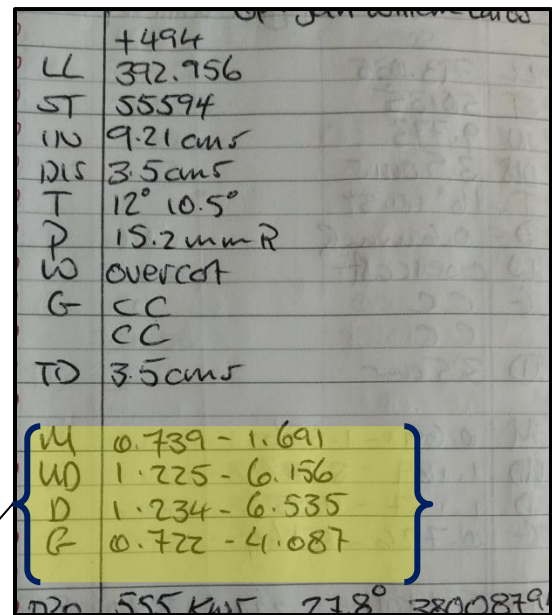


Fig 2

THIS IS WHERE TO WRITE IN THE RIVER READOUT VALUES. THE FIRST NUMBER IS RIVER "LEVEL" THE SECOND NUMBER IS RIVER "FLOW".

V: Turbine Output Data

- This data will be recorded into the daily log beside **“TBO”** and **“GPM”**, and then recorded into the computer in the final step in your morning reporting (see VI: Finishing Daily Report).
 1. To view the data, select the GRCA logo on the **“CONESTOGO DAM GENERATOR STATION”** application window. If the window/application is not visible, select the **“RSView ME station”** icon in the **“Data Collection”** folder (Fig 1).
 2. When the logo is selected, a username and password window will pop up. Enter the credentials, select either the **“User”** or **“Password”** buttons, which will allow you to type in the fields. Enter **op1** for the username and **pass** for the password, then select the arrow button to enter (Fig 2).

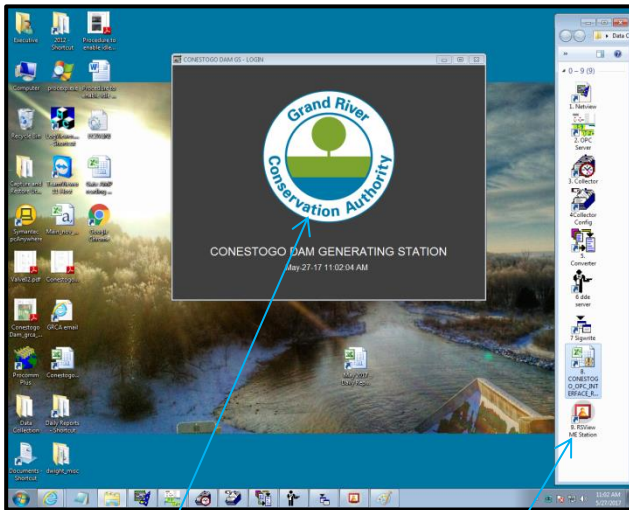


Fig 1

STEP 1. CLICK HERE ON LOGO

IF SCREEN NOT VISIBLE, CLICK THIS ICON

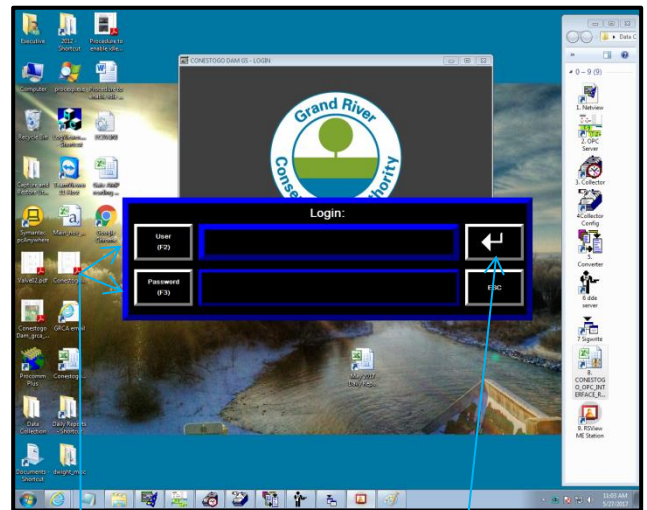


Fig 2

CLICK EITHER BUTTON TO ENTER EITHER CREDENTIALS

WHEN ENTERED, CLICK ENTER

- After successfully logging on, the following screen will pop up. For the basic morning report, the things you need to know are labeled below. (Fig 3)

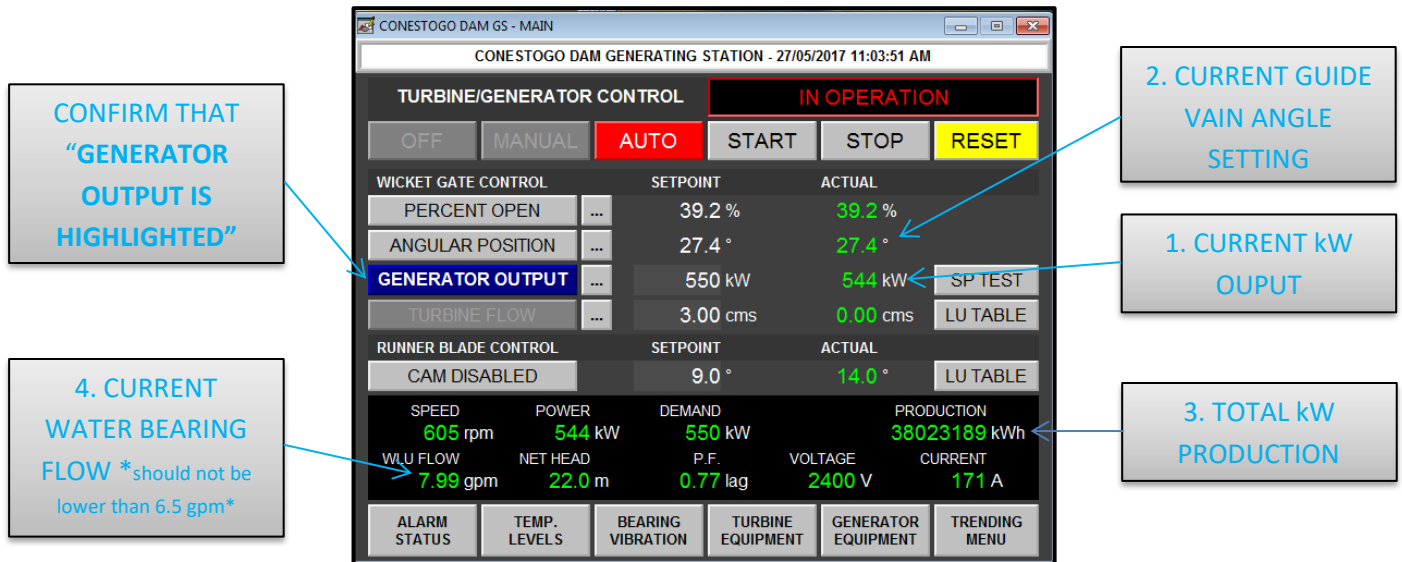


Fig 3

Click to see "Z" Axis vibration

- Value # 1-3 will be written and recorded in the daily log beside "TBO" and value #4 will be written beside "GPM" Example below; (Fig 4)

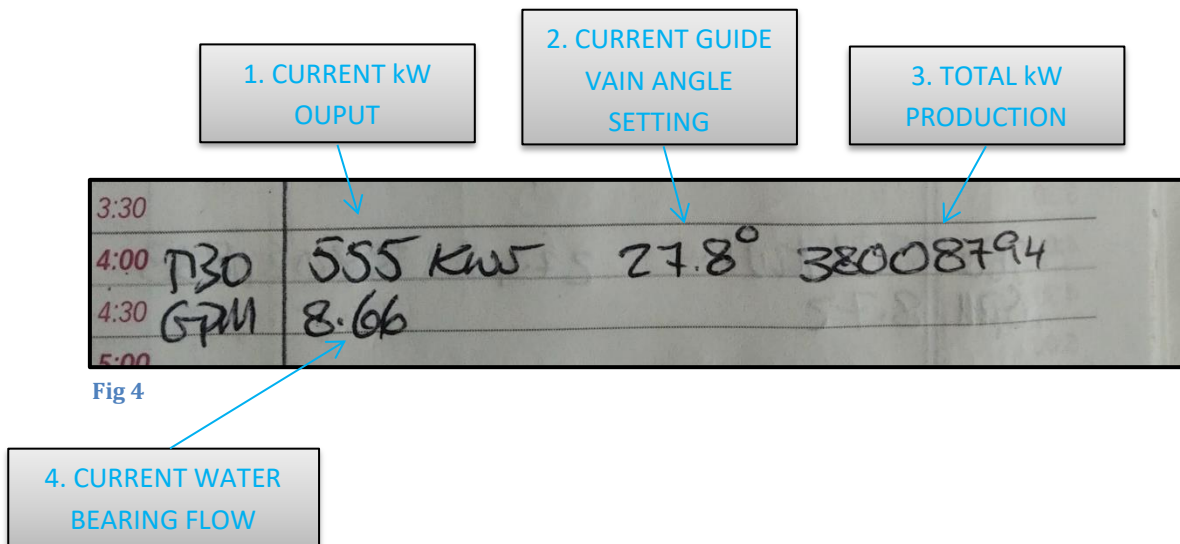
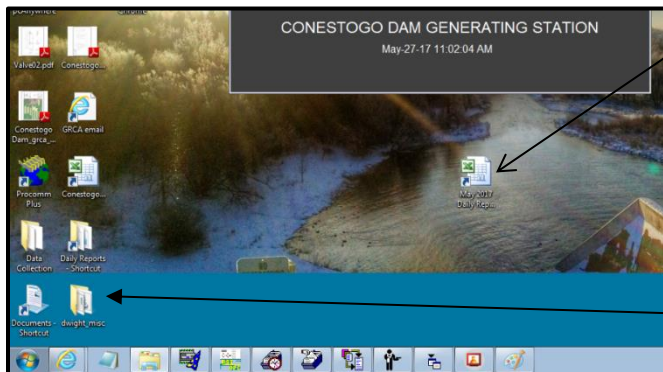


Fig 4

- The last thing to check in before exiting the turbine control panel, is the “Z” axis vibration. To view the “Z” axis value, select the “Bearing Vibration” button on the main interface. (Fig 3) The value is listed beside the “Z” Axis vibration label.
- “Z” Axis vibration must be at 0.04 ips or lower. The vibration value might be fluctuating when you are looking at the display. i.e., between 0.03 ips & 0.04 ips. However, even if the value is fluctuating between 0.04 ips & 0.05 ips, that is undesirable. When an 0.05 ips or higher has been noted, there are two things that ways to correct the problem.
 1. Reduce the generator output until you observe an ips of 0.04 or less.
 2. Change the turbine blade angle. (See “Turbine Operations section, sub-section 5)
 3. Contact senior operator

VI: Finish Daily Reporting

- You have now completed your operations daily spreadsheet and your daily logbook. All that is left is to enter the daily log information into the computer excel sheet to back up report. Select the daily report icon, which should be located in center of desktop screen, just under Turbine screen. If the icon is not found, the file is located in the “Daily Reports” folder, which is also located on the desktop (Fig 1)



DAILY REPORT
COMPUTER BACKUP
REPORT SHEET

“DAILY REPORT
FOLDER” IF FILE NOT
FOUND ON DESKTOP

Fig 1

Unit	Power (kW)	Fuel (kg)	Hours	...
1	382.651	6300	18.413	...
2	292.274	4900	15.449	...
3	382.651	6300	18.413	...
4	422.646	6900	22.000	...
5	382.308	6174	18.080	...
6	382.651	6300	18.413	...
7	382.651	6300	18.413	...
8	382.651	6300	18.413	...
9	382.651	6300	18.413	...
10	382.651	6300	18.413	...
11	382.651	6300	18.413	...
12	382.651	6300	18.413	...
13	382.651	6300	18.413	...
14	382.651	6300	18.413	...
15	382.651	6300	18.413	...
16	382.651	6300	18.413	...
17	382.651	6300	18.413	...
18	382.651	6300	18.413	...
19	382.651	6300	18.413	...
20	382.651	6300	18.413	...
21	382.651	6300	18.413	...
22	382.651	6300	18.413	...
23	382.651	6300	18.413	...
24	382.651	6300	18.413	...
25	382.651	6300	18.413	...
26	382.651	6300	18.413	...
27	382.651	6300	18.413	...
28	382.651	6300	18.413	...
29	382.651	6300	18.413	...
30	382.651	6300	18.413	...
31	382.651	6300	18.413	...
Total				...

- Once daily reports icon is selected, the following window opens (Fig 2). Fill out the corresponding information, save your work and you have now completed your daily reporting. Now you just must do your dam inspection (See next page)



5 - Daily level inspection

Once morning report has been completed, conduct a dam inspection of all levels. This includes:

- Level 1; Main floor, hoist building, turbine hoist building
- Level 2; Furnace/tool room
- Level 3; Turbine control room and turbine gallery (down the steps) and record daily pump hour reading
- Level 4; Sump pumps, record daily pump hour readings.

When you do your inspection, you check for anything that could be considered unusual. Use your senses, sight, smell, noise. When inspecting the sump pumps located in the turbine gallery and on the 4th floor, the hour readings are to be recorded. If hour readings are not increasing as per usual, it is recommended that Water Management Maintenance Staff is contacted, and a more thorough inspection is completed.

NOTE: IF USING THE ELEVATOR TO GO TO EVERY FLOOR, SENT IT DOWN TO THE 4TH FLOOR FIRST AND BRING IT BACK UP, WITHOUT YOU IN IT. IF THE ELEVATOR COMES UP DRY, IT IS SAFE TO GO DOWN TO THE 4TH FLOOR.

At each floor there is an inspection log hung on the wall, where you will have to record what time you were there (example of log sheet, Fig 1)

Once you have completed the inspection, you are all done. Arm and lock up the dam.

Daily Floor Inspection Log				LEVEL: _____	
Date	Time	Observations	Maintenance	By: _____	

Fig 1



6 - Troubleshooting

I: Excel Report sheet wont refresh properly

If the date and time cells will be highlighted in red, the excel sheet did not refresh properly try:

1. updating the sheet again by clicking **“New Operational Report”** as seen on page 7, figure 3.
2. If that doesn't work, close and re-open the excel sheet and update.
3. If that doesn't work, close the excel workbook and all the data collection applications by right clicking on the icon and close it (*Fig 1*).

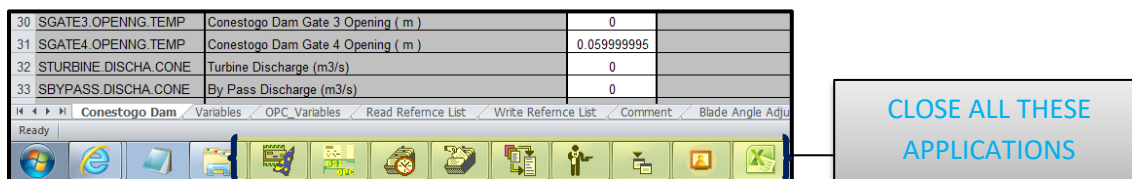


Fig 1

Once these applications are closed, reopen them. You can find all of these applications in the **“Data Collection”** folder as seen on page 6.

4. Once everything is started up, refresh the excel spreadsheet again by clicking **“New Operational Report”**
5. Step 3 & 4 usually will work, if it doesn't, restart the computer and repeat steps 3 & 4.

II: Gate setting discrepancies on morning report excel

If the numbers seem wrong on **“Lines 28 to 31”** as seen on page 13, is most likely means that the gate setting encoders are offline, due to hardware problems. You can manually select the cell and manually enter the gate setting level for now.

III: Turbine flow is low

This can be the result of dropping lake level, which in turns means lower head pressure from the lake. It could also be the result of the filter baskets clogging up. (See “Maintenance Operation,” Sec. 2 (a)) In the case of lowering lake levels, reduce turbine out by 10kW’s at a time, until you get the desired flow. Again, 6.5gpm is the minimum flow acceptable, however, aim to achieve 7 to 7.5 gpm.

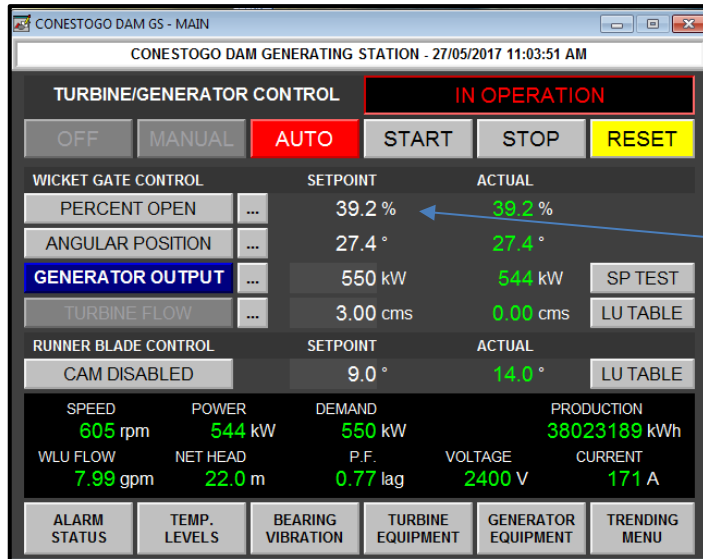


Fig 2

- To lower the kW output, start by selecting **Generator Output “Setpoint”** on the RS viewer (Fig 2)

- This will open a window with a number pad where you will use your cursor to adjust the output values (Fig 3).

- Once in this window, reduce output by 10kW’s at a time to get the desired flow of 7 to 7.5gpm

- Example: if the current output is 550kW’s, but the flow is getting low, select the 540kW’s and select the enter button, located on the bottom right of the number pad. Observe what the flow does and if more flow is needed, repeat the above until you get the desired flow.

- The lowest output the turbine can go is about a 100kW’s

- Another option is to change the blade angle setting. This action is typically ordered by a senior engineer. (See “Turbine Operations,” Sec. 6) for instructions.

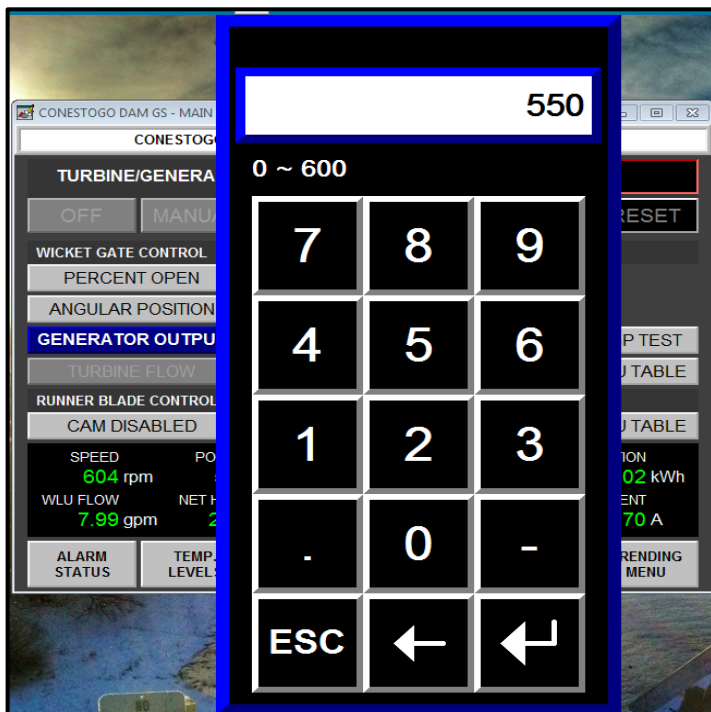


Fig 3