



Barr River hydro scheme

Monthly report – January 2022

1 Summary

January 2022 was a relatively dry month compared to long term averages. This was reflected in a reduction in generation generally. After a period of reliable operation the SCADA PC became unstable and was unavailable for several days in the middle of the month, leading to a loss of data for that period. The plant continued to operate and the PC was replaced towards the end of the month. Several grid outages occurred, the plant recovered from most automatically after alarms were reset, however one outage caused a generator breaker trip which required site attendance to reset.

2 Monthly generation & revenue

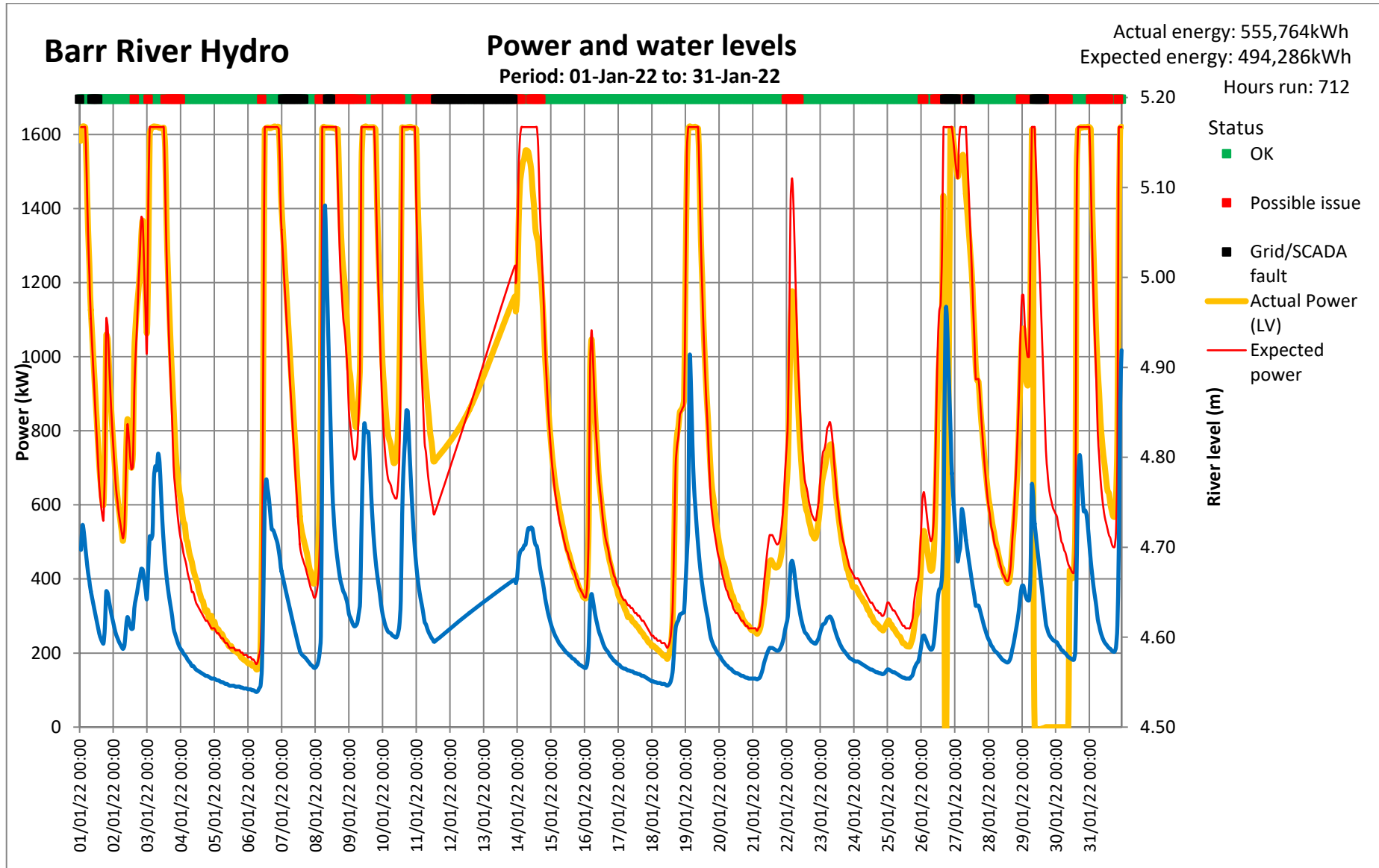
Parameter	Value
Actual generation (FIT meter), kWh	555,764
Average generation in month, kWh	555,764
Forecast generation in month (P50), kWh	783,000
Actual relative to forecast	71.0%
Rainfall relative to 1991-2020 average by month	58.0%
Calculated generation ¹ kWh	494,286
Actual relative to calculated generation, kWh	61,478
Actual relative to calculated generation, %	+12.4%
Approximate revenue in month ²	£72,273

¹ Calculated generation is based on river level data and seeks to establish the expected generation with no performance issues. The expected power and energy calculations are being calibrated and will be refined over the coming months as more data is gathered.

² Export revenue based on generated output and estimated export rate.

Export meter	Value
Export, kWh	552,551
Variance to generation, kWh	-3,213
Variance to generation, %	-0.6%

3 System reporting



3.1 Scheme anomalies to calculated generation

Date/time	Details	Action required
Throughout month	Issues with SCADA reporting lead to a nil return of river level data used to calculate expected generation and therefore a discrepancy to the actual figure which is retrieved when the SCADA system comes back on line. In January this equates to c. 80,000kWh of generation discrepancy.	New SCADA PC installed on 27/1/22 by John. Monitor for ongoing issues.
26/01/22	Two grid outages.	Alarms reset by John, plant restarted when grid returned.
29/01/22 17:00 - 30/01/22 08:00	Grid outage, generator breaker tripped.	Generator breaker reset by Bob Jones.
02/01/22 23/01/22 26/01/22	Power less than expected, due to more water available at intake 2 than intake 1.	Check chamber 2 sensor calibration to confirm spill level.
All other instances in the month	Associated with the scheme either powering up or down (where momentary values are compared to averages for the hour time slot).	None

3.2 Other system events

Date/time	Details	Action required
27/01/22	MN3 and MN5 screens removed for correction of screen orientation problem.	Screens to be replaced (screens are ready, waiting for suitable weather window).

3.3 Head loss

Target head loss at full power	Current head loss at full power	Status
14.5m	12.95m	Marginal increase from previous month. Better than specified (as expected for a new pipeline).

3.4 Temperatures

Parameter	Temperature at or near full power, °C	Alert level, °C	Parameter	Temperature at or near full power, °C	Alert level, °C
Generator DE bearing	31	85	Generator winding 1	60	145
Generator NDE bearing 1	35	85	Generator winding 2	57	145
Generator NDE bearing 2	38	85	Generator winding 3	61	145
Turbine room	17	30	Power cabinet (RG1)	29	42

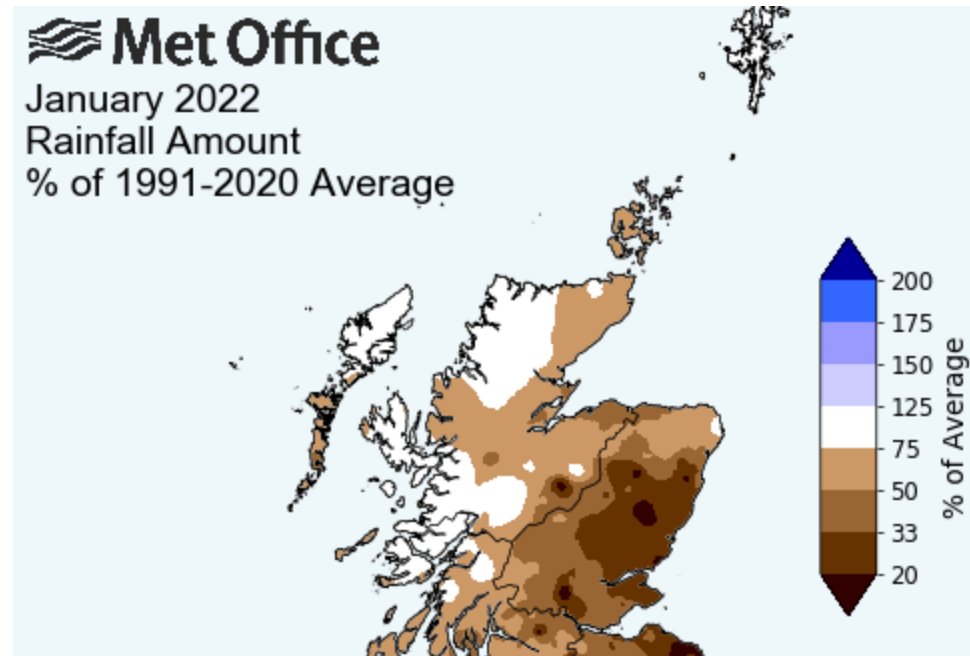
3.5 Vibration

Parameter	Vibration at or near full power, mm/s	Alert level, mm/s	Parameter	Vibration at or near full power, mm/s	Alert level, mm/s
Generator DE	0.38	3.0	Generator NDE	1.22	3.0

4 Recommended and ongoing actions

Action	Responsibility	Status
Fuses to be labelled clearly in X91 (signal cable junction box in powerhouse)	MorVolts	Ongoing
Check chamber 2 level sensor calibration to confirm spill level	GHC	Target level under review to reduce spill risk. As built data now received, John to review chamber target level and adjust if necessary.
Chase missing export meter data for November and December	MorVolts	Ongoing

5 Rainfall



Rainfall this month (rain gauge), mm	181
Western Scotland rainfall in month with respect to 1991-2020 long term average	58%

6 Scheme annual performance summary

2022	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	YTD
Actual generation kWh	555,764												555,764
Average generation since commissioning	555,764												555,764
Forecast generation (P50)	783,000	655,000	592,000	318,000	186,000	176,000	174,000	237,000	358,000	584,000	634,000	659,000	783,000
Actual relative to forecast	71.0%												71.0%
Rainfall relative to 1991-2020 average	58.0%												58.0%
Calculated generation kWh	494,286												494,286
Variance to calculated generation kWh	61,478	-	-	-	-	-	-	-	-	-	-	-	61,478
Variance to calculated generation %	+12.4%												+12.4%
Approximate revenue	£72,273	£-	£-	£-	£-	£-	£-	£-	£-	£-	£-	£-	£72,273
Capacity factor (monthly)	46.1%												46.1%
Industry wide RoR capacity factor													

