Measurement Error Report
Null Report

SGN

MER SCO16 Glenmavis

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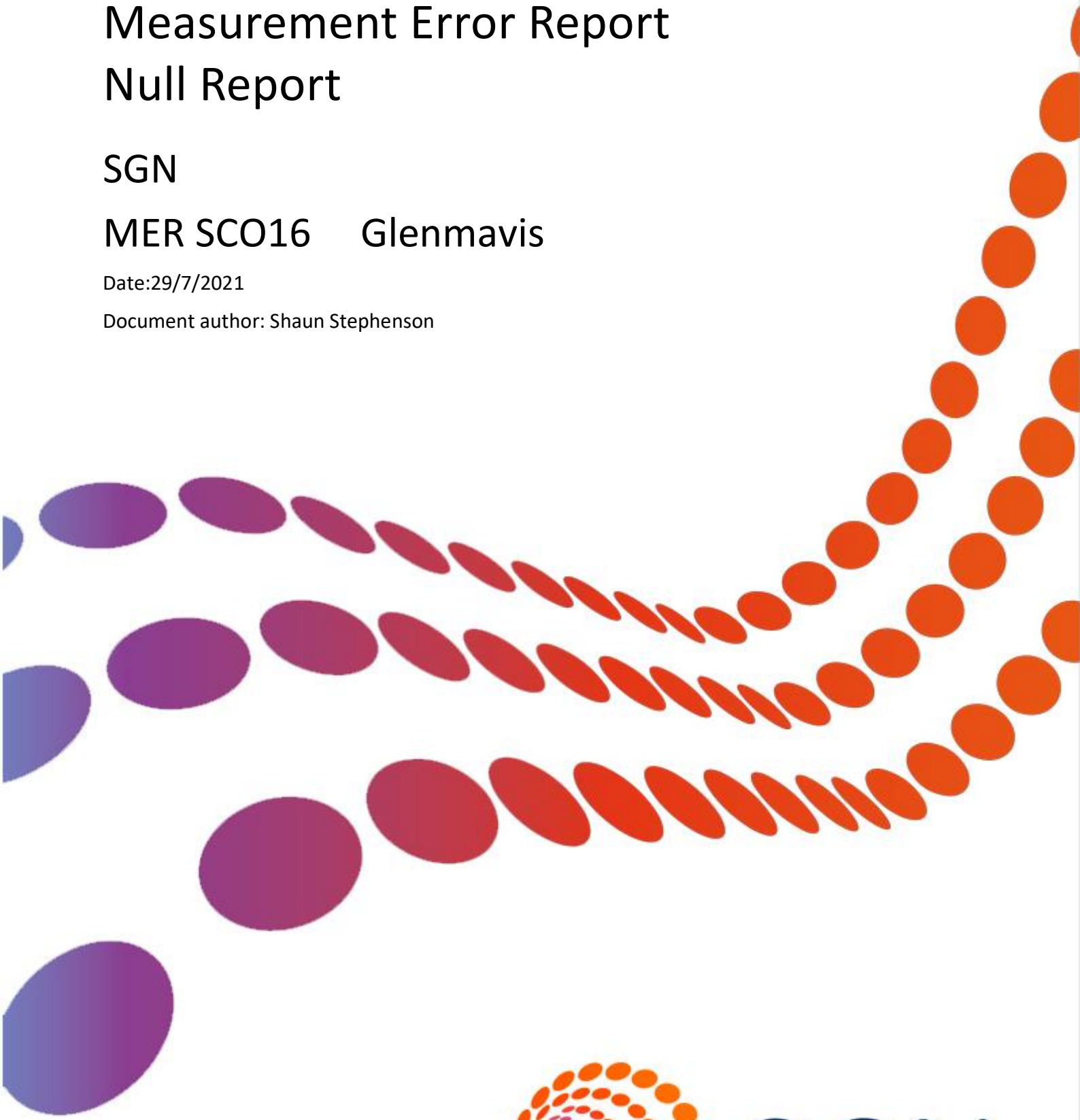

SGN
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Contents

1. Introduction

Due to a SGN transmission pipeline integrity issue following severe weather occurring on the 12th August 2020 a ninety meter section of 18" pipe near Stirling in Scotland was isolated on safety grounds. At the time due to prevailing demand conditions it was necessary to flow the Glenmavis offtake to maintain security of supply requirements on the wider network. The Glenmavis offtake was, at the time, undergoing metering upgrade works to replace the orifice plate metering with ultrasonic metering (USM). As the new USM metering had not been fully commissioned gas was required to flow through the metering bypass which is unmetered.

Estimated flow readings were calculated and submitted to National Grid Gas for 4 gas days and were calculated using historic flow data which matched prevailing site conditions (site temperature, inlet pressure and gas density) at the time of the incident and current and historic demand data. This is a null report to notify of an incident where unmetered gas was required to flow to ensure security of supply on the network.

2. Estimated meter flows:

Estimated metering flows through the Glenmavis Offtake were calculated for the period during which the unmetered bypass was utilised to maintain network supplies. The estimated flow readings were submitted to National Grid Gas within gas day +5 days.

Submitted volumes to National Grid Gas were as follows:

Offtake	Gas Day Date	VOLUME (MSCM)
GLENMAVIS	12-Aug-2020	0.200000
GLENMAVIS	13-Aug-2020	1.827117
GLENMAVIS	14-Aug-2020	2.083000
GLENMAVIS	15-Aug-2020	1.975000

3. Methodology

The method used to estimate the unmetered flow at the Glenmavis Offtake was to utilise historic demand data which was metered under similar site conditions as prevailed during the period the meter bypass was in operation. The following estimated calculated flows were completed during the gas day + 5 day window to allow timely updates to the Gemini system.

Glenmavis Offtake Meter Flow – Estimating Methodology.

12/08/20 – 13/08/20 – On a demand basis, initial figures were estimated by taking total flow for all SGN transmission offtake sites in the Scotland LDZ with telemetry and requesting the SGN team on site at the Glenmavis offtake to set a flowrate to meet the remaining demand requirement for the Scotland LDZ.

14/08/20 – SGN operational teams on site re-established telemetry signalling on the flow control valve points, allowing flow data, including valve positions, instantons flow readings, inlet and outlet pressure readings for the demand conditions. This allowed SGN Gas Control to estimate metering flow values.

See appendix A - table 1.

14/08/20 & 15/08/20 – Historical hourly volume data was taken for the week prior to the incident (04/08/20 to 11/08/20) from the SGN Drum offtake which is located in close proximity to the Glenmavis offtake and would normally supply the demand that Glenmavis offtake supplied during the period 12/08/20 to 15/08/20. These flow figures were subtracted from the historical data at Glenmavis taken from the period in 2019 to establish the estimated flow readings for the period 12/08/20 to 15/08/20 through the Glenmavis offtake.

See appendix A - table 1 & 2.

4. Estimated flow calculations - methodology check.

The last 10 hours of Glenmavis flow data from gas day the 15th August 2019 and compared against metered flows at Glenmavis following the restoration of ultrasonic metering on the 15th August 2020. The most closely aligned site conditions were taken from the 8th August 2020 at Glenmavis and a comparison was made between the two sets flow data. Both sets of data had a demand of 4.84Mcmd (see table B below). The calculated total flow for the check day (8th August 2020) had a minimal difference of 0.002 MSCM/D (see Table A below).

Table A

Date & time	**Glenmavis Actual hourly volumes (MSCM/D) for 15/08/19**	**Calculated hourly volumes (MSCM/D) using historic data from 08/08/20**
15/08/2019 20:00	0.116	0.108
15/08/2019 21:00	0.068	0.071
15/08/2019 22:00	0.089	0.08
15/08/2019 23:00	0.11	0.09
15/08/2019 00:00	0.08	0.074
15/08/2019 01:00	0.07	0.085
15/08/2019 02:00	0.063	0.049
15/08/2019 03:00	0.048	0.075
15/08/2019 04:00	0.07	0.071
15/08/2019 05:00	0.071	0.084
Totals	**0.785**	**0.787**

Table B

Scotland demands

Date	MSCMD
8th August 2020	4.84
9th August 2020	4.99
10th August 2020	5.60
11th August 2020	5.49

5. Appendix A

Table 1

GLEN_O.							14/08/2020		14/08/2020
Time/Date	**P1**	**P5**	**F1**	**FCV1**	**DRUM.F1**	**Glen HVOL**	Drum HVOL	GLEN HVOL - DRUM HVOL	estimated GLEN HVOL
02/08/2019 06:00	64.25	52.35	2.28	**5.34**	**0**	0.09500	0.032	0.06300	0.093
02/08/2019 07:00	63.97	50.86	2.37	**5.36**	**0**	0.09875	0.037	0.06175	0.082
02/08/2019 08:00	63.55	49.71	3.02	**6.08**	**0**	0.12583	0.03	0.09583	0.074
02/08/2019 09:00	63.1	49.64	3.45	**6.61**	**0**	0.14375	0.045	0.09875	0.064
02/08/2019 10:00	62.44	49.99	3.41	**6.71**	**0**	0.14208	0.03	0.11208	0.088
02/08/2019 11:00	62.26	50.45	3.45	**6.82**	**0**	0.14375	0.038	0.10575	0.078
02/08/2019 12:00	63.1	48.07	2.47	**5.38**	**0**	0.10292	0.032	0.07092	0.084
02/08/2019 13:00	63.23	47.39	2.63	**5.58**	**0**	0.10958	0.03	0.07958	0.093
02/08/2019 14:00	63.17	47.52	2.61	**5.51**	**0**	0.10875	0.039	0.06975	0.09
02/08/2019 15:00	63.05	47.96	3.08	**6**	**0**	0.12833	0.028	0.10033	0.096
02/08/2019 16:00	63.13	48.04	3.03	**5.93**	**0**	0.12625	0.035	0.09125	0.09
02/08/2019 17:00	63.24	47	2.49	**5.37**	**0**	0.10375	0.031	0.07275	0.106
02/08/2019 18:00	63.2	45.09	2.42	**5.2**	**0**	0.10083	0.044	0.05683	0.083
02/08/2019 19:00	63.23	43.28	2.35	**5.1**	**0**	0.09792	0.031	0.06692	0.094
02/08/2019 20:00	63.14	41.8	2.33	**5.14**	**0**	0.09708	0.043	0.05408	0.089
02/08/2019 21:00	63.22	40.38	2.06	**4.96**	**0**	0.08583	0.029	0.05683	0.107
02/08/2019 22:00	62.82	42.41	3.91	**6.53**	**0**	0.16292	0.038	0.12492	0.089
02/08/2019 23:00	62.78	45.08	3.97	**6.74**	**0**	0.16542	0.026	0.13942	0.085
03/08/2019 00:00	62.80	48.53	4.01	**7.05**	**0**	0.16708	0.025	0.14208	0.085
03/08/2019 01:00	63.23	48.42	2.51	**5.42**	**0**	0.10458	0.026	0.07858	0.06
03/08/2019 02:00	63.23	49.26	2.63	**5.53**	**0**	0.10958	0.021	0.08858	0.071
03/08/2019 03:00	63.20	51.01	2.83	**6.06**	**0**	0.11792	0.024	0.09392	0.089
03/08/2019 04:00	63.12	52.97	3.05	**6.49**	**0**	0.12708	0.023	0.10408	0.096
03/08/2019 05:00	63.14	54.83	2.95	**6.72**	**0**	0.12292	0.025	0.09792	0.097
							Total DVOL	2.12592	2.08300

Table 2

Date /Time	Regulator Stream	Inlet pressure	FCV position	Outlet pressure	Estimated Flow HVOL
13/8/2020					
06:00	FCV1			48.24	0.093
07:00	FCV1			48.13	0.082
08:00	FCV1			48.27	0.074
09:00	FCV1			47.93	0.064
10:00	FCV1	55.4	39	48.15	0.088
11:00	FCV1			55.47	0.078
12:00	FCV1	56.86	39.6	56.66	0.078
13:00	FCV1	57.9	0	53.86	0.062
14:00	FCV1	52.44	0	47	0.09
15:00	FCV1	59.52	5.4	46.69	0.074
16:00	FCV1	59.2	5.88	45.57	0.0901
17:00	FCV1	57.5	5.47	45.3	0.076
18:00	FCV1	58.46	0	41.82	0.072
19:00	FCV1	55.71	7.1	45.37	0.083
20:00	FCV1	57.82	5.2	45.08	0.063
21:00	FCV1	59.65	0.7	40.59	0.086
22:00	FCV1	59.94	4.6	38.27	0.089
23:00	FCV1	60.22	4.2	37.5	0.07
00:00	FCV1	59.48	5.3	39.33	0.072
01:00	FCV1	60.13	4.6	38.75	0.063
02:00	FCV1	60.51	4.6	38.4	0.071
03:00	FCV1	58.94	7.7	43.74	0.071
04:00	FCV1	59.74	5.4	46.11	0.07
05:00	FCV1	60.09	5.1	46.4	0.068
Total DVOL					1.8271
Date /Time	Regulator Stream	Inlet pressure	FCV position	Outlet pressure	Estimated Flow HVOL
14/8/2020					
06:00	FCV1	60.51	5.1	46.11	0.093
07:00	FCV1	60.67	5.1	44.29	0.082
08:00	FCV1	59.2	9.6	45.89	0.074
09:00	FCV1	59.13	4.8	45.28	0.064
10:00	FCV1	59.58	3.6	45.28	0.088
11:00	FCV1	59.04	7.8	46.3	0.078
12:00	FCV2	58.46	0.1	48	0.084
13:00	FCV2	59.1	11.2	46.59	0.093
14:00	FCV1	61	1.76	45.13	0.09
15:00	FCV1	61	1.77	44.32	0.096
16:00	FCV1	60.36	6	46.27	0.09
17:00	FCV1	60.42	5.72	41.17	0.106

18:00	FCV1	60.03	6.71	46.27	0.083
19:00	FCV1	61.88	16.8	47.17	0.094
20:00	FCV1	59.87	5.52	46.21	0.089
21:00	FCV1	59.61	5.36	46.21	0.107
22:00	FCV1	59.77	4.6	46.29	0.089
23:00	FCV1	59.9	4.71	46.36	0.085
00:00	FCV1	60.19	4.9	46.24	0.085
01:00	FCV1	60.42	5.8	46.4	0.06
02:00	FCV1	60.58	5.5	46.33	0.071
03:00	FCV1	60.64	5.6	46.3	0.089
04:00	FCV1	60.86	4	46.3	0.096
05:00	FCV1	60.86	4	46.27	0.097
Total DVOL					2.083
Date /Time	Regulator Stream	Inlet pressure	FCV position	Outlet pressure	Estimated Flow HVOL
15/08/2020					
06:00	FCV1	61.12	5.8	46.46	0.083
07:00	FCV1	60.83	6.5	46.43	0.074
08:00	FCV1	60.58	5.7	46.21	0.068
09:00	FCV1	60.35	5.7	45.82	0.062
10:00	FCV1	60	6.7	45.37	0.075
11:00	FCV1	59.58	6.7	46.37	0.084
12:00	FCV2	59.74	6.2	46.37	0.092
13:00	FCV2	59.77	6.2	46.17	0.086
14:00	FCV1	60.22	8.2	45.41	0.076
15:00	FCV1	61.84	17.16	48.29	0.07
16:00	FCV1	60.93	2.84	46.24	0.081
17:00	FCV1	60.13	2.59	45.63	0.098
18:00	FCV1	61.88	15.36	47.52	0.092
19:00	FCV1	60.25	3.04	44.48	0.093
20:00	FCV1	59.29	3.84	45.54	0.064
21:00	FCV1	58.11	0	48.35	0.095
22:00	FCV1	59.33	6.2	44.7	0.079
23:00	FCV1	59.29	6.12	46.27	0.107
00:00	FCV1	59.87	5.12	46.27	0.106
01:00	FCV1	60.22	5.12	46.27	0.094
02:00	FCV1	60.64	4.2	46.14	0.087
03:00	FCV1	60.8	4.92	45.28	0.067
04:00	FCV1	60.8	4.96	45.92	0.07
05:00	FCV1	61.15	4.9	46.36	0.072
Total DVOL					1.975