31 January 2017 - Report on WHT primary mirror reflectivity showing the effect of night time entry of mist into dome (night of 30 Jan).

On 30 Jan, a routine measurement on M1 was carried out. Previous measurement was on 9th January.

Next day, information on weather incident from previous night prompted new measurements.

Minima highlighted in red, maxima in green

					%R vs waveband (nm)							Dust Index						
Index	date- time	code	location	Temp/°C (CT7)	365	404	464	522	624	760	970	365	404	464	522	624	760	970
957	30/01/2017 13:47	1	right	21.5	89.2	87.8	87.4	87.8	86.9	84.3	90.6	8.8	8.3	8.9	7.1	8.1	7.4	7.5
958	30/01/2017 13:48	1	right	21.4	89.8	88.2	88.0	88.0	87.2	84.6	90.8	7.8	7.6	7.1	6.4	6.9	6.0	6.7
959	30/01/2017 13:49	1	bottom	21.4	90.9	89.4	89.0	89.2	88.4	85.8	92.2	6.0	5.6	5.7	4.2	4.6	3.7	3.5
960	30/01/2017 13:49	1	bottom	21.4	91.1	89.7	89.4	89.3	88.7	85.9	92.2	5.5	5.0	5.0	4.0	3.9	3.4	3.2
961	30/01/2017 13:50	1	left	21.3	90.7	88.8	88.0	88.6	87.5	84.8	91.4	5.9	6.3	7.6	5.0	6.6	5.7	4.9
962	30/01/2017 13:51	1	left	21.3	91.0	89.5	89.1	89.2	88.4	85.7	91.9	5.6	5.6	5.6	4.2	4.7	3.9	3.9
963	30/01/2017 13:52	1	top	21.2	89.0	87.6	87.0	87.2	86.2	83.5	89.4	7.4	7.5	8.4	6.6	8.2	7.3	7.7
964	30/01/2017 13:53	1	top	21.1	90.6	89.3	88.9	89.0	88.2	85.6	91.7	6.0	5.7	5.4	4.5	4.8	3.9	4.1
	Averages				90.3	88.8	88.4	88.5	87.7	85.0	91.3	6.6	6.5	6.7	5.3	6.0	5.2	5.2
	Ranges				2.1	2.1	2.4	2.1	2.5	2.4	2.8	3.3	3.3	3.9	3.1	4.3	4.0	4.5
	std. deviation				0.8	0.8	0.9	0.8	0.9	0.9	1.0	1.2	1.2	1.5	1.3	1.7	1.6	1.8
	Change since last CO2 (9 Jan)				**0.1**	**0.0**	**0.0**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.1**	**0.1**	**-0.1**	**-0.2**	**-0.3**

Comments: apparent increase in reflectivity w.r.t. 9 Jan may be due to change in sensitivity. Check Reference values below.

This effect might have been reduced by measuring more points, i.e. increased sampling. On 9 Jan, only 7 values were measured.

In any case there is a large range in values, even larger than after CO2 of 9/1. Extreme lows may indicate stains already present.

Measurements on 31st

968	31/01/2017 10:16	1	right	18.3	89.7	88.0	87.4	87.5	86.7	83.9	90.5	7.7	8.0	8.8	7.0	8.3	7.5	7.0
969	31/01/2017 10:17	1	right	18.4	90.0	88.6	87.8	88.5	87.0	84.7	90.9	7.0	7.0	8.0	5.7	7.3	6.1	6.2
970	31/01/2017 10:18	1	bottom	18.4	90.4	89.1	88.8	88.9	88.2	85.6	91.8	6.5	6.2	6.4	4.7	5.3	4.1	3.9
971	31/01/2017 10:19	1	bottom	18.4	90.2	88.9	88.6	88.7	87.8	85.4	91.5	7.0	6.8	7.2	5.2	5.9	4.6	4.6
972	31/01/2017 10:20	1	left	18.5	90.0	88.9	88.6	88.3	87.6	85.0	90.6	6.9	6.6	6.9	5.5	6.6	5.4	6.2
973	31/01/2017 10:21	1	left	18.5	89.6	88.2	87.8	88.0	87.0	84.5	90.3	7.3	7.2	7.9	6.3	7.5	6.5	6.7

974	31/01/2017 10:22	1 top	18.6	89.1	87.6	87.0	87.2	86.3	83.5	89.3	7.6	7.6	8.5	6.8	8.4	7.5	8.1
975	31/01/2017 10:23	1 top	18.6	89.4	88.2	87.7	87.7	86.7	84.3	90.0	8.0	7.4	8.0	7.0	8.1	6.8	7.6
	averages			89.8	88.4	88.0	88.1	87.2	84.6	90.6	7.3	7.1	7.7	6.0	7.2	6.1	6.3
	Ranges			1.3	1.5	1.8	1.7	1.9	2.1	2.5	1.5	1.8	2.4	2.3	3.1	3.4	4.2
	difference from previous day			**-0.5**	**-0.3**	**-0.4**	**-0.4**	**-0.5**	**-0.4**	**-0.7**	**0.6**	**0.7**	**1.0**	**0.8**	**1.2**	**0.9**	**1.1**
	global std. deviation			0.7	0.7	0.8	0.7	0.8	0.8	0.9	1.0	1.0	1.3	1.1	1.5	1.5	1.7
	global std error			0.04	0.04	0.05	0.04	0.05	0.05	0.06	0.06	0.06	0.08	0.07	0.10	0.09	0.11

Conclusion: We estimate the std. error using ALL the measurements, over 2 days. Since the change in average from the previous day is much larger, we can say it's significant. About 0.5% reflectivity was lost due to mist/cloud event. Scattering increased by over 1%. The best measurement after the event is about equal to the average on the day before, while minimum measurement is a recurrence. Note however that while the change is real, it is small compared with the range in values measured.

Comparison of Reference mirror measurements. NB, any discrepancy found does not affect comparison between consecutive days

956	30/01/2017 13:41	0 Gauge	21.4	84.6	83.8	88.6	90.7	89.7	83.5	87.1	2.6	3.2	2.4	1.4	1.1	0.8	1.0
918	07/12/2016 12:25	1 Gauge	12.1	84.5	83.6	88.4	90.6	89.6	83.4	86.7	2.7	3.2	2.8	1.7	1.3	1.0	1.2
	change w.r.t earlier			0.1	0.2	0.2	0.1	0.1	0.1	0.4	-0.1	0.0	-0.4	-0.3	-0.2	-0.2	-0.2

Conclusion: direction and size of change suggests the apparent ~0.1% increases in reflectivity since 9/1 are not significant