

2018 Performance Report including a review of monitoring and assessment

Emissions Trends and Significant Events

Emission of combustion gases from our two units (Unit 10 LCP 234 and Unit 20 LCP 235) was entirely consistent with the running regimes throughout the year and there were no unexplainable variations in the emissions throughout the report period. Our conclusion has been derived from assessment of the trends and data taken from our local CEMS and Envirosoft application, which accompany this report.

The 'Envirosoft' software was used throughout the year to check and record data from our Continual Environmental Monitoring (CEMS) systems. The software was reliable and acquisition of data was accomplished consistently and without problems.

The two combustion units ran throughout the year apart from maintenance outages in August and September.

Emissions to Air – an examination of data from the Envirosoft System

Introduction

Following the practice established in previous reports, two appendices are attached which show graphs of each unit's NO_x output compared to percentage load. (See Appendix 1 for 234 and Appendix 2 for 235) This gives an overall picture of emissions for the year, broken down into 3-month periods. The graphs have been produced using 'Envirosoft' software.

The graphs also show the outages which occurred for Unit 10 (234) in July and August and for Unit 20 (235) in August and September.

- The orange line on the graphs indicates NO_x output in mgNm⁻³. In the graphs, '100' on the vertical axis is equivalent to a concentration of 100mgm⁻³ of NO_x in the exhaust gas.
- The dark blue line shows the unit load in MW.

Review

There were no breaches of emissions limits to report during the year for either of the gas turbines.

Overall, the NO_x trends when the gas turbines are running show a consistent pattern of NO_x production throughout the year for both gas turbines, ranging from 20 to 40 mgNm⁻³ and, there is a strong correlation between load and NO_x emission (see graphs). Both units operated according to instructions from National Grid throughout the year, apart from the outages outlined above. The station continues to be used principally to meet peak power demand with frequent starts for both units.

The CEMS equipment undergoes regular automated recalibration. On most occasions this process takes place without producing anomalous readings. On one occasion this year, an 'autocal' event produced a brief false reading (see Appendix 3). This was investigated and confirmed as a false reading, hence there is one small peak in that month's graph.

Documents illustrating the implementation of proactive and reactive maintenance activities are included as Appendix 4.

Emissions to Water Review

Our main technique for pH monitoring continues to be by use of automated equipment. This is calibrated as part of our quality control processes. The accuracy of the probes is therefore assured in the same way as for all other process-critical measurement systems on site. Written protocols for calibration and maintenance continue to be followed.

We also take some samples and test for pH using wet chemistry. This gives us a backup reading. As in previous years, the processes which we are required to sample are batch discharges. Discharge does not occur unless the water has been tested and found to be within pH limits.

Environmental Permit Compliance – Other Significant Events

- Reports were compiled and submitted to NRW as specified in our Permit in January April, July and October.
- The annual 'PR-TR' online reporting of emissions and waste for the site was prepared and submitted to NRW in March in accordance with regulatory requirements.
- The Annual Surveillance Test (AST) for both of our Continuous Environmental Monitoring Systems (CEMS), took place in June and the sampling contractor's report was sent to NRW.
- All calibration functions in the CEMS met the acceptance criteria for an AST and as such the systems were confirmed as being suitable for continued use.
- The sampling contractors recommended that we continue to monitor the performance of our two NO_x converters, which are part of the CEMS processes.

The inspector from Natural Resources Wales made a scheduled visit on 20th September.

The CEMS equipment was inspected, and found to be in good order. The inspector had no non-compliances to report.

Neighbour Relations and Complaints

No environmental queries or complaints were received in 2018 neither directly from members of the public nor from NRW. Our customer, Calon Energy continued to organise regular meetings with the local community and Siemens participates fully in this process.

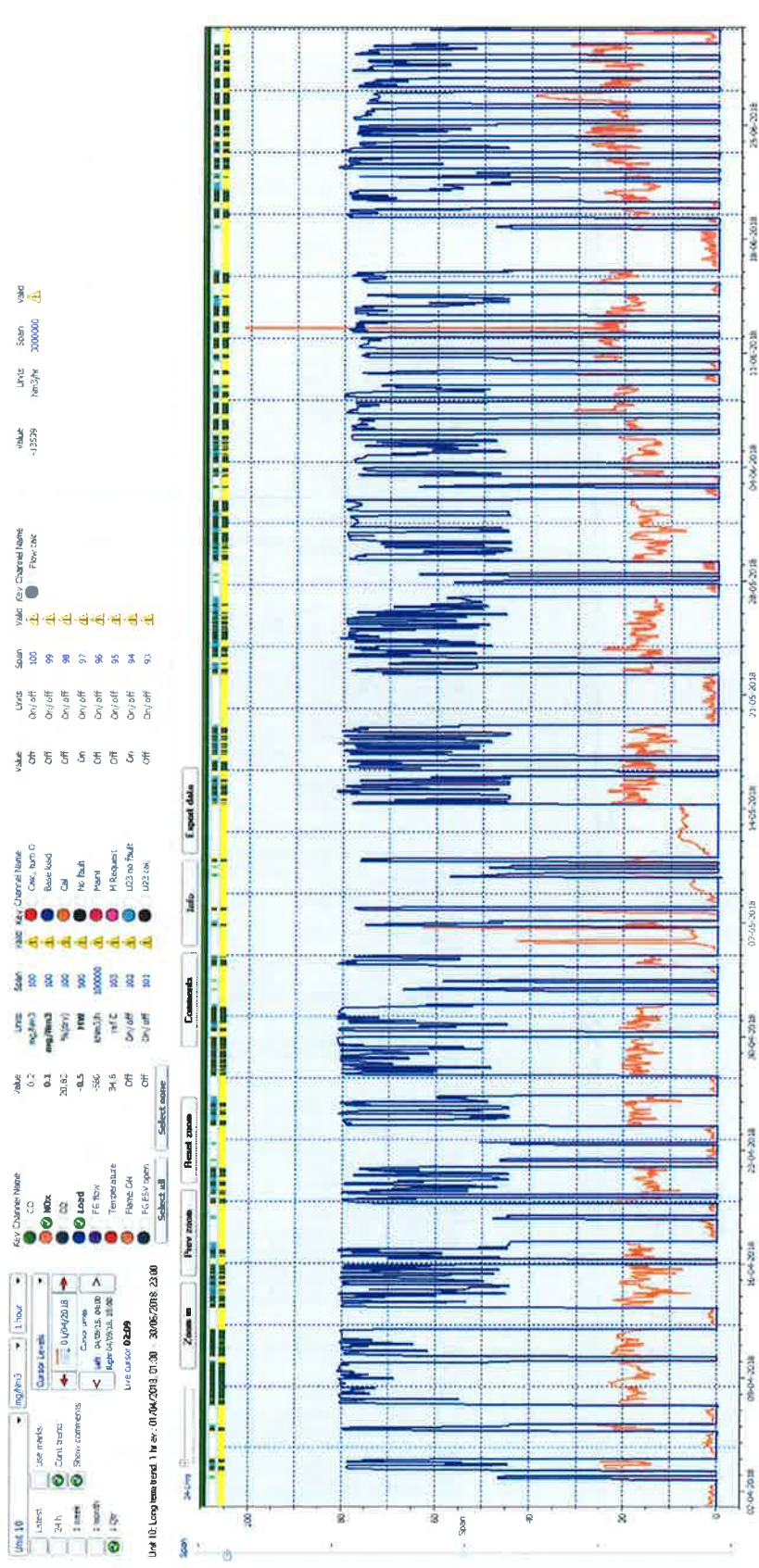
List of Appendices

Appendix 1	Quarterly Trends CEMS Graphs for Unit 10 (LCP 234) 2018
Appendix 2	Quarterly Trends CEMS Graphs for Unit 20 (LCP 235) 2018
Appendix 3	Calibration June 11th, 2018 Peak Reading due to Autocalibration Event
Appendix 4	CEMS maintenance – examples of Proactive and Reactive Maintenance

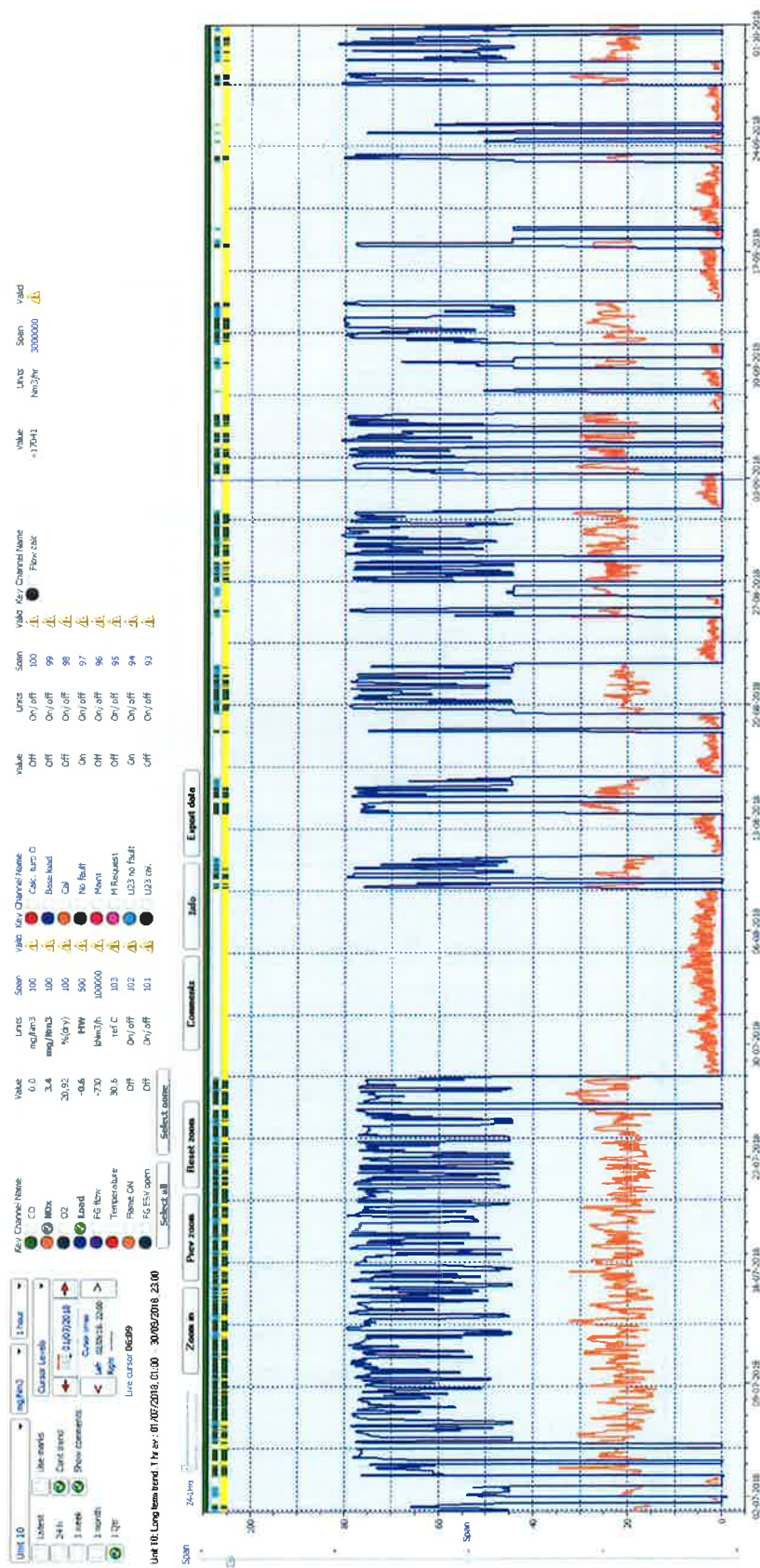
Quarterly Trends CEMS Graphs for Unit 10 (LCP 234) 2018

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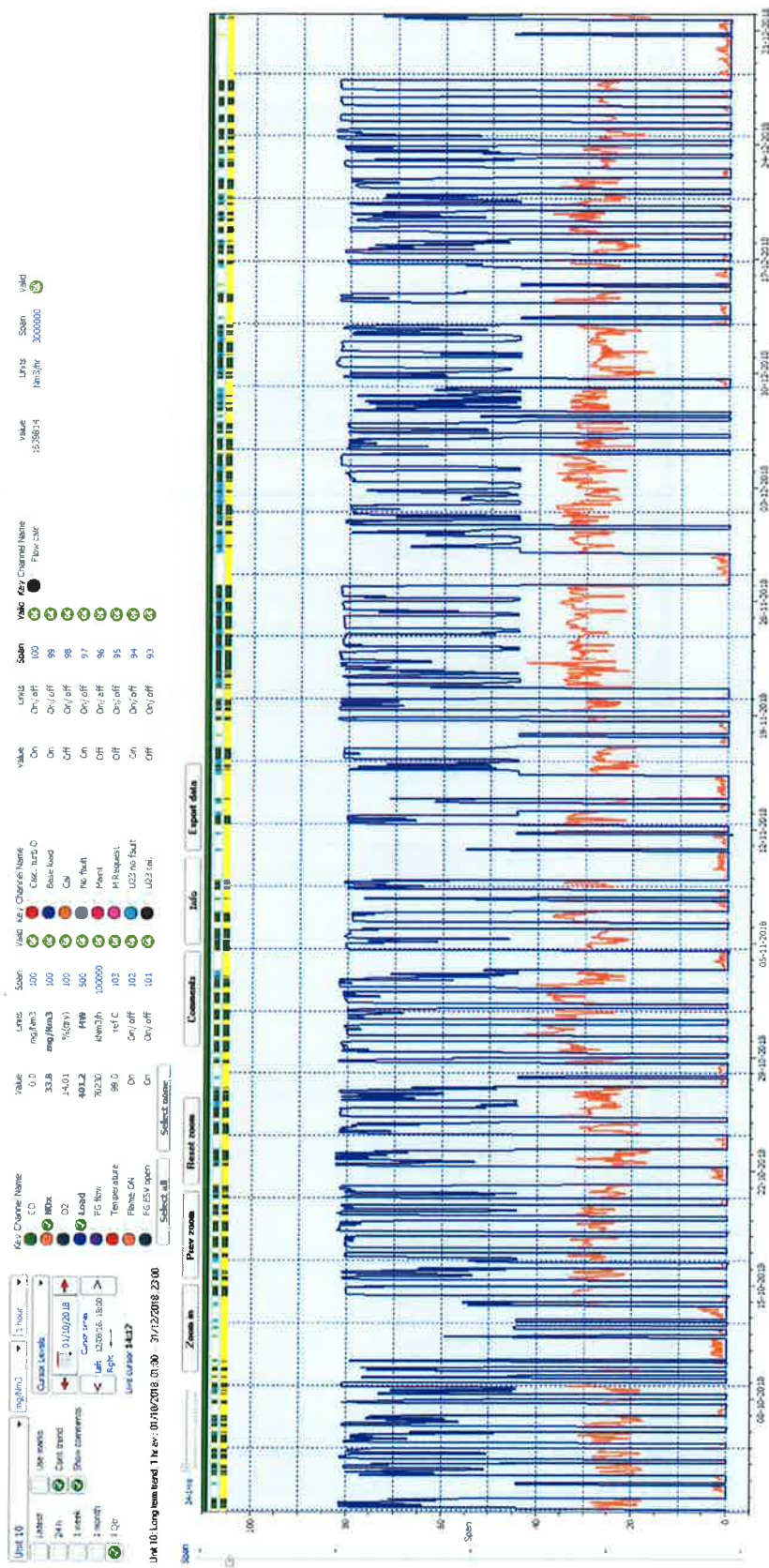
15/07/2019, 14:05:26 System: S:\C++ Reports: 0% / 50.0k 1 0 2 40 USD Connected



15/07/2019, 14:00:51 | System Secure | Synology Drive | Reports | CPU Status | User Connected



15/01/2019, 14:10:46 System Secure Print users Reports Sys Diag Help Support Reports DSL Status DSL Connected



Quarterly Trends CEMS Graphs for Unit 20 (LCP 235) 2018

15/01/2019 14:12:16 System Secure

Unit 20
 mg/m³ 1 hour
 Latest
 24h
 1 week
 1 month
 1 Qtr

Use news
 Cont trend
 Show comments

Cursor Levels
 0.00/20.0
 0.00/20.0
 0.00/20.0

Live cursor 2247
 Left: 0.00/20.0
 Right: 0.00/20.0

Key Channel Name
 CO
 MDK
 O2
 Load
 FG flow
 Temperature
 Flame ON
 FG ESV open

Value
 0.0
 0.3
 20.77
 -46.5
 150
 32.6
 Off
 Off

Units
 eq/m³
 mg/m³
 % (v/v)
 °F
 km³/h
 °F C
 On/off
 On/off

Valid
 100
 100
 25
 500
 100000
 100
 103
 102

Key Channel Name
 Calc. turn O
 Base load
 Cal
 No fault
 Alert
 M Request
 U23 no fault
 U23 cal

Value
 Off
 Off
 On
 Off
 Off
 On
 Off

Units
 On/off
 On/off
 On/off
 On/off
 On/off
 On/off
 On/off

Valid
 101
 100
 99
 98
 97
 96
 95
 94

Key Channel Name
 Flow calc

Value
 3502

Units
 Nm³/h

Valid
 1000000

Export data

Comments

Info

Prev zoom

Reset zoom

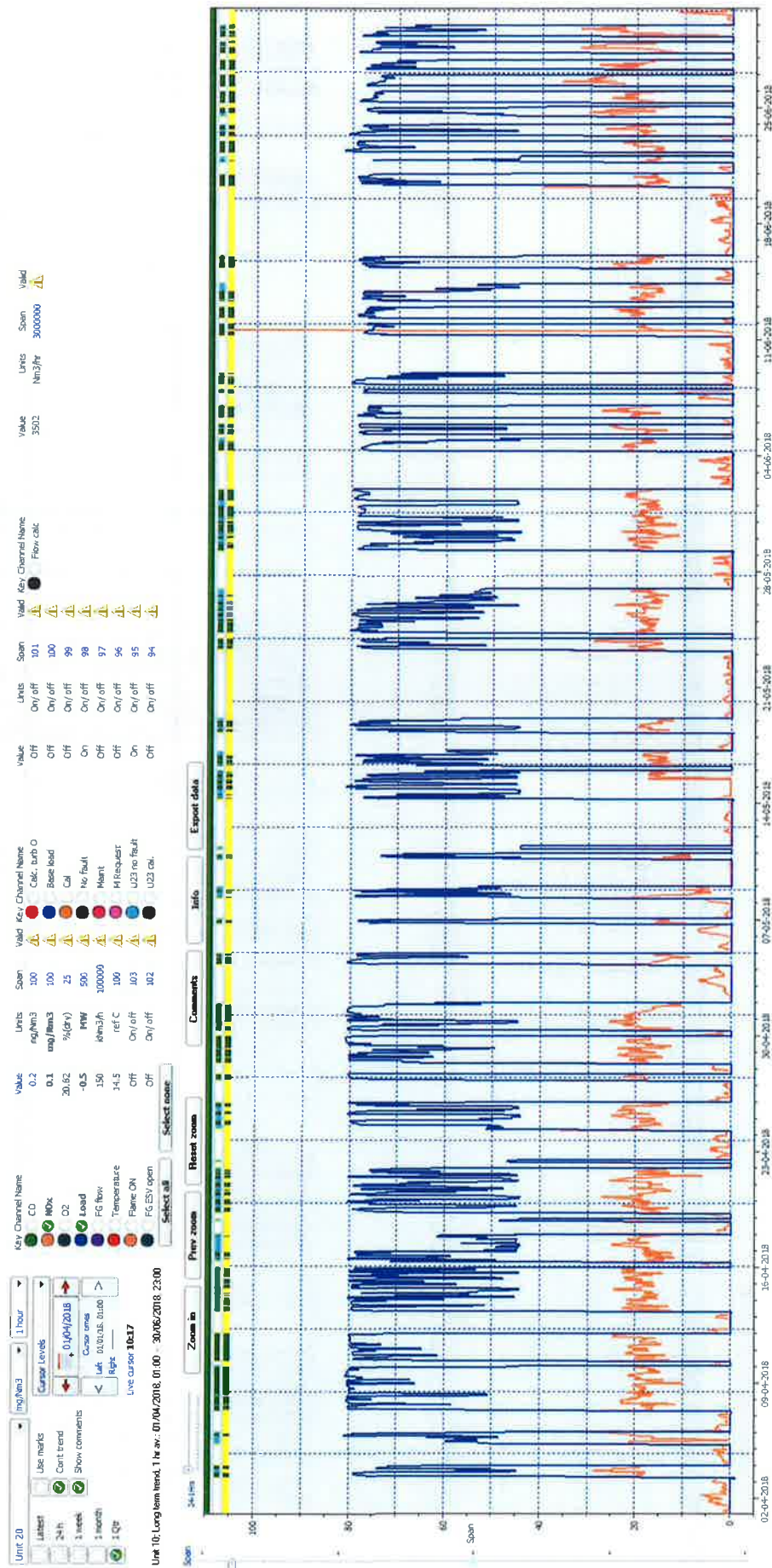
Zoom in

Zoom out

34 hrs

Unit 20 Long term trend, 1 hr av. 01/01/2018, 01:00 - 31/02/2018, 23:00

DSU Connected | DSU Status | 2 |



Unit 20 Quarter 3 of 2018

15/01/2018 14:15:29

System Setup

Show alarms

Print screen

Save screen

Sys log

Help

Reports

DSM status

1

2

3

DSM Connected

Unit 20

Unit 20

Latest

24h

1 week

1 month

1 yr

Use marks

Cont trend

Show comments

mg/m3

1 hour

0.0

20.77

-0.6

150

27.0

Off

Off

CO

NOx

O2

Load

FG flow

Temperature

Flame On

FG ESN open

Key Channel Name

CO

NOx

O2

Load

FG flow

Temperature

Flame On

FG ESN open

Value

0.0

20.77

-0.6

150

27.0

Off

Off

Unit

mg/m3

mg/m3

%vol

kg/h

ref C

On/Off

Valid

On

On

On

On

On

On

Key Channel Name

Calc. Unit O

Base load

Cal

No fault

Plant

M Request

U22 no fault

U23 cal

Value

Off

Off

On

Off

On

Off

Units

On/Off

On/Off

On/Off

On/Off

On/Off

On/Off

Scan

101

100

99

98

97

96

95

94

Valid

On

On

On

On

On

On

Key Channel Name

Flow calc

Value

3502

Units

Nm3/hr

Scan

3000000

Valid

On

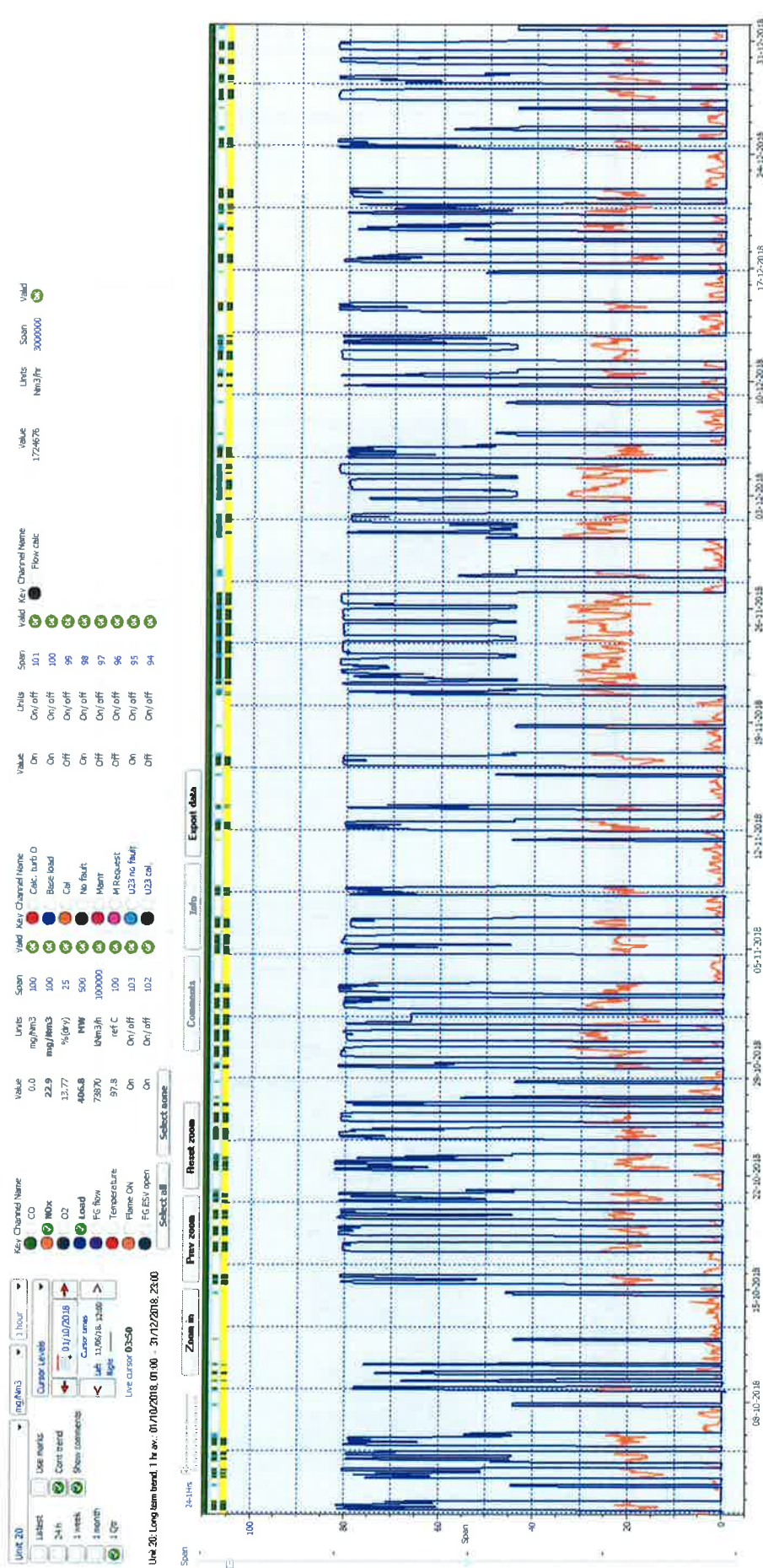
Unit 20: Long term trend, 1 yr av. 01/07/2018, 01:00 - 30/09/2018, 23:00

Unit 20

Long term trend, 1 yr av. 01/07/2018, 01:00 - 30/09/2018, 23:00

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15/01/2013, 14:16:30 System Security Show alarm Print screen Help Save settings Reports DSO Statistics 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000 1001 1002 1003 1004 1005 1006 1007 1008 1009 1010 1011 1012 1013 1014 1015 1016 1017 1018 1019 1020 1021 1022 1023 1024 1025 1026 1027 102



Appendix 3

June 11th Peak Reading due to Autocalibration Event



Appendix 4 CEMS Maintenance – Examples of Proactive and Reactive Maintenance

Example of Proactive Maintenance

Fault Notification PROD

Find Table **Fault Notification**

FN No. 645 2018 Status 8 Tech Closed H Priority 10 Within 6 months Site SEV
Rep. by WESTLEY JONES Sub status Work completed Recognition date 04/12/2018 Time 14:50
Section IC Tel. Req. no. End date 06/12/2018 Time 08:20

Plant identification
Pl. item >> 20CFE01GH001 Descr. CEMS Equipm. 10978
Class CAB/MOD (I&C) Loc. 1 20UHA0175 Instal. Check open FNs

Fault Whilst carrying out annual, found chiller unit faulty (Not cooling)

Measures Replaced with spare unit from store S112920-defective unit to be sent away for repair to OEM
WO 1797

Repair note [COMPLETE, FN645 RAISED FOR CHILLER REPLACEMENT], non-stock added to WO 1797 for defective unit repair off-site at CEM -->

Scheduled date ☐ Doc. ☒ Report Responsible for repair Open Pt 0 / 0
Relevant for FN without WO

Start End Section IC Tel. Assigned to Work order WO No. 1797 2018 Status 8 Complete Item

Recognition characteristics
Plant Oper. status Operation base load Influence on plant availability None
Occasion Noted on local inspection Notific. type Defect

Root cause
Fault Type EOF Equipment Failure
Root cause OTHR Others

Prepared By
Prep. by WESTLEY JONES
Section IC Date 04/12/2018

FN Risk Assessment Matrix
Rating L Risk score 0 Consequence priority 1

Remarks

Overdue FN reason
Reference data

Claims
Scope O&M
Claim Status No Claim

☐ Mandatory report
☐ Operation restrictions
☐ O&M doc update required
☐ Shift log
☐ Parts replaced

Example of Reactive Maintenance

Fault Notification PROD

Find Table **Fault Notification**

FN No. 255 2018 Status 6 Tech Closed H Priority 03 Within 1 Week Site SEV
Rep. by DARREN WAGG Sub status Work completed Recognition date 15/05/2018 Time 13:43
Section IC Tel. Req. no. End date 16/05/2018 Time 10:23

Plant identification
Pl. item >> 20CFE01GH001 Descr. CEMS Equipm. 10978
Class CAB/MOD (I&C) Loc. 1 20UHA0175 Instal. Check open FNs

Fault CEMS - Both NO and CO reading zero or less.

Measures Peristaltic pump failed.
Replaced under WO 784 - readings now ok <DW 15/5/18>

Repair note Replaced under WO 784 SI 13068 - readings now ok <DW 15/5/18> [pump replaced <DW 15/5/18>] -->

☒ Doc. ☒ Report Responsible for repair Open Pt 0 / 0
Relevant for FN without WO

Start End Section IC Tel. Assigned to Work order WO No. 784 2018 Status 9 Closed out Item

Recognition characteristics
Plant Oper. status Not applicable Influence on plant availability None
Occasion Noted on local inspection Notific. type Defect

Root cause
Fault Type EOF Equipment Failure
Root cause CORR Corrosion/Erosion

Prepared By
Prep. by DARREN WAGG
Section IC Date 15/05/2018

Overdue FN reason
Reference data

Claims
Scope O&M
Claim Status No Claim

☐ Mandatory report
☐ Operation restrictions
☐ O&M doc update required
☐ Shift log
☐ Parts replaced

