Cooling Outage in CDCE on 6/29/21

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U.S. DEPARTMENT OF ENERGY

Overview

- Tuesday 6/29/2021, starting around 10:15am another major cooling failure occurred due to issues with the chilled water piping clog feeding CDCE room 515 SDCC.

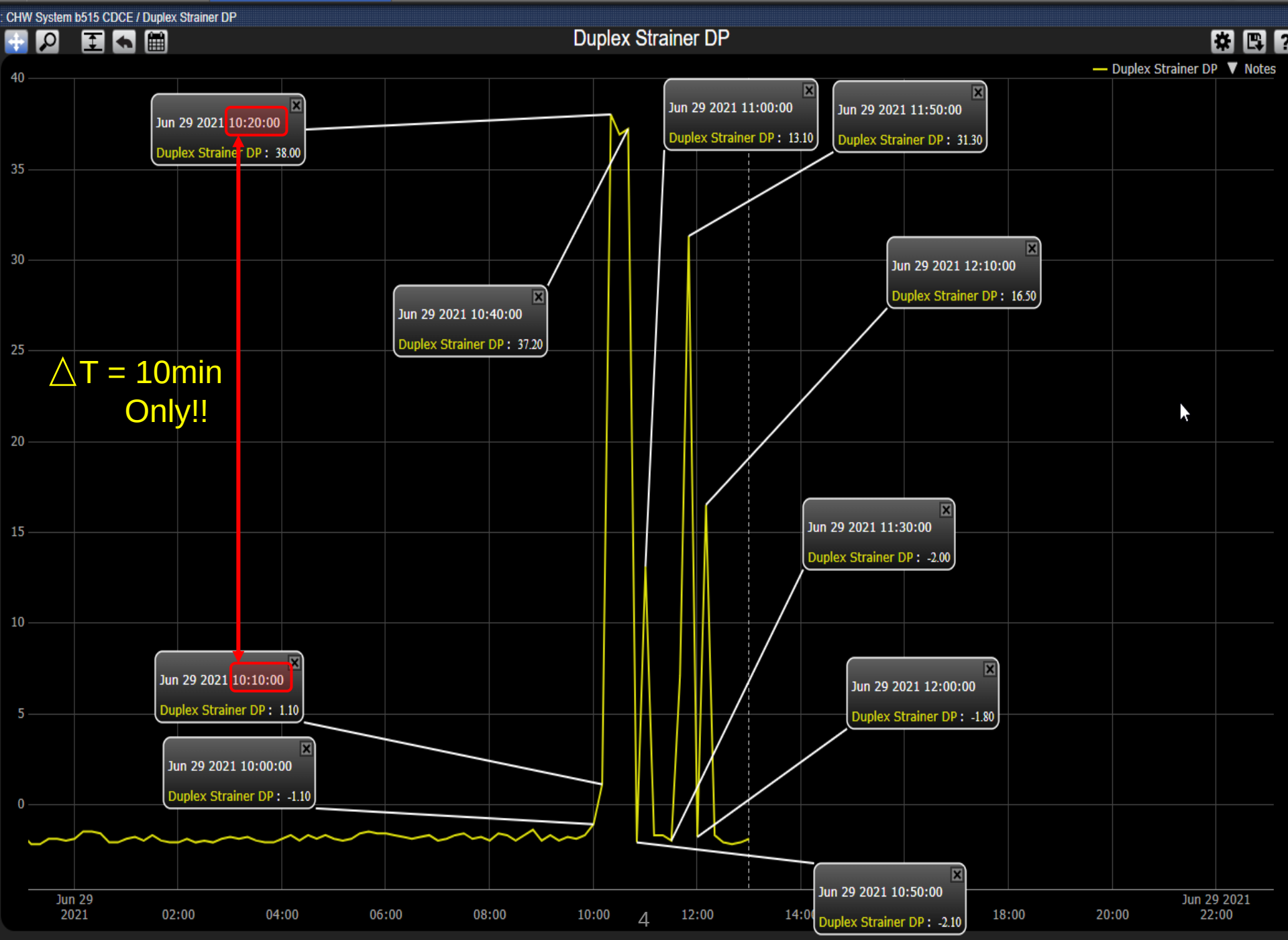
- The space temperature in CDCE room rose up, triggering the automated monitoring software shutdown scientific equipment to prevent it from getting damaged.

- A RHEV hypervisor shutdown along with 40+ Virtual Machines and were automatically restarted on another hypervisor.

- The cooling issue was repaired by approximately 12:30 PM, and the farm equipment was powered back online, and opened to jobs after CDCE room temperature stabilized.

Cooling Issue

- The primary strainer basket in duplex chilled water strainer system in CDCE got clogged instantly despite getting cleaned frequently.
- This resulted in loss of chilled water flow to Computer Room Air Handling (CRAH) units in CDCE subsequently the space temp in CDCE rose and forced the automated power shutdown on compute nodes
- Data Center Ops team, contacted F&O as the dp reached 2 psi. The F&O AC tech responded within 15 min.
- The mineral deposit in the chilled water stream deposited on the inner strainer mesh within 10 min resulting in no chilled supply to the cooling units in CDCE.
- The strainer baskets with finer mesh were cleaned multiple times but the issue persisted.


CHW System b515 CDCE / Duplex Strainer DP
Duplex Strainer DP
Duplex Strainer DP
Notes
Jun 29 2021 10:20:00
Duplex Strainer DP : 38.00
Jun 29 2021 11:00:00
Duplex Strainer DP : 13.10
Jun 29 2021 11:50:00
Duplex Strainer DP : 31.30
Jun 29 2021 10:40:00
Duplex Strainer DP : 37.20
Jun 29 2021 12:10:00
Duplex Strainer DP : 16.50
△T = 10min
Only!!
Jun 29 2021 11:30:00
Duplex Strainer DP : -2.00
Jun 29 2021 10:10:00
Duplex Strainer DP : 1.10
Jun 29 2021 12:00:00
Duplex Strainer DP : -1.80
Jun 29 2021 10:00:00
Duplex Strainer DP : -1.10
Jun 29 2021 10:50:00
Duplex Strainer DP : -2.10
40
35
30
25
20
15
10
5
0
Jun 29 2021
02:00
04:00
06:00
08:00
10:00
12:00
14:00
18:00
20:00
Jun 29 2021 22:00

Corrective Actions

- While the finer mesh strainer was getting clogged after cleaned again, the executive decision was taken and the primary strainer basket was replaced with the coarser strainer mesh to allow finer mineral sediments to pass through the system instead of getting deposited on the inner basket surface and blocking the chilled water flow to the cooling units in CDCE.

- The AC techs were deployed during the day on 6/29 and three CRAH units were repaired to boost up cooling reliability in CDCE room

- Two AC techs were scheduled on OT on 6/29 coupled with the site shift team and following work was done till 8am on 6/30,
  - Cleaning of branch chilled water strainer in individual CRAH units
  - Cleaning of the duplex strainer system feeding CDCE

- Same actions were taken on 6/30

- The cooling issue has been resolved and the chilled water flow and pressure and normal in in steady state.

Corrective Actions

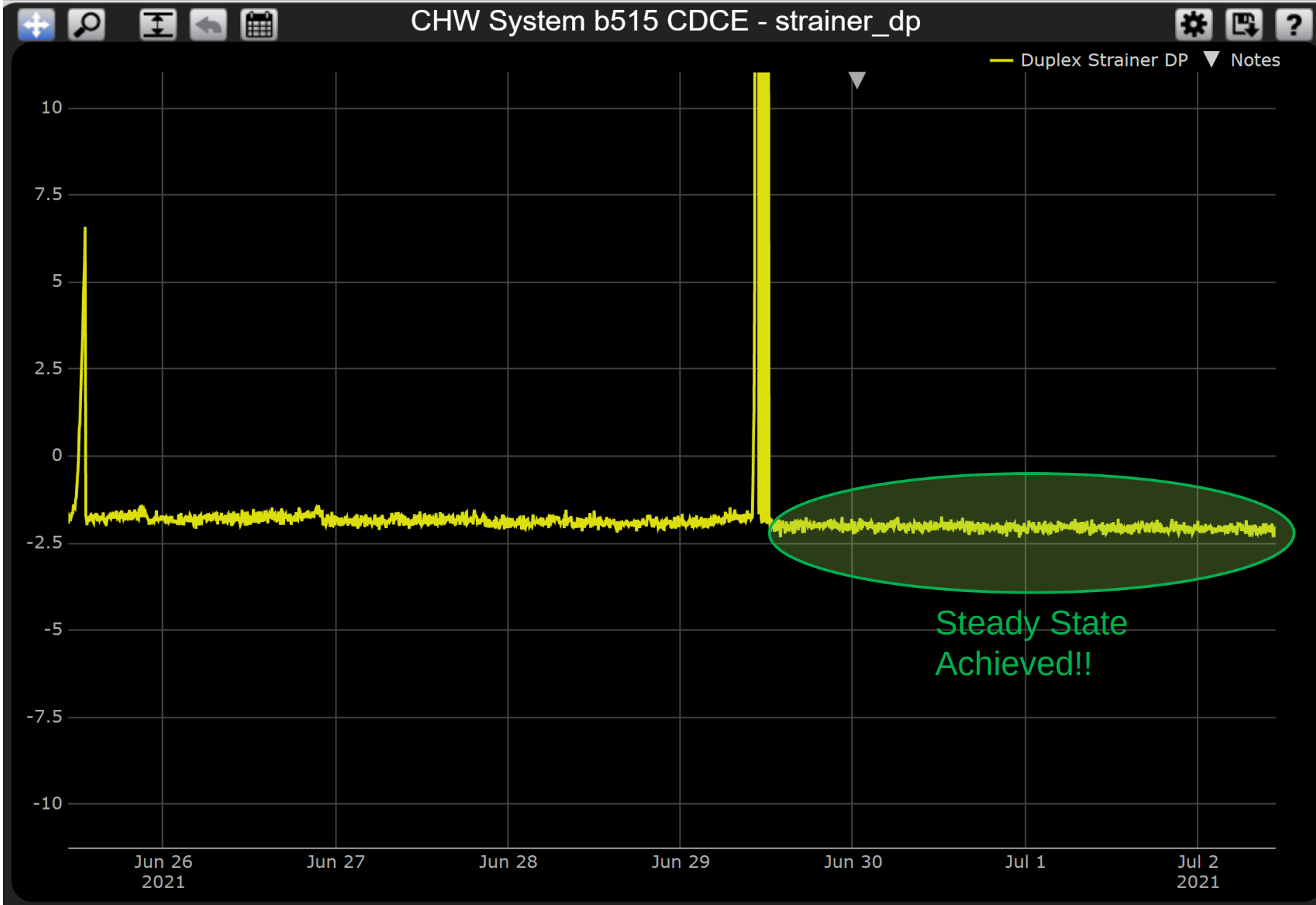
- The sediments samples collected are being evaluated by BNL's geologist to know its composition
- The DP critical response alarm set has been reduced to 2psi through programming in building automation system
- BNL's AC shop and site shift will continue to monitor and periodically clean the coarser strainer
- The bottom chilled water piping tap feeding CDCE is still on course to be replaced by the side tap. The work will be performed in fall after approval from SDCC
- All corrective work performed will not be charged to SDCC

Sediments Collected n fine mesh strainer (now being secondary in the system)

Sediments Collected in coarser strainer (now being primary in the system)

Trend Graph - BNL / Building 515 / CDCE (Computer Data Center Extension, Room 1-4K) / CHW System b515 CDCE - Google Chrome

emcs.bnl.gov/_trendgraph/index.jsp?loc=%23bnl515_chw_system%2F~reports%2Fstrainer_dp&bgcolor=%23D5D5D5&width=100%25&hei...




Questions
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