

Comments on Upstream LCW Review

Responses by Bruce Baller

May 7, 2004

Review is based on MI-62 LCW System Engineering Note

1. (Reviewer: M. Ball) There have been significant changes to the interlock, alarm, and monitoring description for this system over the past several weeks. As a review of what was previously agreed between Dave Pushka, Bob Ducar, and myself, the following changes and/or additions should be addressed as revisions to the Interlock and Control Sections of the MI-62 LCW Systems (upstream)
Engineering Note:
 - a. Loss of PLC "Heartbeat" for 15 minutes
 - b. LCW pump suction pressure below 15 psi for 1 minute
 - c. Pump Motor Phase C current below pre-set value for 10 seconds
 - d. Pump Motor Phase C current above pre-set value for 10 seconds
 - e. Any modifications of the PLC interface to the motor controllers and LCW/Pond Pumps

OK

2. (Reviewer: M. Ball) Is motor and pump specification and performance information available for the MI-62 Pond Pumps? If so, please include in engineering review note.

Done

3. (Reviewer: M. Ball) Is a differential pressure indicator across the Pond Strainer and the DI bottles really necessary? The PLC could monitor simple inlet and outlet analog pressure sensors and alarm at a pre-set differential within the PLC. This eliminates one additional external switch that could fail. This is only a recommendation.

OK

4. (Reviewer: M. Ball) Pressure sensors and gauges that measure on the suction or return side of the MI-62 LCW system should be purchased with a smaller operational range than on the discharge or supply side. I noticed losses in accuracy and repeatability on the low end of the measurable range in Main Injector LCW applications. This low end is where most return and suction pressure readings will be measured. I recommend a range equal to twice the suction or return operation pressure.

OK

5. (Reviewer: R. Schmitt) The supply piping with defective welds is a concern regarding future leaks. There may be a risk of leaks due to crevice corrosion. Have violations of ES&H chapter 5031.1 been justified technically?

Yes

6. (Reviewer: R. Schmitt) Besides radiography, will the installed piping be checked for the correct location and type of supports with respect to the thermal expansion analysis?

Yes

7. (Reviewer: R. Schmitt) The Instrument list should be completed with make, model number, range, output signal, etc. It is assumed that the instruments will be named later.

OK

8. (Reviewer: R. Schmitt) A lead/lag auto start arrangement is recommended for the pumps. If even one shutdown due to pump failure is avoided it would be worthwhile.

Done

9. (Reviewer: R. Schmitt) Move the 3-way temperature control valve process variable to the TE just left of the valve. It will provide a faster response in case of load changes.

OK

10. (Reviewer: R. Schmitt) Air removal would be easier if an air separator was installed in a main circulation line. The high point vents shown on the piping layouts are not shown on the P&ID.

OK

11. (Reviewer: R. Schmitt) Add pressure indicators at the extreme ends of the magnet and service building headers. They may be helpful with diagnostics.

OK

12. (Reviewer: R. Schmitt) Unless there is abundant excess flow, add flow indicators or temperature indicators to each magnet or heat exchanger. If balancing is necessary there is no apparent means to tell where the water is going now. Do these magnets have flow or temperature interlocks?

Temporary flow meters may be installed if balancing is required. Klixons are installed on all water-cooled magnets.

13. (Reviewer: R. Schmitt) A total system flow meter on the LCW will allow total heat load to be determined. Not necessary if the system is oversized.

OK

14. (Reviewer: R. Schmitt) A flow meter on the pond pumps will help show plugging at the pump inlet and general pump performance.

OK

15. (Reviewer: R. Schmitt) The purpose of the regulator PCV-1 is unclear. Should this be a backpressure regulator? It looks too small to regulate the system pressure.

16. (Reviewer: R. Schmitt) Sending only one percent of the flow through a de-ionizer may result in a long clean up time. Are the conductivity requirements known?

Yes.

17. (Reviewer: R. Schmitt) Can the nitrogen from the expansion tank vent indoors? Has the ODH been considered?

There is no ODH consideration.

18. (Reviewer: R. Schmitt) The pond pumps should be equipped with check valves. They may be already, but the drawing is unclear.

OK

19. (Reviewer: R. Schmitt) The pond pumps should be equipped with individual suction block valves, so that one can be replaced while the other is running.

OK