Addendum

BUUSD Facilities Cmt Meeting

May 18, 2026

May 8, 2026

Mr. Jamie Evans
Facilities Director
Barre Unified Union School District
120 Ayers Street
Barre, VT 05641

Dear Jamie,

The existing Spaulding High School oil boiler system has two oil boilers that are over 60 and 40 years old, one being original to the building, and are well past ASHRAE life expectancy. While these boilers are still operational and are still providing useful service, they are in need of replacement and becoming closer to a catastrophic failure.

The existing high mass cast-iron boilers are subjected to thermal shock during startup and high temperature fluctuations. The existing system control has been maintained well and seems to operate as required through a three-way mixing valve, although the three-way mixing valve is at end of life and has shown some leakage.

The oil boilers have well exceeded their life expectancy of approximately 30+ years for commercial cast iron boilers . Both boilers have been well maintained through the years but are showing signs of extreme fatigue and inefficiencies. The 1964 boiler is of an age where parts aren't available for replacement and mechanical contractors have limited resources with servicing the boilers. The 1983 boiler is in a state of failure, as the interior fire tubes are leaking water and will require a major repair. The boilers need replacement prior to complete failure.

We are proposing using low mass flex tube boilers that are not affected by thermal shock and manage low return water temperatures better during startup and high load demands. This advantage enables the boilers to perform on better operational range for outside air temperature reset. Additionally, the new boilers eliminate the need for additional controls and costly components to deal with thermal shock.

The new boiler system can also be controlled to tighter control sequences while not having to over fire the boiler to prevent thermal shock. This eliminates thermal shock and over firing concerns providing energy and cost savings.

There are several advantages for using new low mass boilers over maintaining the existing boilers:

1. Eliminates the critical requirement for finding outdated boiler components during failures to maintain the old boilers.
2. Thermal shock concerns are eliminated simplify installation.
3. The thermal mass is significantly lower which enables the boilers to heat up faster.

4. Less energy is needed to heat the boiler up to temperature due to a lower mass.
5. Less energy is lost after the boilers are sitting idle. The high mass boilers lose more energy up through the flue during idle times.
6. New boilers blend well to outside air temperature rest. This provides more opportunities for better control sequencing and energy savings.
7. The new boilers have a smaller footprint and occupy less space. This provides better service area around the boilers and frees up space for other equipment in the boiler room.
8. The proposed low mass boiler has less water jacket gasketing compared to the old sectional boiler and has a lower potential for leaking and gasket failure.
9. The low mass boilers respond faster, switching from high to low system load demands.
10. The new boiler uses newer control devices and components that will be easier to obtain compared to the older boiler.

In conclusion, the continued operation of the existing boiler plant presents an escalating risk of mechanical failure and inefficient energy consumption. Transitioning to a modern, high-efficiency system will not only stabilize your facility's heating reliability but also deliver significant reductions in annual fuel expenditures and carbon emissions. By prioritizing this replacement now, you can avoid the higher costs associated with emergency repairs or unplanned downtime. I strongly recommend proceeding with the replacement to ensure the long-term resilience and fiscal health of your infrastructure.

Warm regards,

James Harrington

James Harrington, PE
Director of Engineering