

A decorative vertical bar on the left side of the slide, composed of several horizontal segments in various shades of blue, teal, and yellow, set against a black background.

Cooling Water Supply for Beamline Components



Goals

- Improve system reliability
- Reduce cost of operation and of future beamline construction
- Minimize maintenance
- Provide enhanced engineering and technical support to Users
- Maintain reliability of APS process water system

Present System



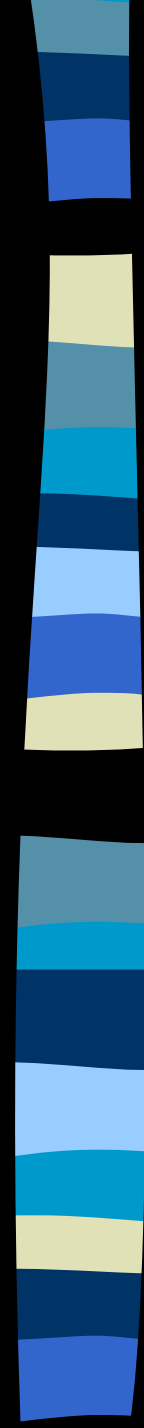
May 20, 1994

APS TECHNICAL UPDATE - No. 3

Subject: Deionized water supply not available for beamline use

The APS facility deionized water supply provides the cooling for the entire accelerator system. In order to ensure the integrity of this supply, it will not be provided for cooling beamline components. (It had previously been indicated that a limited quantity would available for beamline use.)

Chilled water is supplied to the Experiment Hall for beamline use, refer to *APS Sector Layout Utilities, etc., ANL/APS/TB-9* for the specifications of this supply. When a deionized water cooling system is required for beamline components, a CAT may install a proprietary closed loop system which can reject heat to the chilled water through a heat exchanger.









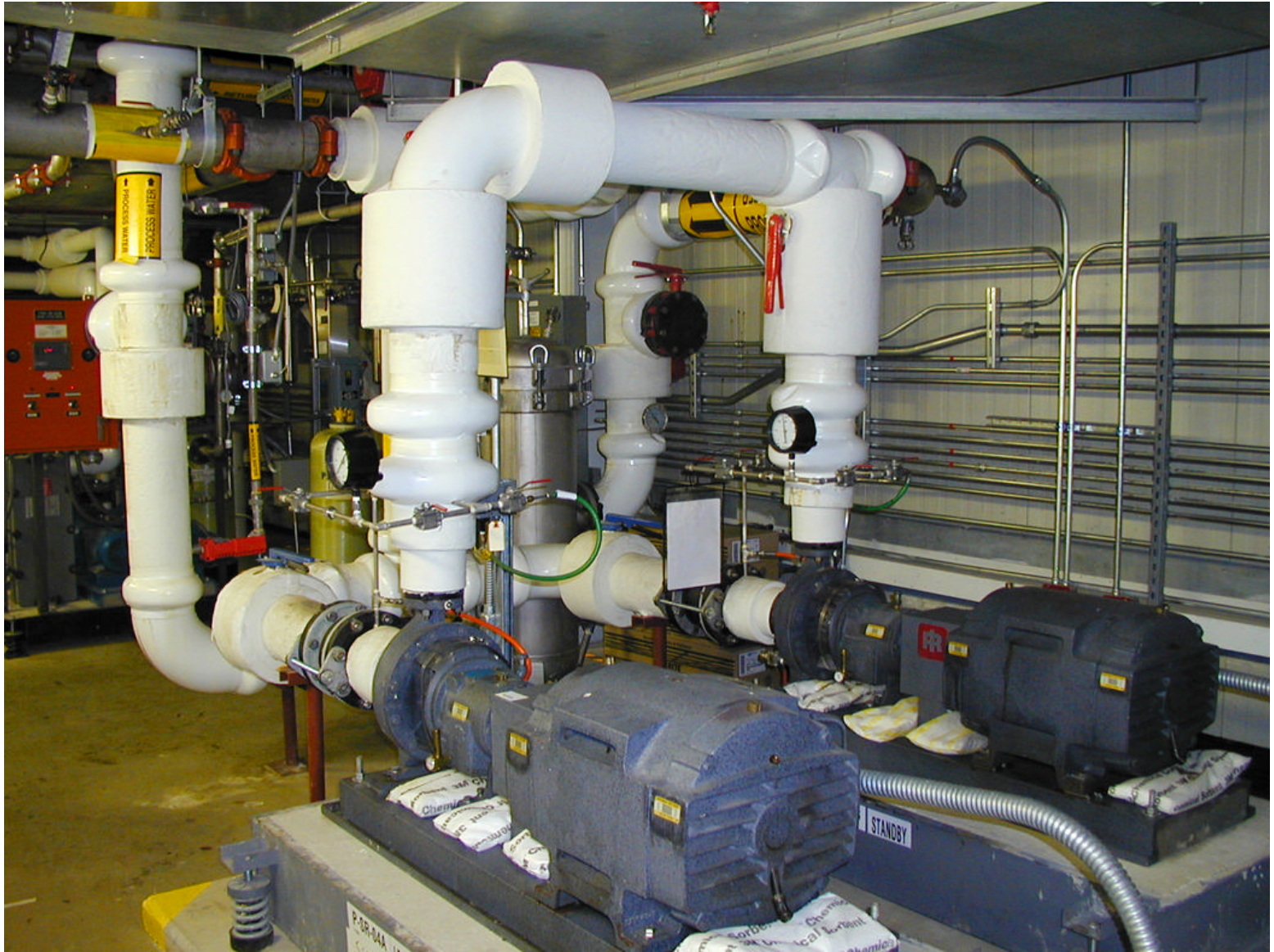
PROPOSAL



Utilize APS process (DI)
water systems

Benefits for CATs

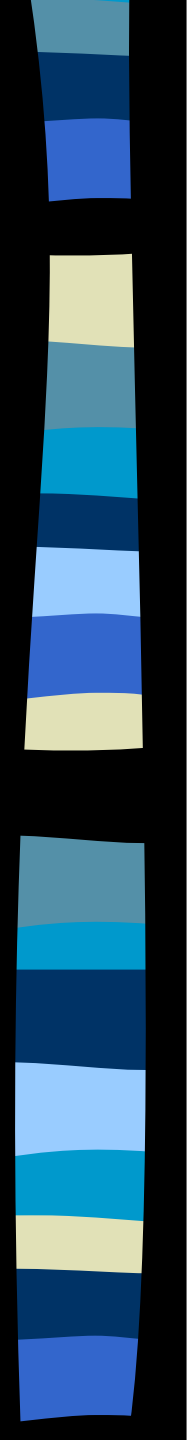
- Benefit from system improvements made to APS water systems.
- Operational and maintenance expertise.
- System reliability equal to that of the accelerator water system (>99.5%).
- High quality water supply.
- Eliminate maintenance of pumps, filters, nitrogen, polishing, controls which are currently part of skids.
- Automatic water make-up.
- Noise and vibration reduction.





ASD process water system parameters

- Supply pressure 135-150 psig
- Return pressure 30-40 psig
- Supply temperature 78 +/- 0.2 deg F
- Resistivity 7 Megaohm x cm
- Filtration 0.5 micron
- Dissolved oxygen <10 ppb
- Bacterial control with UV lights
 - *Note: Each of 20 secondary water systems can provide up to 50 gpm (25 gpm per sector) of closed loop water for beamline use*
 - *Other use to be considered individually*



System improvements implemented since original installation.

- Improved polishing, degasification and make-up systems.
- Standby process water/chilled water heat exchanger installed.
- All secondary pumps have been rebuilt with new bearings, new seals, and sight glass.
- Laser pump/motor alignment implemented.



System Improvements (cont.)

- New oil selected to increase running time between changes.
- New, finer filters installed.
- Uninterruptible flow switchover implemented for standby pumps.
- High pressure cutout switches installed.
- Vibration monitoring system implemented.
- Temperature control improved.



Considerations / Concerns

- **System modifications and operation shall not jeopardize reliability and operation of APS**
 - Administrative controls will assure system stability that may be compromised by pressure fluctuations, contamination, air pockets as a result of
 - ✓ Excessive leaks
 - ✓ Closing and opening of valves
 - ✓ Draining
 - ✓ Fill
 - ✓ Contaminated Equipment



Administrative Controls

- ASD-ME will work with each CAT to determine water requirements and installation options for system optimization.
- All equipment immediately prior to connection to APS water system will be flushed with APS process water.
- ASD-ME will coordinate and complete all water system operation including taking equipment on and off line, draining, fill, new piping installation, existing piping modifications etc.
 - **Note: ASD water group technicians are available on two-shift operation and on weekends.**



Proven Implementation

- Sector 35 connected to APS secondary water system
 - *Note: If requirements are different than what current systems are capable of supplying different design options will be offered*

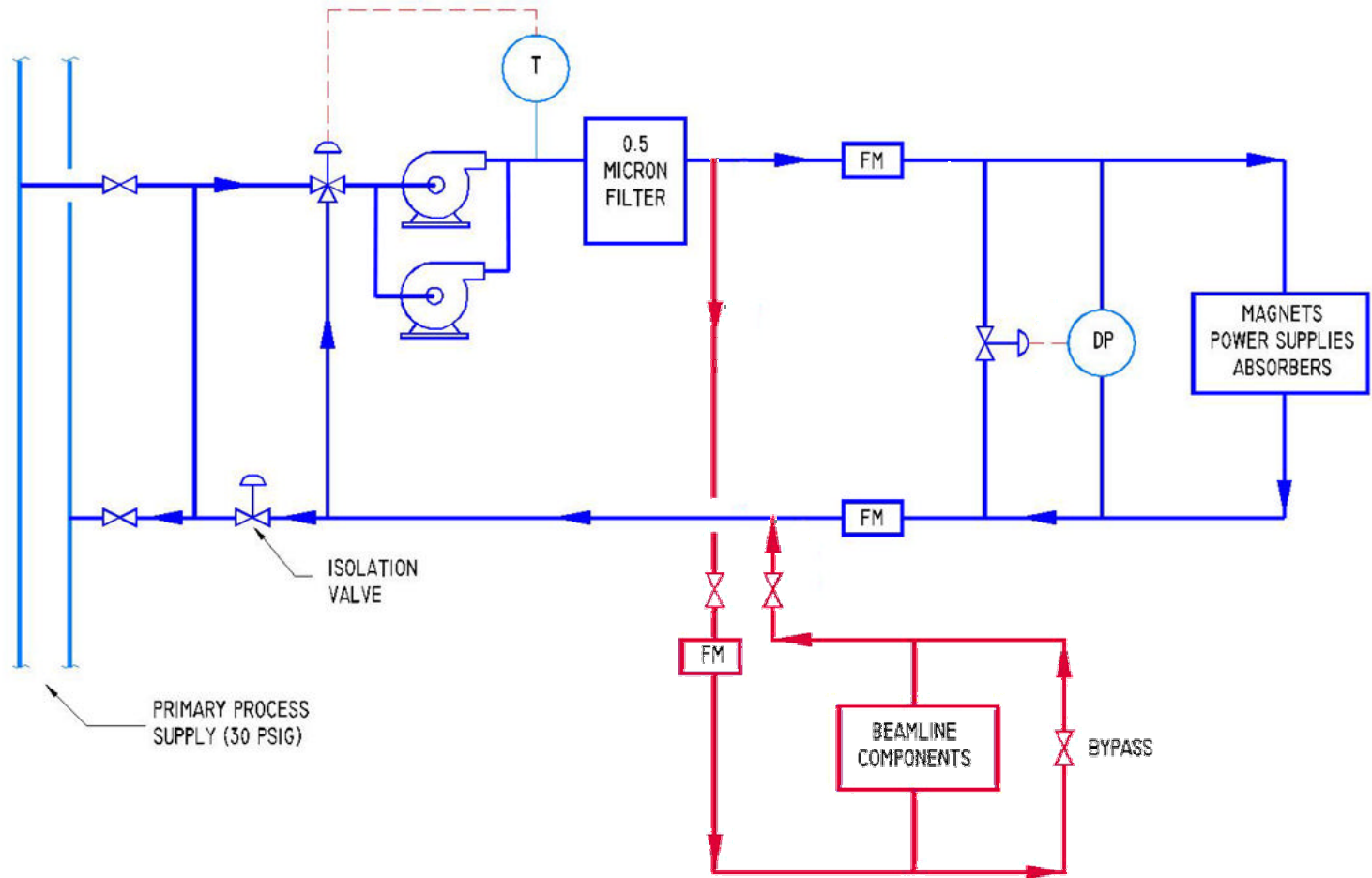


TO SECTOR 35

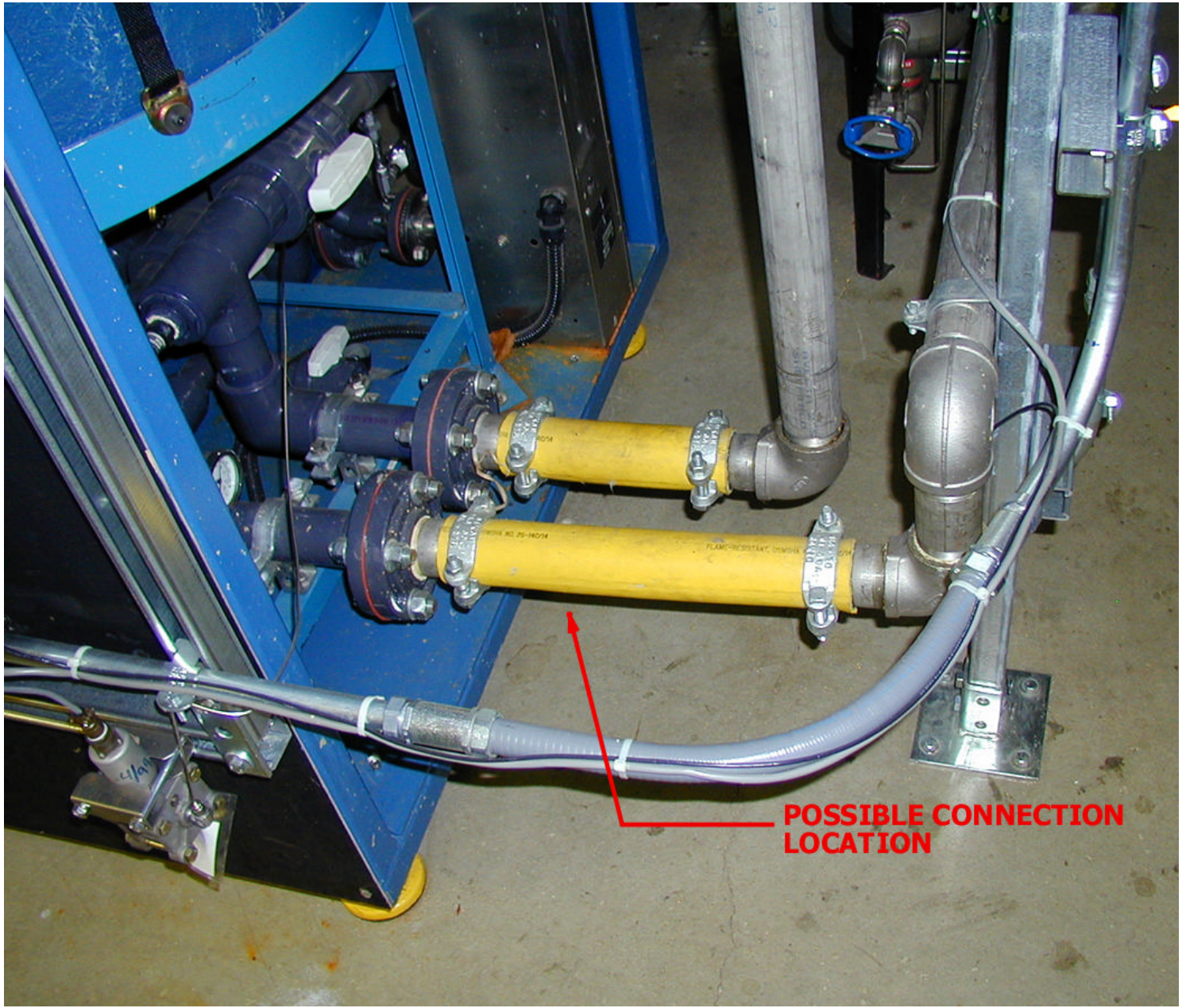
TO POWER SUPPLIES

Connection of Beamline Components To Secondary Water

Sy







**POSSIBLE CONNECTION
LOCATION**

