

WATER SYSTEM RESPONSIBILITIES (Bob Dortwegt)

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Advanced
Photon
Source

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SUMMARY OF SYSTEMS

LINAC WATER SYSTEMS

S.R. BAKEOUT SYSTEMS

(hot water conditioning)

FRONT ENDS & BEAMLINES

(User water distribution & controls)

CRYOGENIC SYSTEMS FOR
USERS

(maintenance)

PAR VACUUM CHAMBERS

(spares)

WATER QUALITY

(R&D)

SAFETY COMMITTEES

LINAC WATER SYSTEMS

❖ CLOSED LOOP STATIONS FOR ACC. STRUCTURES

- ❖ Four stations
- ❖ Regulation to $\pm 0.1F$
- ❖ Proving ground for developing in-house knowledge of Allen-Bradley PLC systems
- ❖ Real need for flow trending capability



LINAC WATER SYSTEMS (Continued)

- KLYSTRON AND POWER SUPPLY FLOW METERING
 - Upgraded flow monitoring in place
 - Typical of reliable systems built in-house
 - No moving parts
 - Highly reliable electronics
 - Professional quality



STORAGE RING BAKEOUT SYSTEMS

- ✓ Used during aluminum vacuum chamber conditioning
- ✓ Twenty systems around Storage Ring
- ✓ Installed in SR Utility Aisle
- ✓ Relatively complicated process
 - ✓ Temporary equipment to isolate chambers from cooling system
 - ✓ Heat recovery exchanger to purge DI water continuously
 - ✓ Operating pressure >100psig at 150C (safety concern)



FRONT END & BEAMLINER SYSTEMS

- Front end EPS System (equipment protection)
- Beamline PSS System (personnel protection)
- Upgrade in progress
 - Similar reliability of other systems desired
 - Beamline PSS transmitters only (not front ends)
 - Replace Viatran with Yokagawa
 - New transmitters installed exterior to hutch (photo)
 - 3 beamlines completed in January (impact on beamline operation already noticeable)



CRYOGENIC SYSTEMS FOR USERS

- ❖ LN2 used to cool monochromators in beamlines
- ❖ Maintenance of User owned cryogenic equipment
 - ❖ Most work done during machine maintenance periods
- ❖ Spare parts inventory
- ❖ Significant service for Users



PAR VACUUM CHAMBERS

- ❑ An inventory of 16 chambers is maintained
- ❑ Five spare chambers currently being designed/fabricated



WATER QUALITY R & D

- ❖ Copper corrosion in DI water at manageable rates at APS
 - ❖ An issue at all accelerators
 - ❖ Under control since dissolved oxygen was reduced in 1998
 - ❖ Copper corrosion still occurring
- ❖ APS-ME is the recognized leader in the accelerator community on the subject of copper corrosion
- ❖ Learned from recognized specialists in the power industry
- ❖ Passing information along to other accelerator facilities people
 - ❖ MEDSI 2002 seminar on copper corrosion well attended
 - ❖ Invited speaker at PAC2003 (LCW Systems for Accelerators)
- ❖ A critical issue which deserves more attention
- ❖ pH control would be desirable
- ❖ Corrosion rates could be lowered another factor of 5-10

SAFETY COMMITTEES

- ❖ Member of ANL-E Pressure Technology and Safety Committee Since 1992
- ❖ Working on 3rd draft of lab-wide Pressure Safety Manual
- ❖ Member of ASD-ME Safety Committee
- ❖ In-house reviews of new installations