

## Water Treatment Plant

### Recommended Monitoring

Given: All equipment mentioned below is already connected to the Supervisory Control and Data Acquisition (SCADA) System

Rotating Equipment	Bearing Type	Typically Spared	Essential Machines	Balance of Plant Machines	Monitoring System		Recommended Sensors			Minimum Sensor / Transmitters			Vibration Switch
					Recommended Monitoring & Protection	Minimum Monitoring & Protection	XY Probes @ 45° from C/L w/ Proximity Transmitter	Vertical (V) and or Horizontal Velocity Transmitter	Thrust Probes w/ Proximity Transmitter	XY Probes @ 45° from C/L with Transmitter	Vertical (V) and or Horizontal Velocity Transmitter	Thrust Probes w/ Transmitter	For minimum Protection (Electrical or Mechanical)
Intake Pumps	Rolling Element Bearings <sup>1</sup>	Y		Y	SCADA <sup>2</sup>	SCADA		Y			Y		SW5484E
Intake Pumps	Sleeve Bearing <sup>3</sup>	Y	Y		SCADA	SCADA	Y		Y	Y		Y	SW5580
Conveyor Belt Screens	Rolling Element Bearings	Y	Y		SCADA	SCADA		Y			Y		SW5484E
Low Pressure (LP) Lift Pumps	Rolling Element Bearings	Y		Y	SCADA	SCADA		Y			Y		SW5484E
Low Pressure (LP) Lift Pumps	Sleeve Bearing	Y	Y		SCADA	SCADA	Y		Y	Y		Y	SW5580
Coagulator / Fluoccculation Mixing Motors	Rolling Element Bearings	Y	Y		SCADA	SCADA		Y			Y		SW5484E
High Pressure (HP) Lift Pumps	Rolling Element Bearings	Y		Y	SCADA	SCADA		Y			Y		SW5484E
High Pressure (HP) Lift Pumps	Sleeve Bearing	Y	Y		SCADA	SCADA	Y		Y	Y		Y	SW5580

1. For Seismic Monitoring of Rolling Element Bearings, monitor the Rotor Related Region (1 / 4X to 3X) and the Prime Spike Region (1 to 6 times the Ball Pass Frequency Outer Race (BPFO))

2. Supervisory Control and Data Acquisition (SCADA) System

3. Sleeve Bearings are also known as Fluid Film Bearings and Journal Bearings are monitored with Proximity Probe Transducers (Drivers or Transmitters)

Sensor Type	At Each Bearing on Each Side of Coupling	Typically Spared	Essential Machines	Balance of Plant Machines	Vibration Sensors Connected to Monitors (SW5580 or other VMS)	Vibration Transmitters Connected to SCADA System	Minimum Protection Switches
Casing Vibration	Rolling Element Bearings	Y		Y	SA6200A Accelerometers on each side of the coupling.	ST5484E Velocity Transmitter on each side of coupling (Primary - Load Side)	SW5580, SW5484E, 440, SW6000. SM6100
Casing Vibration	Rolling Element Bearings	Y		Y	SA6200A Accelerometers on each side of the coupling.	ST5491 Indicating Velocity Transmitters on each side of coupling (Primary - Load Side).	SW5580, 440, SW6000. SM6100
Casing Vibration	Rolling Element Bearings	Y		Y	Walk Around Data Collection	Use permanent Velocity Transmitters for Difficult to Reach Locations	

For low speed machines (600 rpm or less) monitor both velocity and displacement with a SA6200A Accelerometer and a 5580 or SW5580 Monitor (Per Hydraulic Institute 9.6.4)

Sensor Type	At Each Bearing	Typically Spared	Essential Machines	Balance of Plant Machines	Transducers
XY Probes @ 45° from C/L w/ Transmitter	Sleeve - Radial Vibration	Y	Y		(2) MX8030 Proximity Probes, MX8031 Extension Cables, MX2034 Transmitters and Necessary Accessories
Thrust Probes w/ Transmitter	Thrust Collar	Y	Y		(1 or 2) MX8030 Proximity Probes, MX8031 Extension Cables, MX2034 Transmitters and Necessary Accessories
Casing Vibration	Sleeve - Radial Vibration	Y	Y		ST5484E Velocity Transmitter on each side of the coupling (Primary - Load Side)