



Instrument and control system leak risk management



Leak risks in process control systems

Water and wastewater treatment facilities rely on finely tuned process automation and control systems to maintain produced water quality to regulated parameters.

Instrument air leaks introduce risk in process control systems. If not detected in time, these leaks can result in control valve proportional positioner drift, reduction in available break-away torque from pneumatic valve actuators, and timing lag in control system feedback loops.

Over time these leaks will impact control system reliability, process efficiency, and can lead to unplanned plant shutdowns.

Instrument control systems therefore must remain at design pressure and volumetric capacity levels on order to maintain produced product quality and maximize plant uptime.

AIS (Asset Integrity Survey Services) specialize in process control instrumentation leak surveys on critical infrastructure assets across a range of industries. We have extensive experience surveying water and wastewater treatment facilities, upstream oil & gas production, and downstream processing facilities.

Our leak risk management (LRM) services are used by major clients including Santos, Incitec Pivot, QNP, Energy Australia, Oil Search, AMPOL, Gippsland Water, etc..



Minimise operations budget risks

Unscheduled plant shutdowns and unplanned maintenance generate operation budget pressures. Budgeted, planned and scheduled surveys always cost less than accumulated direct and indirect costs associated with unscheduled shutdowns and unplanned maintenance activities. Scheduled systematic leak detection surveys therefore reduce unplanned and non-budgeted maintenance and operations budget risks.



Scheduled, targeted, systematic leak surveys

Long range WIFI communication infrastructure enables reduction in plant operations manpower. Many process plants are operated from a centralized operations control room often located hundreds of kilometers away from the plant.

Distributed control system (DCS) error messages from these remote-controlled facilities are often caused by one or more accumulated leaks from the instrument air system resulting in control system pressure or volume losses.

Long distances and limited manpower mean plant operators have little or no time to perform scheduled, targeted, systematic leak surveys of their instrument air and control systems.

Asset Integrity Survey Services (AIS)

AIS have been delivering process leak risk management (LRM) surveys since 1999.

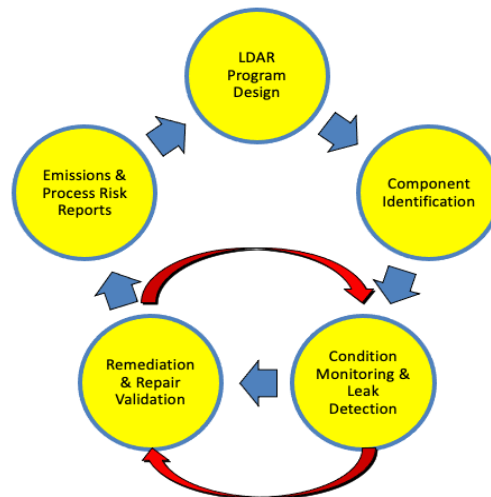
AIS leak risk management survey findings are integrated directly into our client's maintenance work order prioritization and scheduling system using leak classification and priorities based on asset class and asset type specific Risk And Priority Assessment (RAPA) parameters.

Our unique RAPA workflow results in context-based work order prioritization and timely remediation to reduce process integrity risk.

AIS personnel have relevant experience in valve and control system design and maintenance.

We survey all potential leak sources that can often be masked by background process noise, are out of reach, and undetectable using conventional techniques.

Our process control system knowledge, leak detection technology, and survey methods mean we quickly locate, quantify, document and report instrument control system leaks.



AIS Leak Detection And Risk Management Program

Leak Detection and Risk (LDAR) Management Program.

AIS Leak Detection and Repair (LDAR) and Leak Risk Management (LRM) programs cover 5 core elements;

1. Program design based on your process integrity objectives.
2. In-Scope process component identification using reality capture technology
3. Scheduled, thorough surveys of all potential leak sources.
4. Collaborative reporting software to contextualize, prioritize and schedule repairs.
5. Independent unbiased data that demonstrate compliance with corporate asset integrity management policies, procedures, or government regulations.

[Contact us for a confidential discussion on how we quantitatively reduce your leak risk and improve your process control system integrity.](#)



Examples of instrument air system leaks, root cause & remediation.

Asset	Leak Risk
	<ul style="list-style-type: none"> - Backwash system control valve positioner. - Delayed control response. - Position feedback control loop timing delay. - Quantified venting from the positioner bleed air vent as “above normal OEM Specification” . - Replaced torn / cracked positioner differential pressure diaphragm assembly.
	<ul style="list-style-type: none"> - Filter Outlet Valve Actuators. - Delayed opening. - Instrument air pressure drop reducing available break-away torque. - Leaks from instrument air isolation ball valve gland assemblies. - Replaced multiple ball valves with better specification / gland design.
	<ul style="list-style-type: none"> - Instrument air reservoir. - Not reaching & holding system design pressure. - Verified pressure relief valve is not passing to atmosphere. - Low but steady pressure drop traced to pin hole leaks from welded process piping connections. - API Pressure vessel inspection and repair activity added to planned shut-down maintenance work scope.



Examples of instrument air system leaks, root cause & remediation.

	<ul style="list-style-type: none"> - Sludge Discharge System. - Intermittent actuation of butterfly valve. - Vent / silencer from 3 port 2 position solenoid valve masking a pressure leak from the spring return actuator end-cap gasket each time the solenoid passed air to the actuator. - Fitted actuator kit on the spot and validated repair prior to recommissioning.
	<ul style="list-style-type: none"> - Inlet Isolation Valve - Progressive reduction of travel on the butterfly valve requiring progressive adjustment of the limit switch box NO/NC contacts. - Leak across the 5 port 2 position solenoid valve NAMUR mount interface plate / seals. - Exhaust port speed controller blocked creating back pressure causing the leak. - Replace speed controller and NAMUR interface block seals.
	<ul style="list-style-type: none"> - Filtered Water outlet control valve - Slow actuation resulting in delayed DCS position feedback signal. - Air scavenging due to undersized air supply tubing and leaks in the air supply galvanized pipe run "T" Connection joints. - Calculate & recommend required air supply manifold system capacity increase and add to shut-down work scope.