# REDRAVEN IOT SOLUTIONS FOR VALVES
## Concentrated Solar Power

Concentrated solar power (CSP) plants use mirrors to concentrate the sun's energy to drive traditional steam turbines or engines that create electricity. The thermal energy concentrated in a CSP plant can be stored and used to produce electricity when it is needed, day or night. CSP plants are environments with high temperatures, drastic temperature changes, excessive vibration, extreme characteristics and aggressive ambient conditions. These harsh areas can compromise valve reliability, causing unexpected downtime, expensive valve repairs and diminished plant production.

## Common valve factors affecting CSP operations

- Packing leaks
- Poor control of salt freezing-thaw cycles, leading to:
    - Decreased response time
    - Valve instability
    - Valve trim damage
- Thermal degradation of seals and electronics
- Hydrodynamic noise
- Cavitation
- Mechanical failures due to vibration

## Impact of valve failures

Most CSP plants typically adopt a reactive approach to maintenance, i.e., only addressing valve maintenance once a problem occurs. This approach leads to valve failures, compromising CSP plant capacity and efficiency, and costs plants between $50,000 to $200,000* per day in unscheduled downtime and repairs.



## RedRaven can prevent valve failures

Since most CSP plants do not have control valve redundant systems, a valve failure means the entire plant could be offline. RedRaven can help plants to keep their valves operating at peak efficiency to avoid unplanned downtime and expensive repairs. Plants can use RedRaven to proactively track vibrations, temperature transients, pressure spikes and receive early notifications of friction, packing leaks and toxic salt leaks.

*Harbour Research custom report (2016)*

## RedRaven offerings for valves

**Insight monitoring:** Plants can obtain a detailed view of their valves' health through an online cloud portal and gain access to experienced professionals for analysis.

**Access monitoring:** With this on-premises solution, your plant personnel and Flowserve technical specialists can view aggregated data while on site to make decisions.

### RedRaven compared to other asset management systems

| Feature | RedRaven | Other Asset Management Systems |
|---|---|---|
| **Data** | - Resolution intact<br>- Continuous capture and storage | - Loss of resolution with limited parameters captured<br>- Overwritten on a 30-, 60- or 90-day cyclical basis |
| **Visibility** | - Comprehensive asset health view across multiple sites and asset management systems | - View across a single site with only one asset management system<br>- Incompatible with multiple sites across different asset management systems |
| **Trend/event logs** | - Detailed historical information captured | - Positioner has limited memory and is overwritten via first in, first out (FIFO) log |
| **Failure detection and analytics** | - Packing leaks in control valves<br>- Signature comparison | – |
| **Valve information** | - Links to birth certificate<br>- IOM | – |
| **Expertise on demand** | - Access to experienced professionals for analysis<br>- Failure notification, enabling serviceability<br>- Quick Response Center support | – |
| **Pumps, valves and seals** | - Detailed, holistic information on a subprocess | – |

### RedRaven compared to ValveSight™

| Feature | RedRaven | ValveSight |
|---|---|---|
| **Connectivity and availability** | - Continuous, multiple positioners, readily accessible | - Only while connected to the positioner |
| **Data capture and resolution** | - Continuous capture<br>- Resolution intact | - Snapshot when connected<br>- Resolution lost over time |
| **Sensor types** | - Positioner, vibration, temperature | - Positioner |
| **Alerts** | - Notifications for alarms | – |
| **Positioner visibility** | - Comprehensive dashboard of multiple positioners | - Single positioner visibility while connected |
| **Trend/event logs** | - Detailed historical information available | - Positioner has limited memory and is overwritten via FIFO log |
| **Valve information** | - Links to birth certificate<br>- IOM | – |

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