ValveLink: Future Vision

Presentation and Prototype

September 13, 2019

EMERSON

What you'll see today

Research Recap

Design Principles

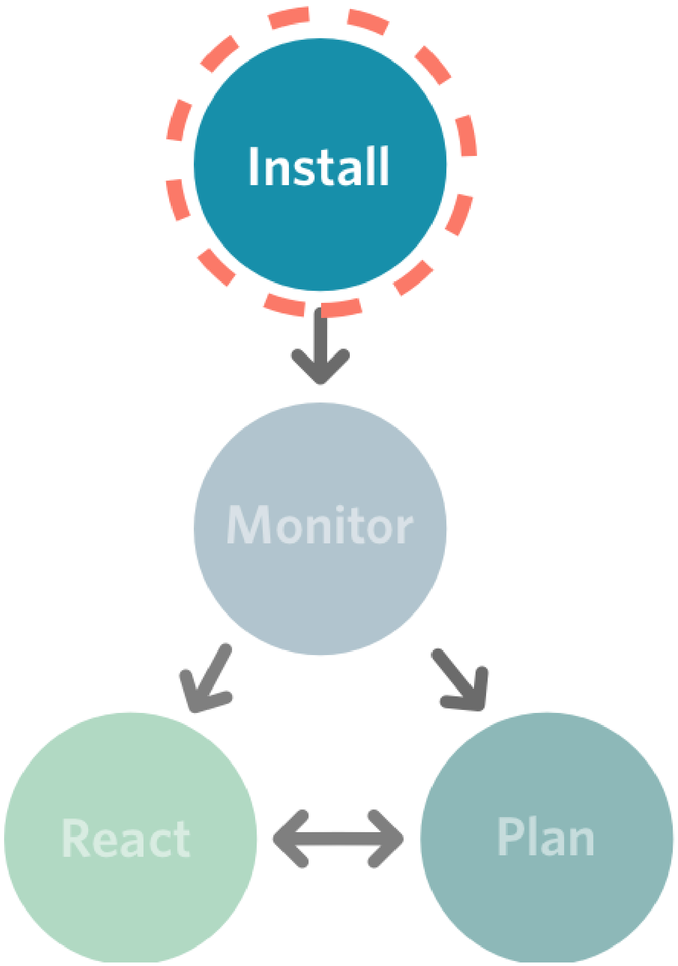
Prototype

Next Steps

Research Recap

Vision Statement

The new ValveLink software proactively monitors valve health and diagnoses valve issues while providing a modern, guided, time-saving experience that inspires confidence and empowers users to keep their valves running optimally.



Install Software

Set-up Software

Users (internal + partners)

Auxiliary Devices

-e.g., Modems, Image Scanning, AR, Voice

-Management Systems (AMS and DTM)

-Licensing

-Apply Template

Tag Configuration

Factory Signature

Template

Initiate Chain of Custody

To-Do List

Baseline Calibration

Calibration Result

Install Device in Plant

Diagnostic for Validation

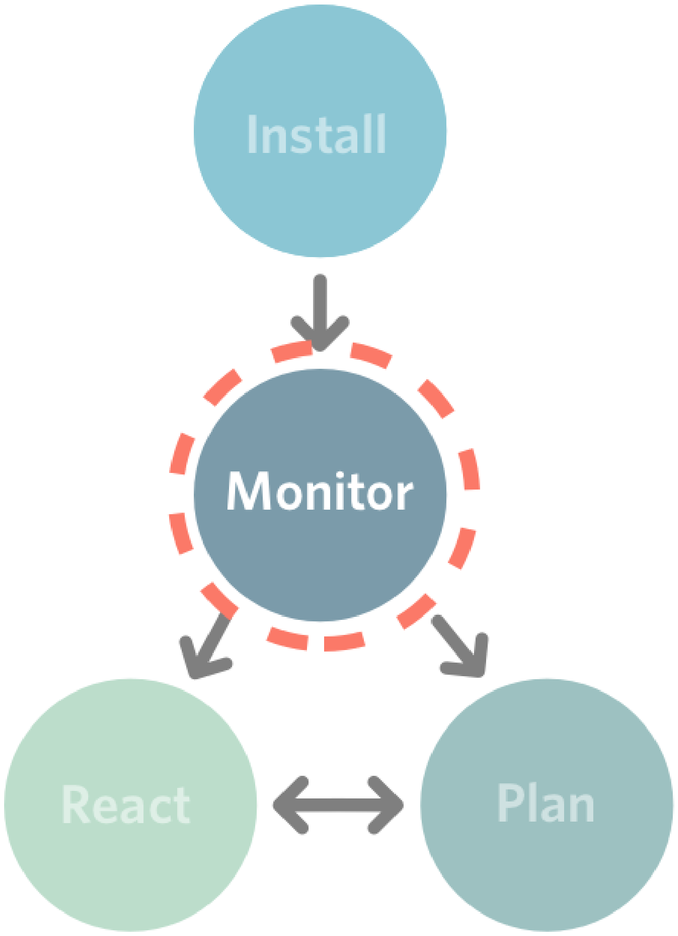
Results

Data Opt-In and Opt-Out

Valve Build Sheet

Lead Times, Ordering info

Share Data with Emerson



Configure Dashboard
Customize Views

User-defined Thresholds

View Valve in Dashboard
Last Connected

Most Recent Diagnostic Data

Sort/Configure

Schedule Monitoring for Valve
Single vs. Batch

Assign Valve Attributes
Criticality

Location

Unique IDs

Group

View Health Trends and Index

View Alerts
Receive Push Notifications

Push into Watchlist

Create Work Order

Ignore

Hide

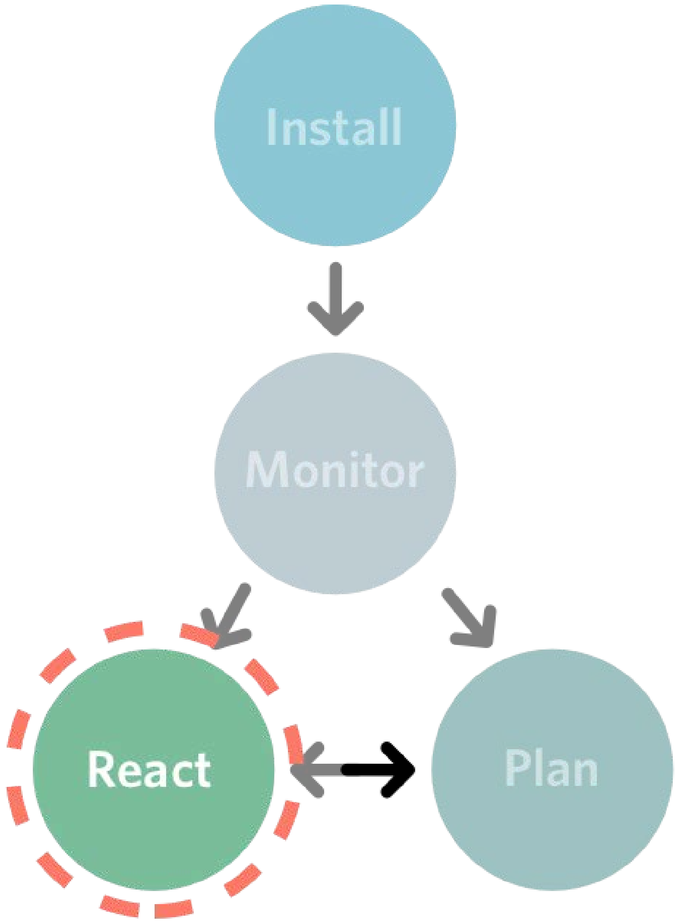
Flag for Planning

Generate Alert Snapshot

Prioritize/Assign Alert

Set DVC Actions
Pull Alert Records

Clear Buffer



View Alert
Actionable Insight
(e.g., your pressure is low)

Guided Troubleshooting
Take Actions
- -Offline Diagnostics
- -Online Diagnostics
- -Manual Inspection and Go to Valve and Adjust it
- -Engage SME and Get Expert Help
- -Work Order
- -Parts Order

Reference Historical Issues
From Single Device

From Plant

From Multi-Plant Enterprise

View Advanced Graph Data
Manipulate View

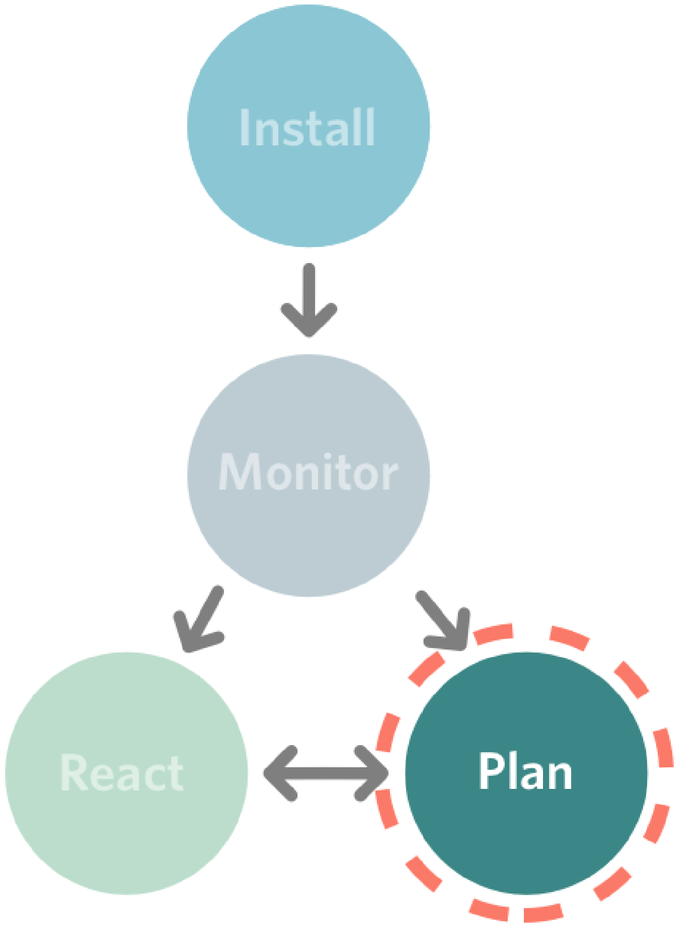
Export

Get Help
How-to Videos

AR Assist

Live Support

Knowledge Base



Manage Plan

Pre-Report

Post-Report

-Share Success

Contact SME for Help

Schedule Activities and Reminders

Manual Task (e.g., replace bracket)

Flag for Manual Data Pull

Work Orders

Parts to Order

Installation

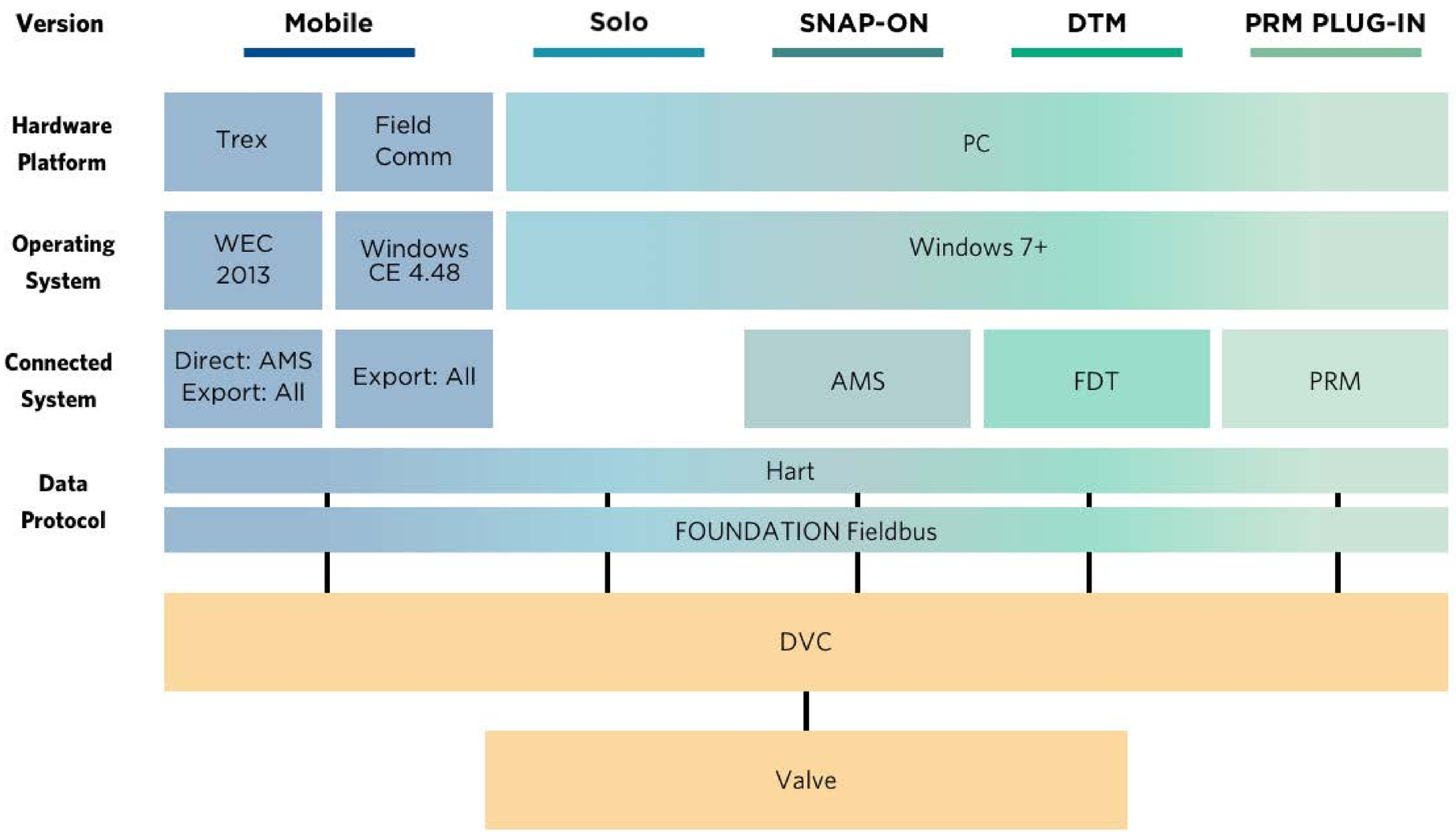
STO Setup

View Calendar

Outage Dates

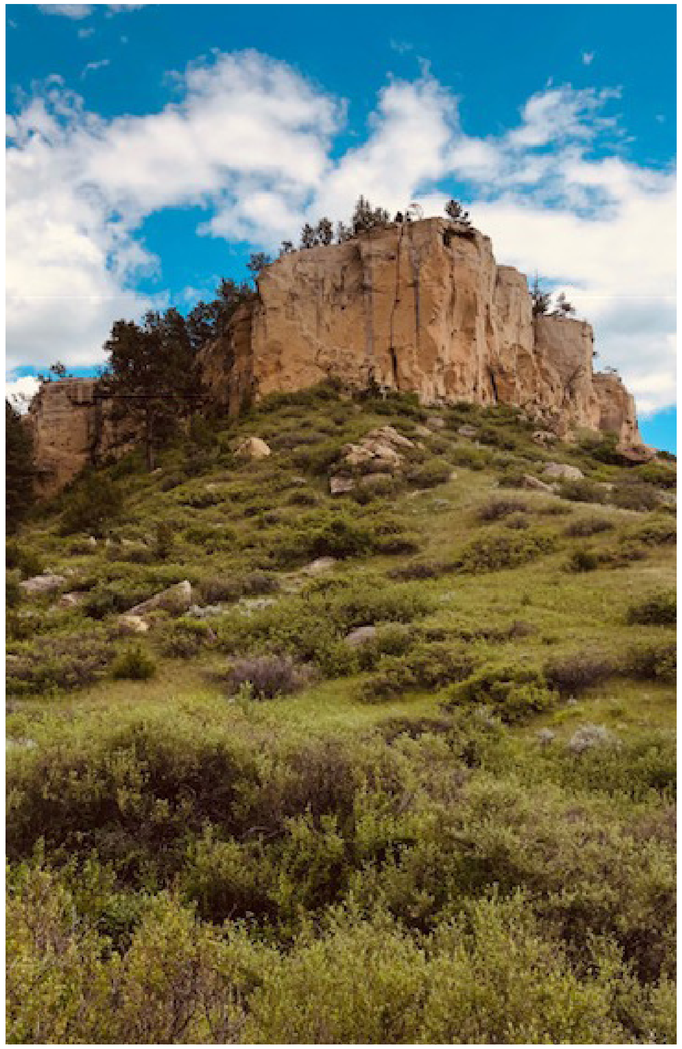
Order Dates

Edit/Remove Item(s)


Version
Mobile
Solo
SNAP-ON
DTM
PRM PLUG-IN
Hardware Platform
Trex
Field Comm
PC
Operating System
WEC 2013
Windows CE 4.48
Windows 7+
Connected System
Direct: AMS Export: All
Export: All
AMS
FDT
PRM
Data Protocol
Hart
FOUNDATION Fieldbus
DVC
Valve

Bayer Crop Sciences
Muscatine, Iowa

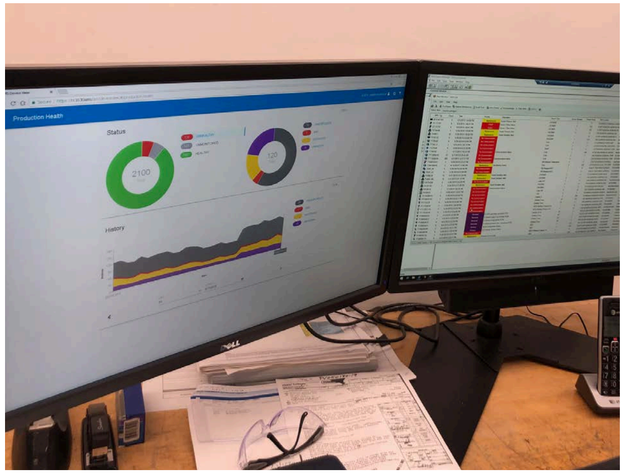
WE Energy
Milwaukee, Wisconsin



CHS Refinery
Billings, Montana

Joel Holmes
Principal Engineer
Bayer Crop Sciences, Muscatine, Iowa

“In my mind, if you open up ValveLink you should come to a menu or some sort of system with buttons to take a recommended action. Something intuitive!”



Bob Vigansky
Computer Instrument Technician
WE Energies, Milwaukee, Wisconsin

“I would like to have the ability to look at this device and look at historical data, not live data. I want a way to open up the valve within VL without having to look at the status monitor live. I want to look at the dynamic scan, or past data, without taking the time to go find the device.”

“ValveLink should allow for image upload for the TAG, not just the task…and the ability to scribe notes!”

Ken Paulson
Process Controls Engineering Supervisor
CHS Refinery, Billings, Montana

"The user environment of mobility is a big deal.... There is a lot of effort at this refinery and others to talk about what we want to look like in the future with respect to mobile tools. We want a commercial, off the shelf tablet that we can wander around and use different tools. "

"It would be massively beneficial to be able to take a picture of the tag itself and store that data since we have QR codes attached to each tag."

"Augmented reality could be valuable to communicate from group to group."

Dashboard

Customization

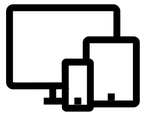
Grouping: Zones, Valve Type, and Criticality

View trends for valves and groups

Customize glanceable data and sorting and filtering by chosen values

Monitoring

Allow monitoring and other diagnostic needs to be run dynamically and conditionally



Platform

Device-agnostic experience

Create an experience that can be deployed and accessed on any preferred device or OS

Connected Experience

Ensure that the platform is built to accommodate both solo and fully connected functionality, striving for feature parody.

Alerts

Actionable Insights

More information alerts

Provide direction on what to do next

Base on historical, universal data

Monitoring

Ability to stash, dismiss, and snooze alerts

Add date-related data and trends

Create a clear and easy to understand alert labeling system

Predictive logic and settings to better surface alerts that matter to the user

Tools

Batch Runner
Simplify the process, reduce clicks

Wizards
Revamp wizards and support methods for set-up, installations, etc.

-Including step-by-step instructions

Search
Create a robust and dynamic search

Third-Party Services
Allow integration with work order systems and other auxiliary applications

Data

Valve Data
Make comparing records more accessible and informational

Offer ability to perform trend analysis

Scratch Pad
Tag-specific notes that persists through incidents and interactions

Track, per user, what has been done to each tag

Preventative Maintenance Value Proposition
Longer valve life, recommended replacement parts

Syncing
Automated and easier to manage

Help
Revamp help strategy to better support users

Calls to Action and Affordances

Need more directives, hints, and relevant tasks surface

Actionable information should be presented with affordances to move to the next step of the task

Balance Spatial Allocations and Create Hierarchies

Too much unused screen space while working areas are cramped and hidden

Allow resizing and expansion and collapsing of areas

Need to prioritize menu items and affordances within working spaces to create visual hierarchies

Iconography & Menus

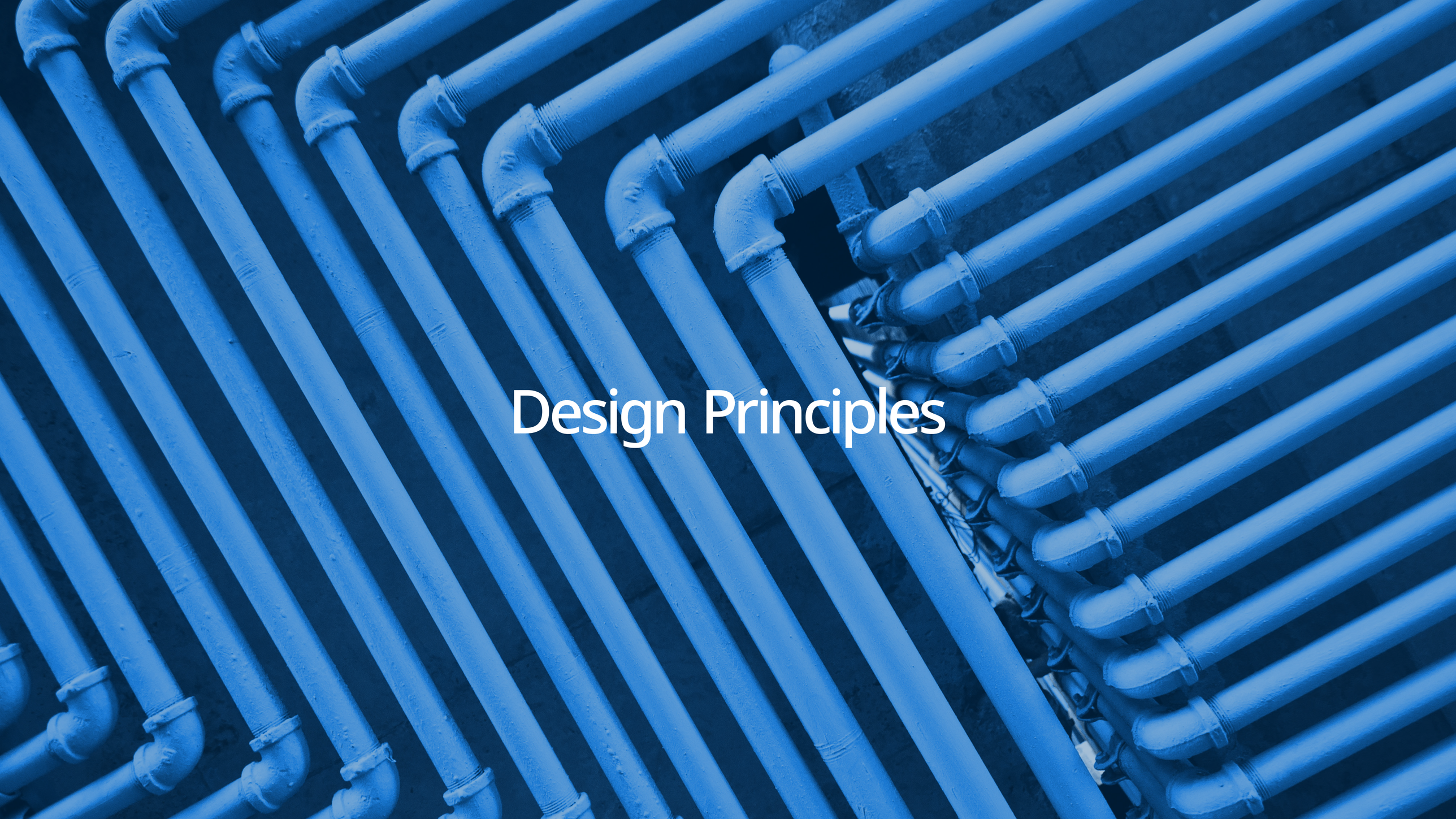
More intuitive icons, potentially keep text labels visible or optional rather than rely solely on hover tool-tips

Need clearer separation between universal vs contextual task menus

Feedback

Need better visual communication of latency and load times for data transfers

Not enough validation checks (“are you sure?”) when completing irreversible actions (TREX)



Design Principles

Design Principles

Modernize the ValveLink design style while ensuring a consistent, usable core experience that can be translated across devices

Exercise restraint (less is more), with a design approach that considers the user's environment and respects their time

Introduce additional features and functionality with a modular mindset so the design can be extended without undermining the core experience

Branding Elements
color

We chose a monochromatic blue color scheme as a nod to Emerson, as well as ensuring the data remains the focus. A monochromatic primary color palette will draw the users' eyes to the alerts and/or health scores.

Primary

Alerts

Health Scores

Branding Elements
typography

Noto Sans, made by Google, is intended to be visually harmonious across multiple languages, with compatible heights and stroke thicknesses. Noto Sans is legible in all sizes and compliments the data. Noto Sans also feels stylisitcally close to the Emerson.com Whitney ScreenSmart.

Nn

Noto Sans

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ghijklmnopqrsštuvwxyzžАБВГҐДЂЕЁЄЖЗSИIЇЙJКЛЉМ
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ΛΜΝΞΟΠΡΣΤΥΦΧΨΩαβγδεζηθικλμνξοπρστυφχψωάΆ
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Regular	**Bold**
Regular Italic	***Bold Italic***

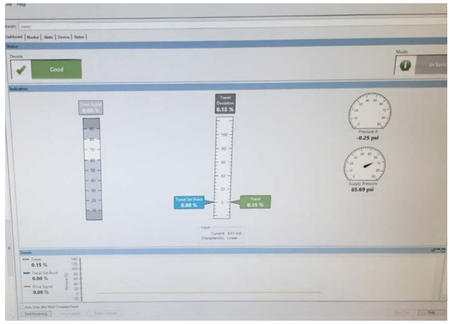
Branding Elements
logos

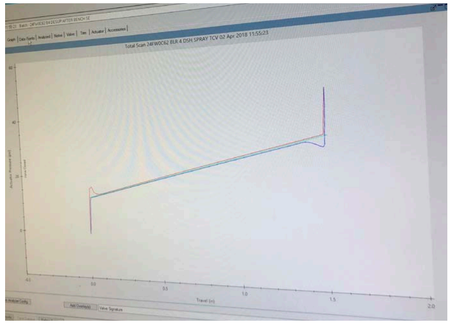
The ValveLink word mark is based off Montserrat Black Italic. We chose this base font to represent strength and industrialism. The forward slant embodies the movement of fluids through industrial plants.

The VL secondary mark is taken from the “V” and “L” from the main logo, and is connected. This represents how pipes, valves, and fluids are intrinsically connected.

Design Principles

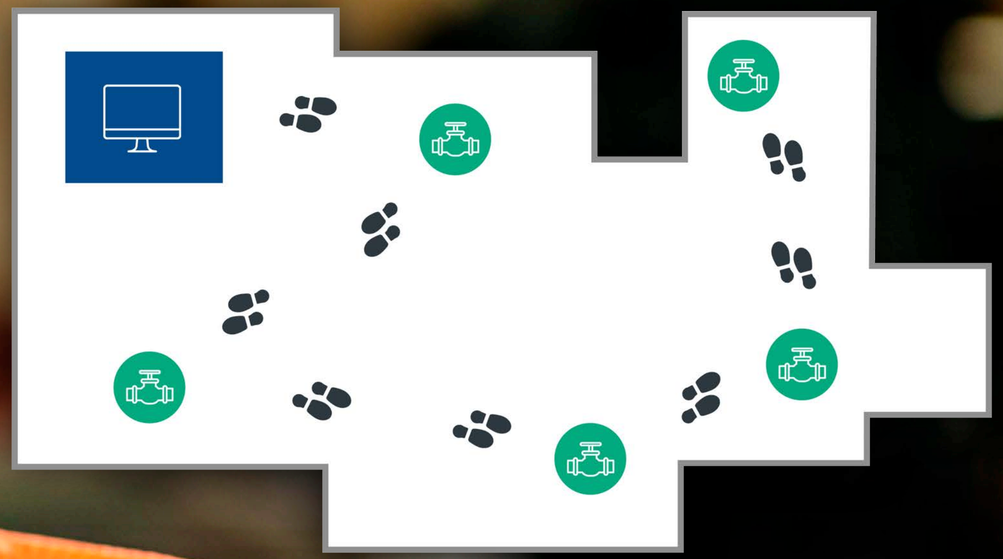
From / To





From	To
No clear home base or starting point	Customizable dashboard with key summary data
Disorganized navigation and information architecture	Navigation grouped by system, universal, and contextual tasks
Information buried behind blank screens and modals, requiring multiple clicks to discover	Glanceable, easy-to-access key tasks and prompts to action
Complex configuration and validation processes	Step-by-step instructions and intuitive confirmations
Steep learning curve requires advanced engineering experience	Simplified interface guided by actionable insights

Engineer's Environment



Prototype

Next Steps

Next Steps

Usability Testing at Emerson Exchange (9/23 & 9/24)

Design Sprint Cadence: 4 x 3-week sprints

Sprint 0

Requirements gathering & initial prioritization of tasks

Kick-off on 10/1

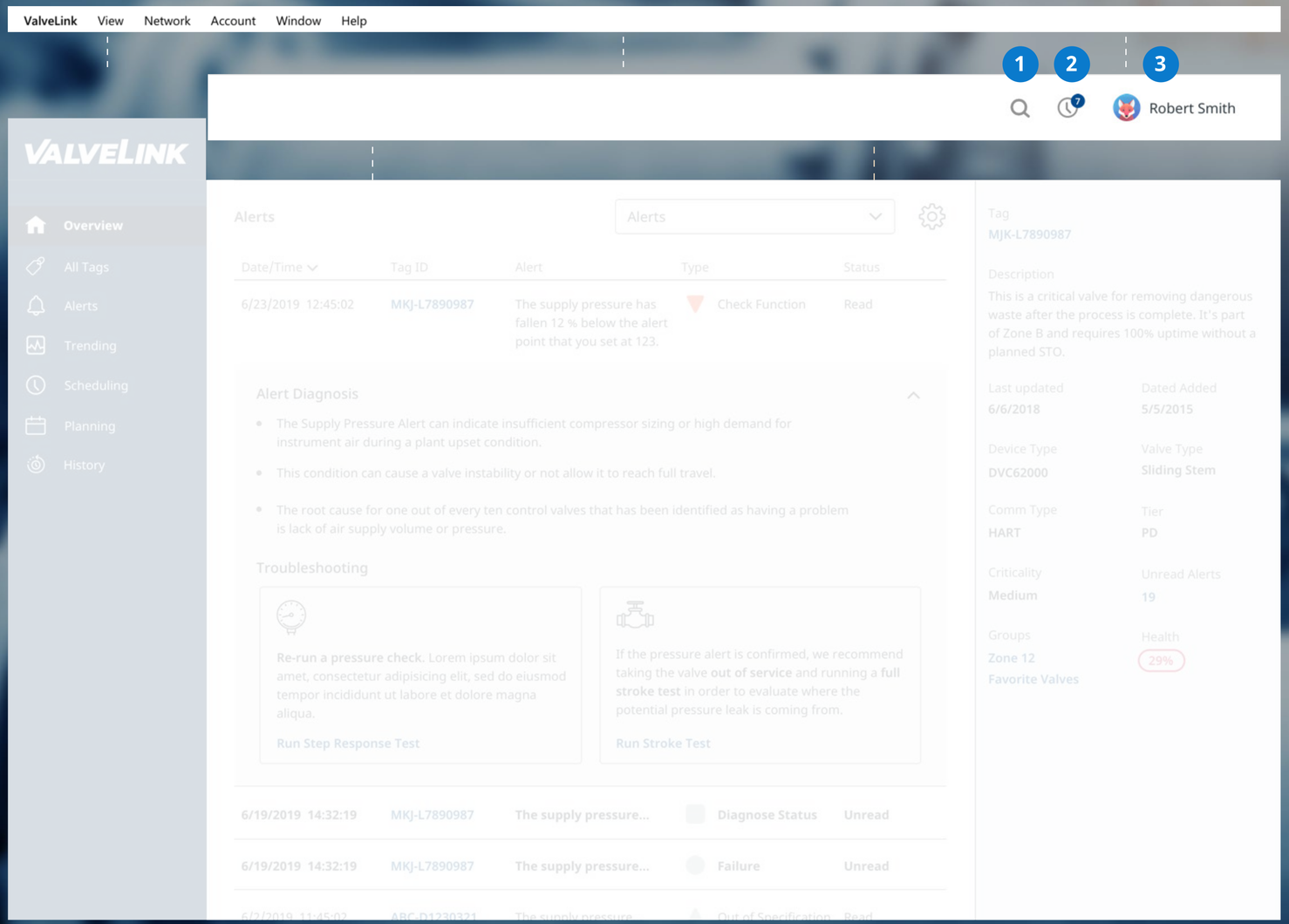
Sprint 1, 2 & 3 - Design Sprints

KO: prioritize features from requirements backlog

Midpoint Review: execute on prioritized tasks

Final Review

Appendix



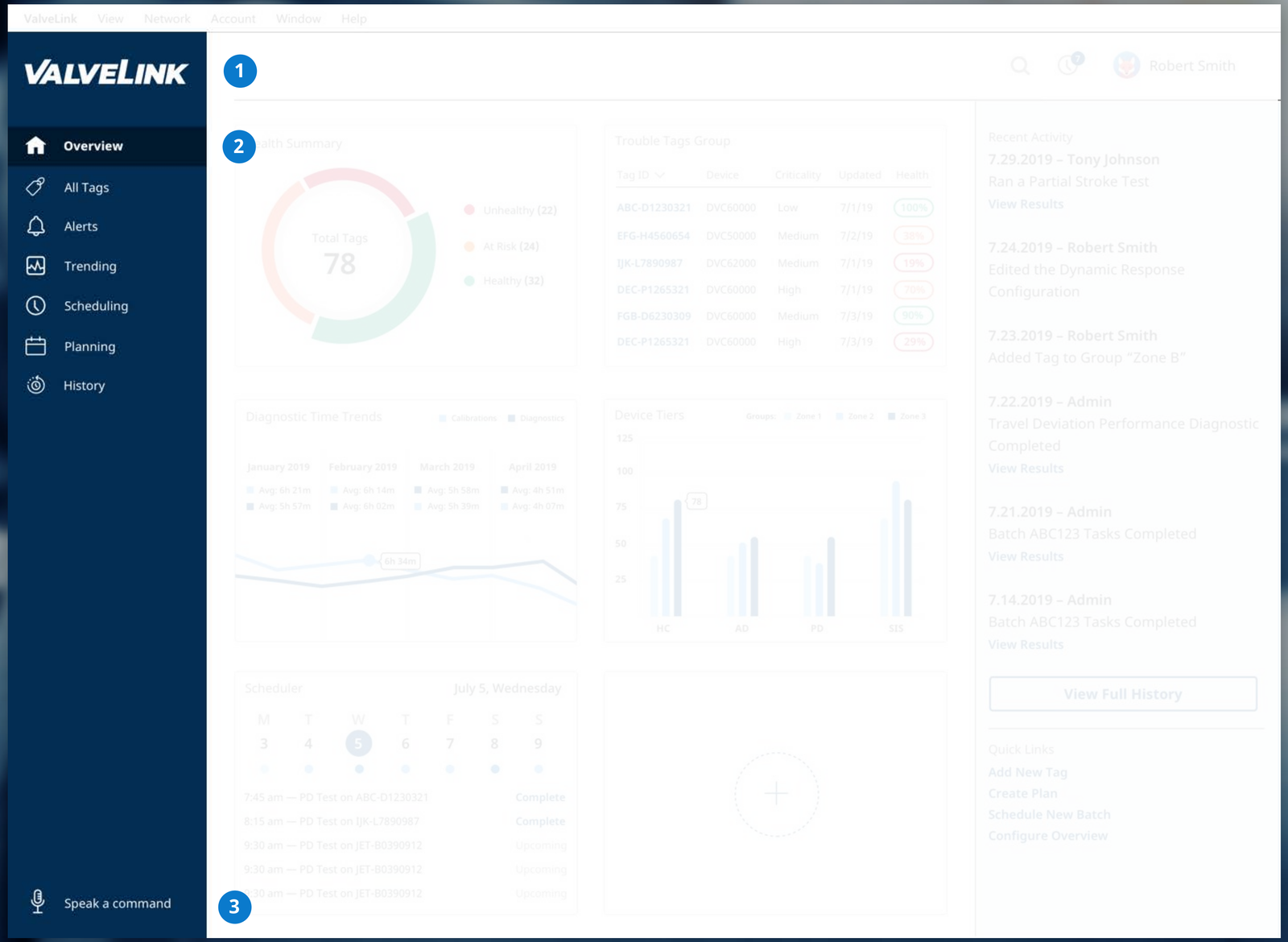
System Settings

The System Settings bar appears as a thin white strip above the ValveLink logo. It includes system-wide controls, such as system-level preferences, system help, network configuration, license information and other administrative settings.

Top Navigation

The Top Navigation area appears as a thin white strip above the main user interface and below the system navigation. It includes search (and type-ahead search), scheduled tasks, and last logged in user/profile.

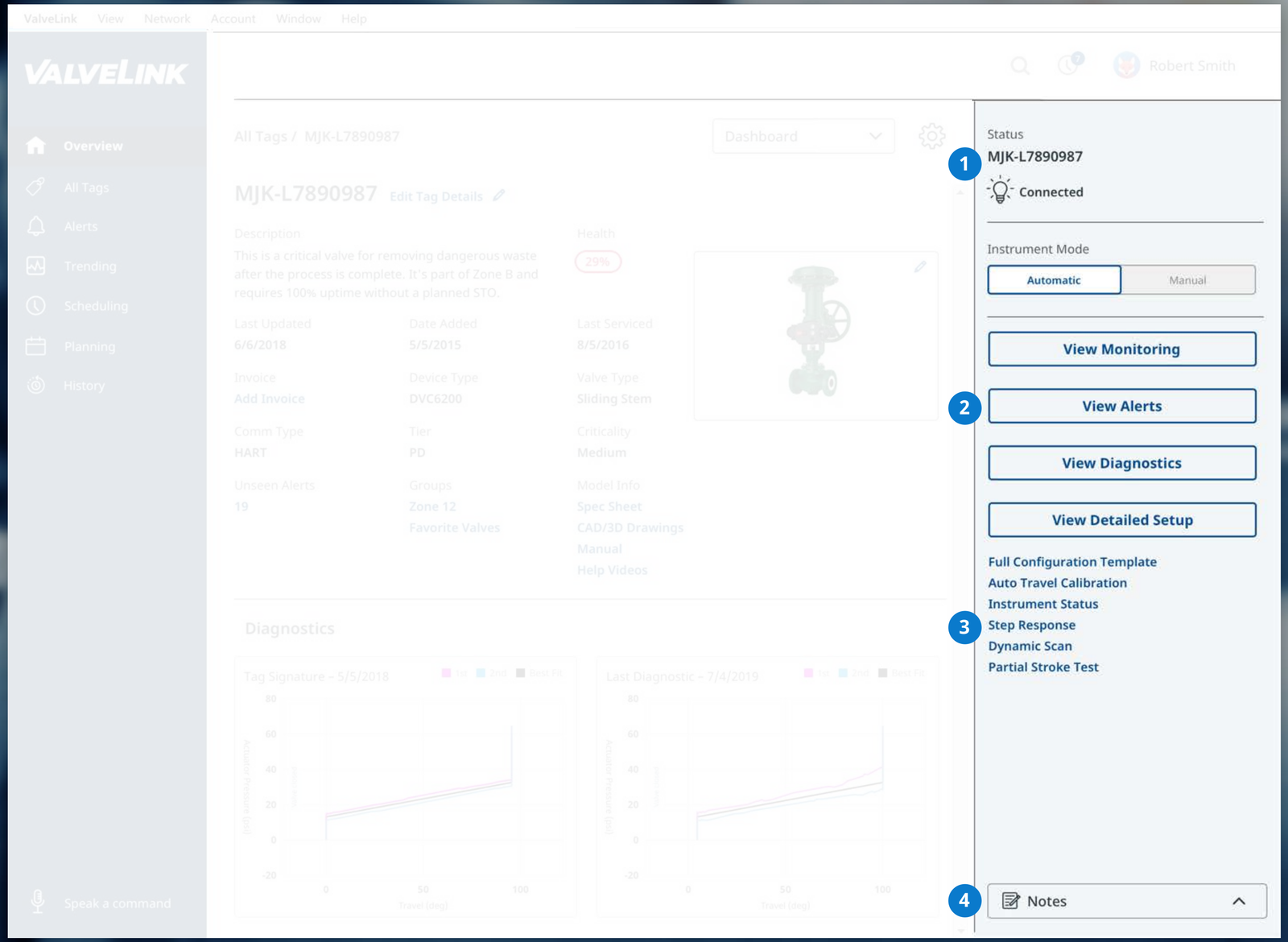
1. Search with predictive results
2. Scheduled tasks
3. Logged in user



Main Navigation

The Main Navigation is the vertical blue strip that appears immediately below the system settings strip. It includes the ValveLink logo, the top sections and related sub-tasks, and an area for voice-based interactions. The main Navigation can be collapsed to add more real estate to the center area of the user interface. The Main Navigation represents a key branding area for the new ValveLink experience.

1. Logo
2. Top sections & sub-tasks
3. VoiceLink command area

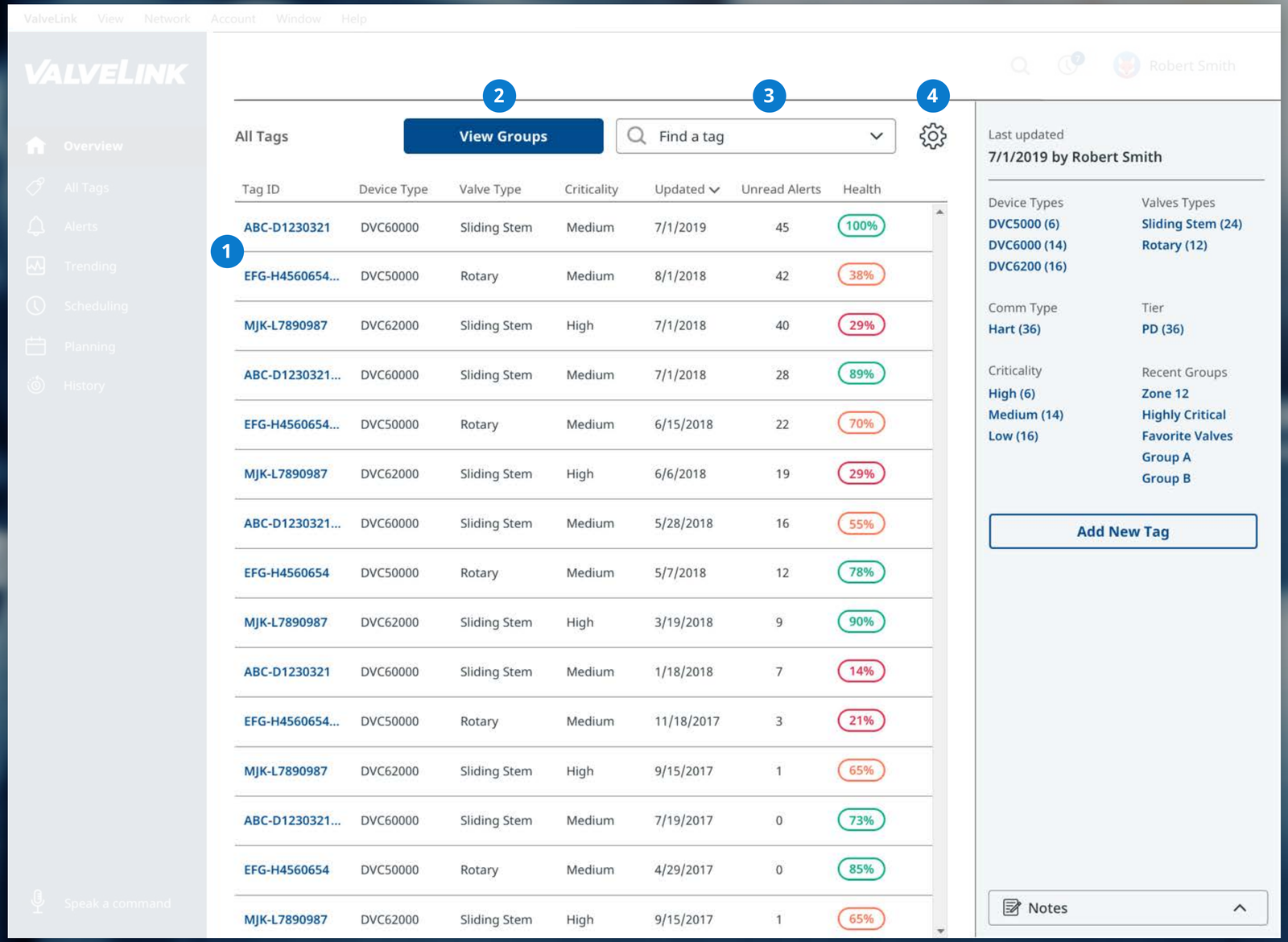


The Right Panel

The Right Panel is the vertical, powder blue strip that appears immediately below the top navigation. It includes contextual information, calls to action based on the content interactions available to the immediate left of the right panel, and access to create or view related notes.

1. Contextual Information*
2. Primary CTAs*
3. Secondary CTAs*
4. Notes

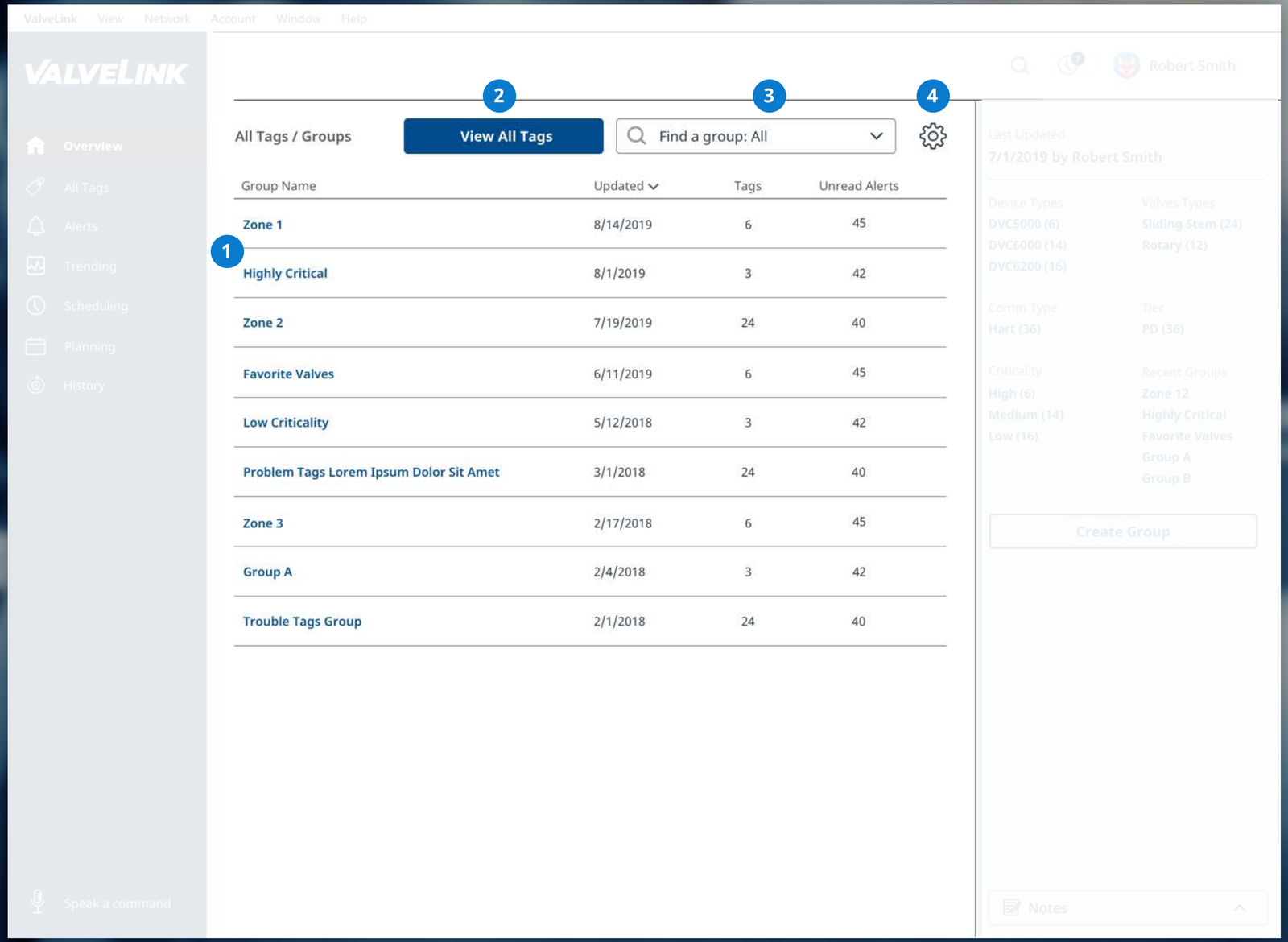
*Will vary depending on content in the central section of the user interface. In this case, the Right Panel supports the a Tag Details page.



All Tags

The All Tags view is a primary experience of the software. The All Tags view appears in the center area of the user interface, and lists all tags that have been added to the application. It includes structured data about each tag, which can be sorted and filtered to adjust to the user's needs. The All Tags view also includes a scoped search mode to find specific tags, as well as a link to view tags organized into Groups.

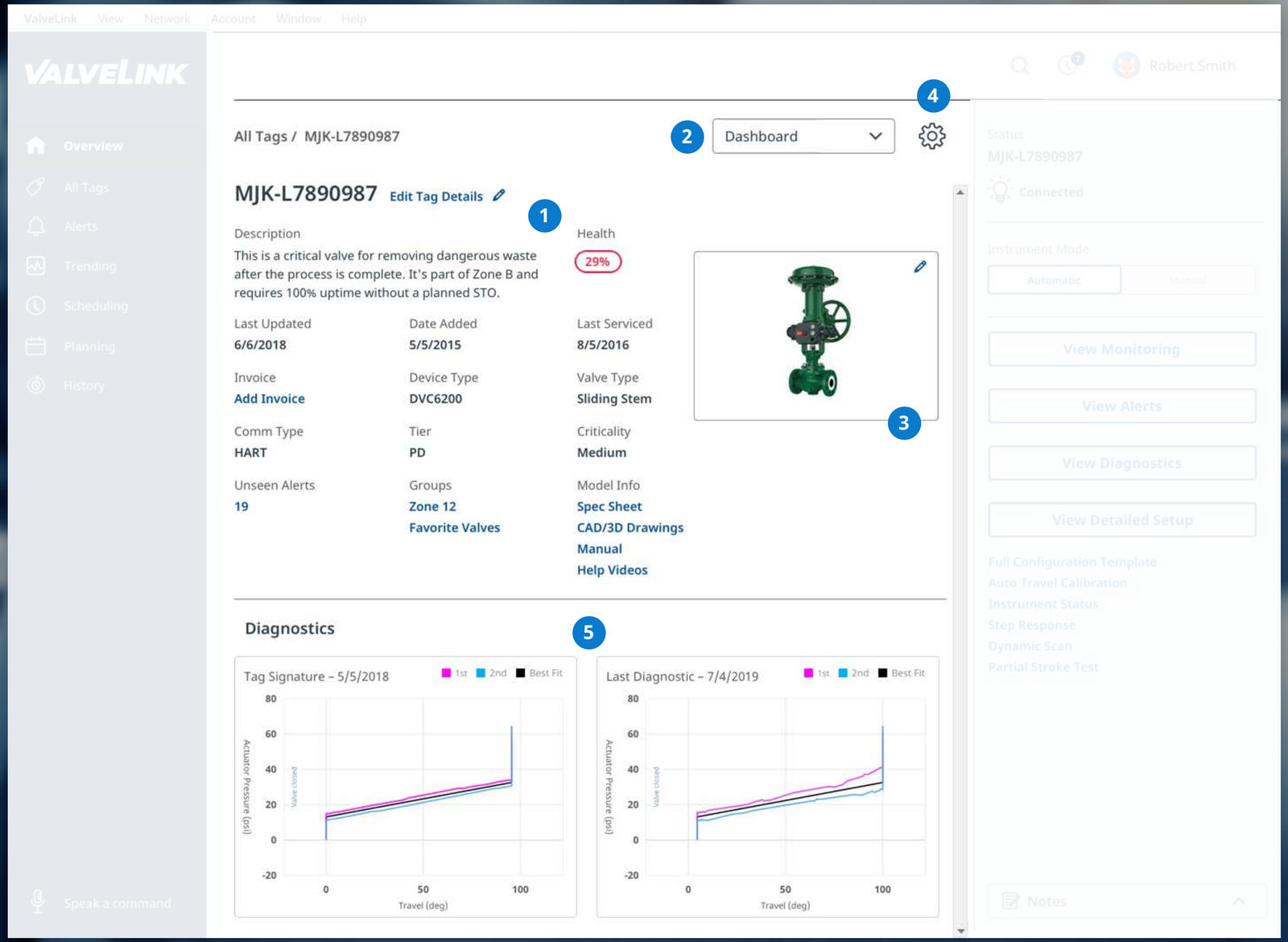
1. Tag summary details w/ VL Health Score
2. Tag Groups access
3. Tag search
4. Contextual settings/controls



All Groups

The All Groups view is a sub-view within the All Tags section of the application. It includes all created groups as well as the ability to create new groups and add tags to existing groups. Groups can be added to batch scheduling.

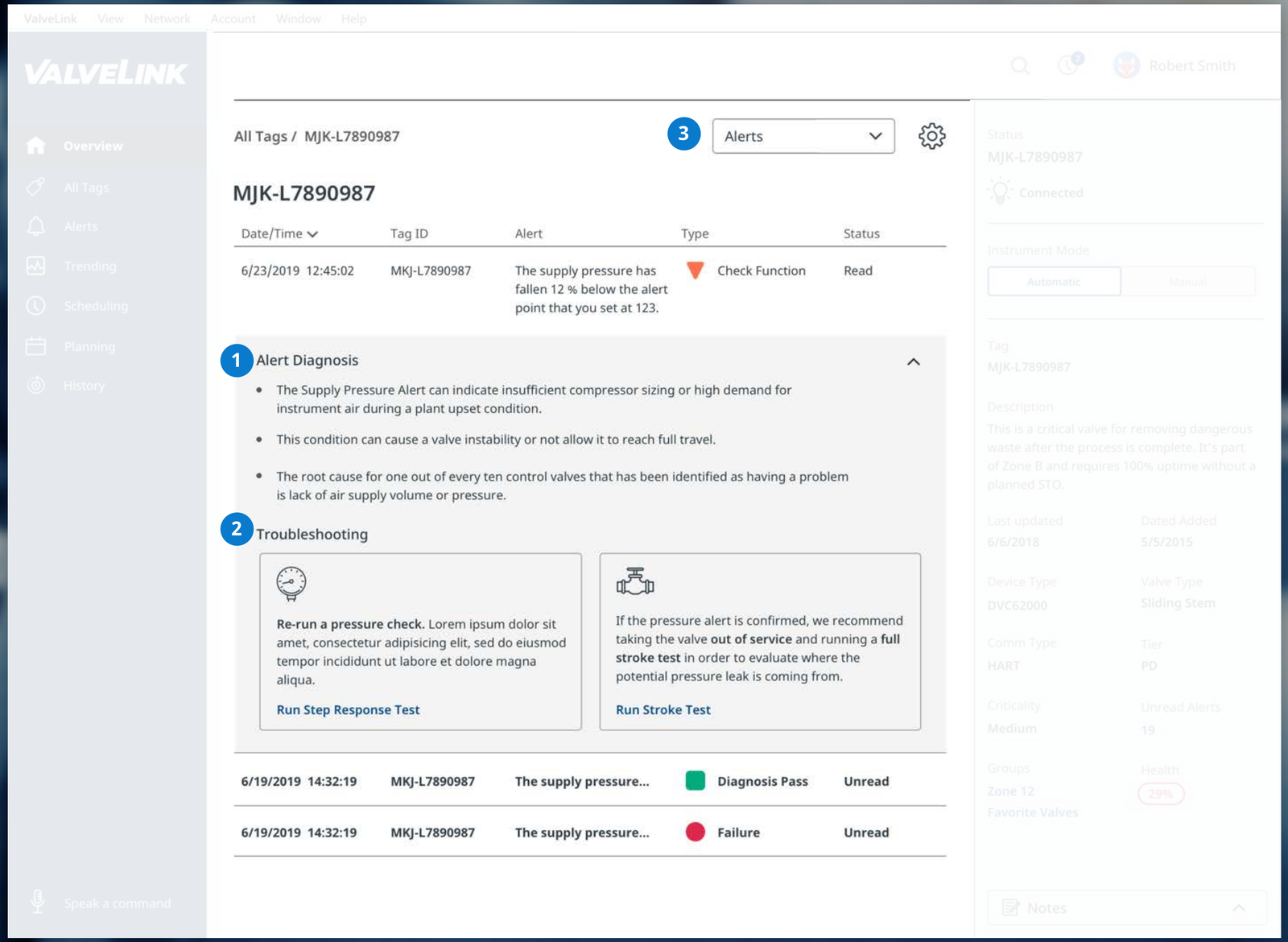
1. Group summary details
2. All Tags access
3. Group search
4. Contextual settings/controls



Tag Details

The Tag Details view includes all of the detailed information associated with a singular tag and its constituent parts. The Tag Details view includes a drop-down menu with access to all key sub-sections within the Tag Detail.

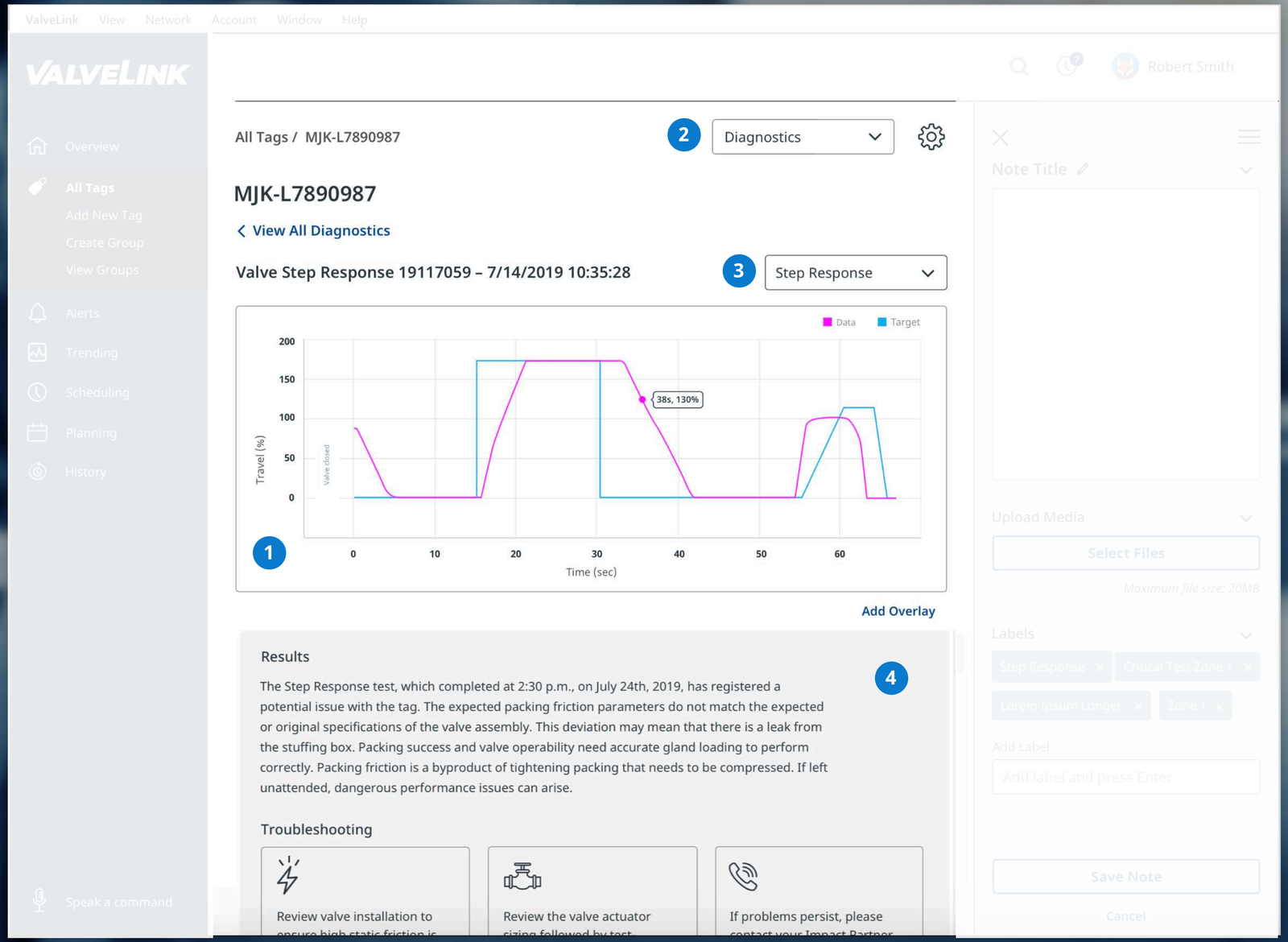
1. Tag information/meta data
2. Tag drop-down menu
3. Tag image (factory, CAD, user-generated)
4. Contextual settings/controls
5. Diagnostic results
6. History (not pictured, scroll to view)



Tag Alerts

The Tag Alerts list is a sub-section of the Tag Details view. The expanded view provides an alert diagnosis and actionable insights.

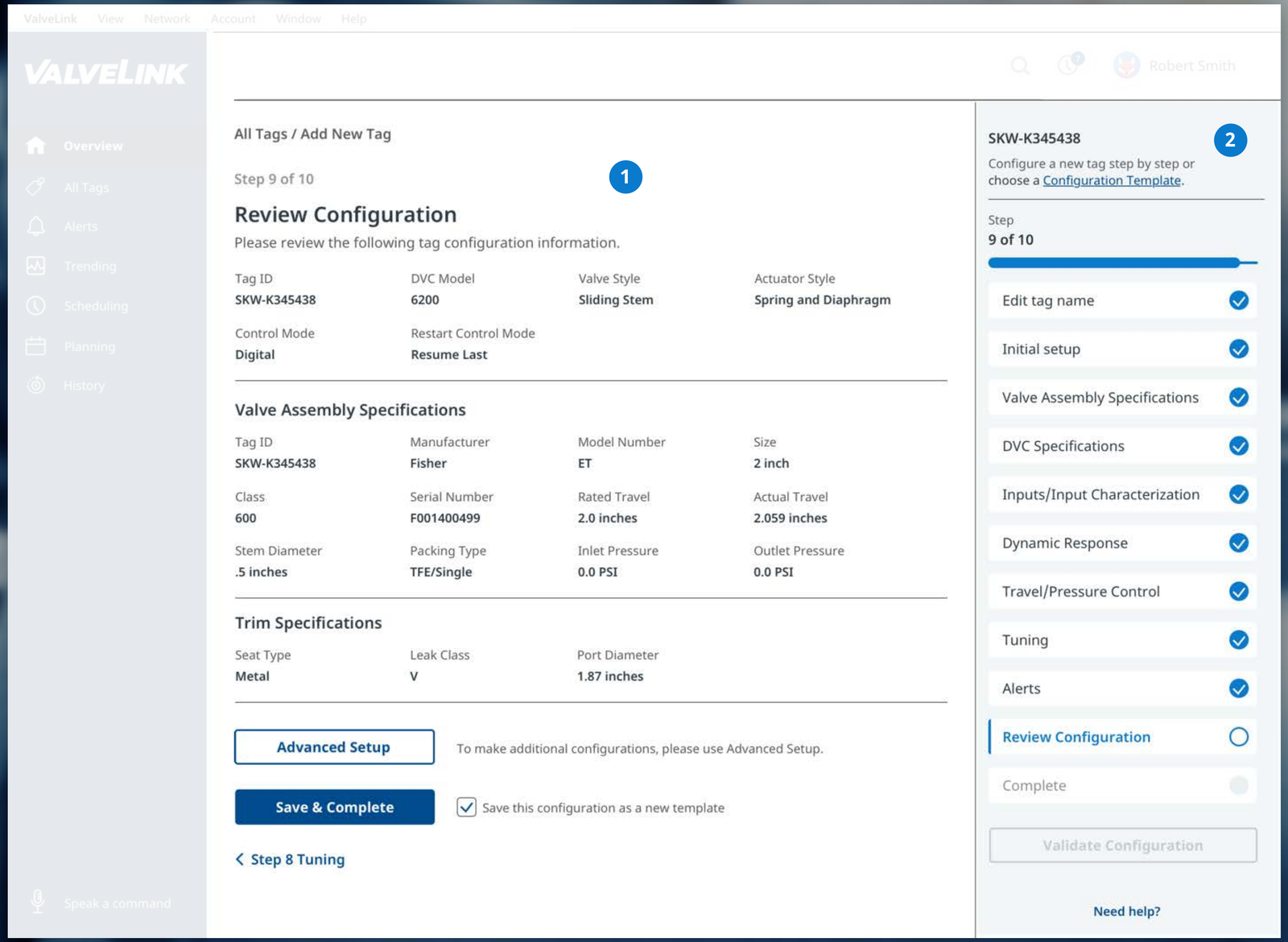
1. Alert diagnosis summary
2. Troubleshooting advice
3. Tag drop-down menu



Diagnostic Result

The Diagnostic Result page appears as a sub-section underneath a Tag Detail page. It includes the detailed results of a diagnostic, as well as access to view all diagnostics. The Diagnostic Result page includes the results of the test, recommended actions, and the complete data set of the results.

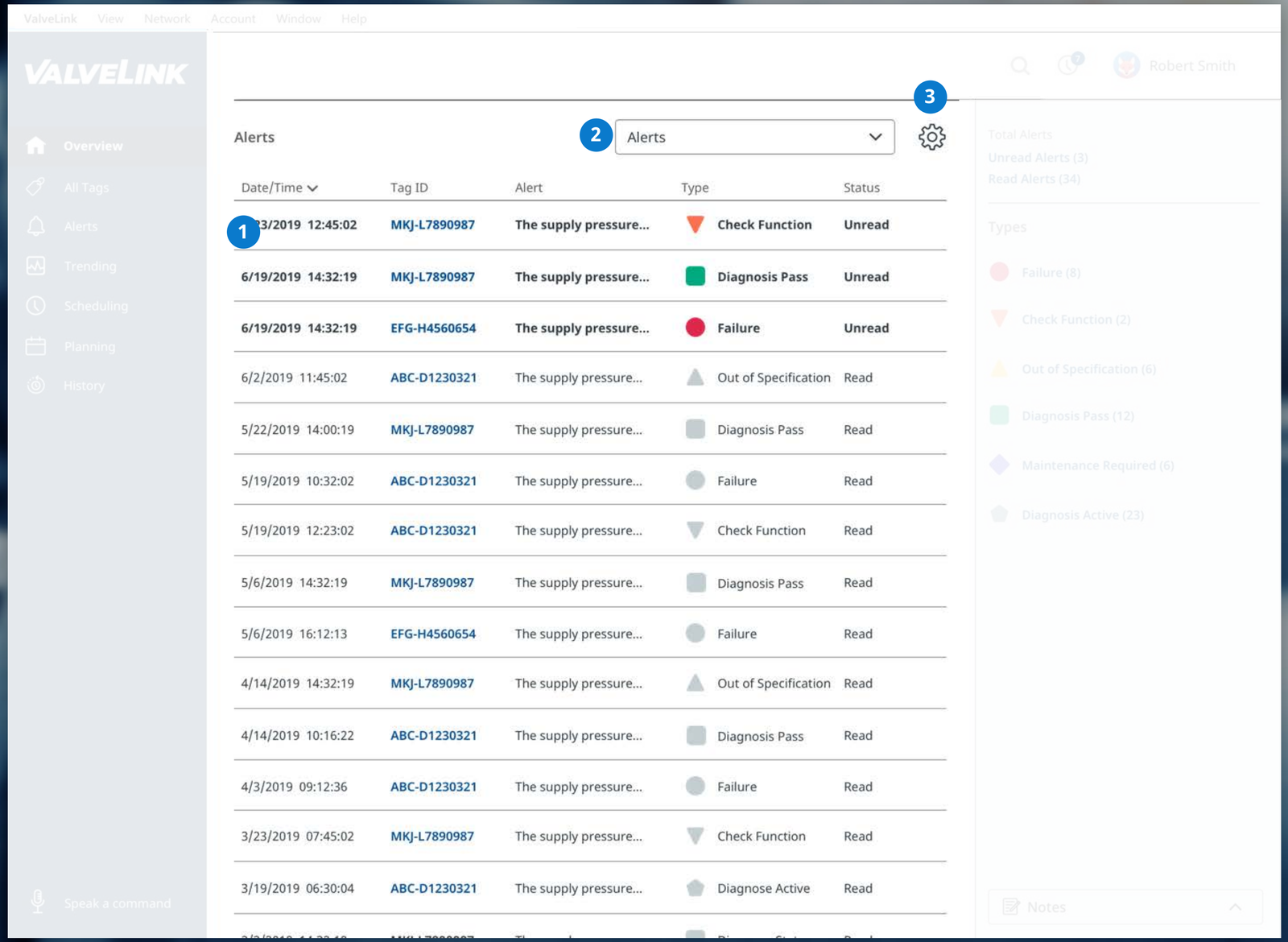
1. Graphical result
2. Tag drop-down menu
3. Diagnostics drop-down
4. Results summary/actionable insights
5. Data set (not pictured, scroll to view)



Add New Tag / Configuration

The Configuration section allows a user to add a device to ValveLink, and make adjustments to the configuration values specific to their plant or facilities needs. Users see the progress of the configuration in the Right Rail of this section.

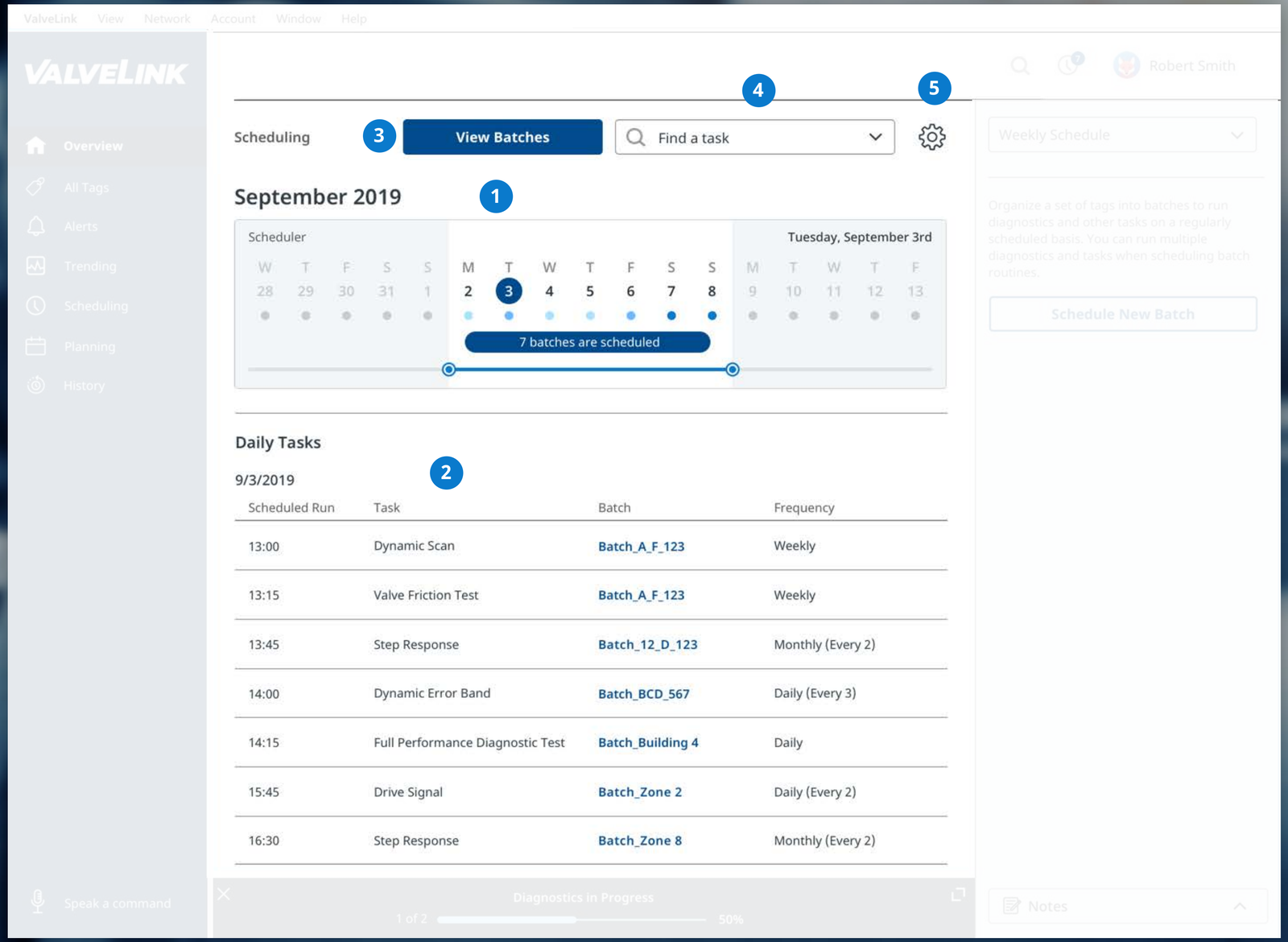
1. Configuration area
2. Progress area



Alerts

The Alerts section contains a sortable, customizable list of alerts. On click, the alert details expand within the list.

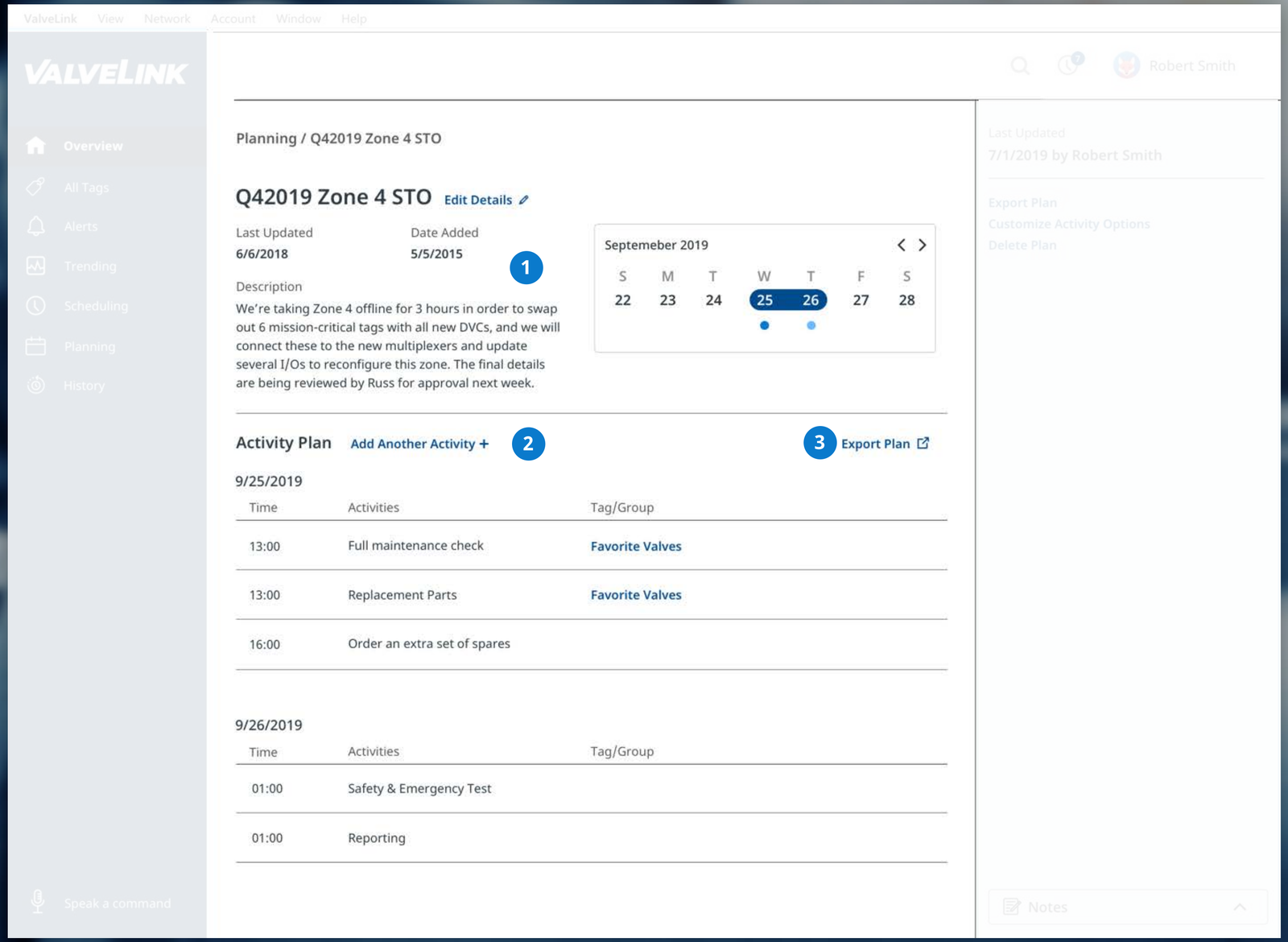
1. Alert list
2. Alert scoped search
3. Alert settings



Scheduling

The Scheduling section allows a user to schedule one or multiple tests for one or multiple tags on a recurring basis. Users can view all scheduled tests through the main Scheduling page. Users can create new batch tests or view the complete list of scheduled batches within this section of the software.

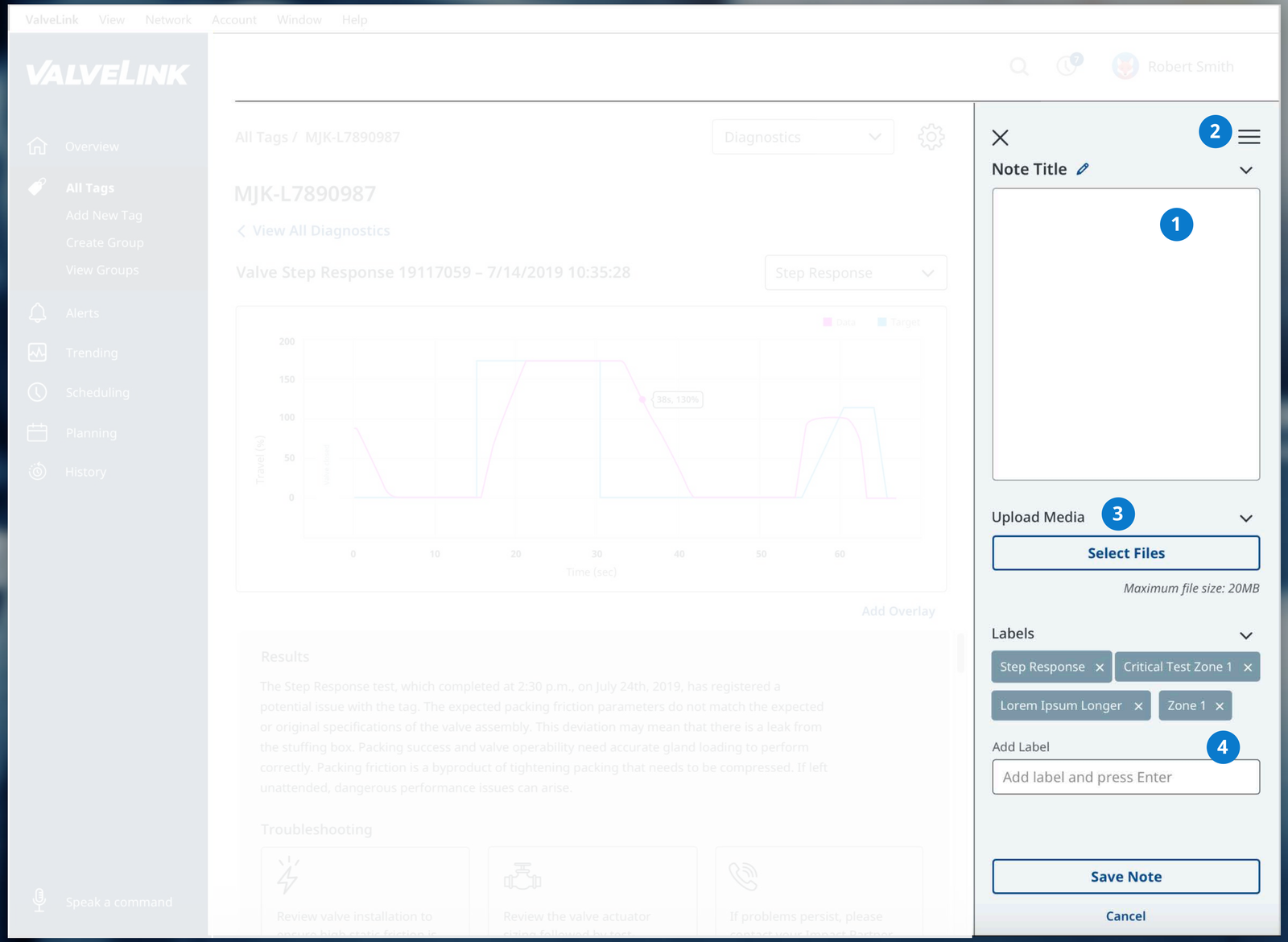
1. Calendar view
2. Task view
3. View batches
4. Search for tasks or batches
5. Scheduling settings



Plan Detail

The Planning section allows a user to create a plan for an STO or other events that requires downtime or special consideration. The Planning section includes the functionality to create, edit, and view plans.

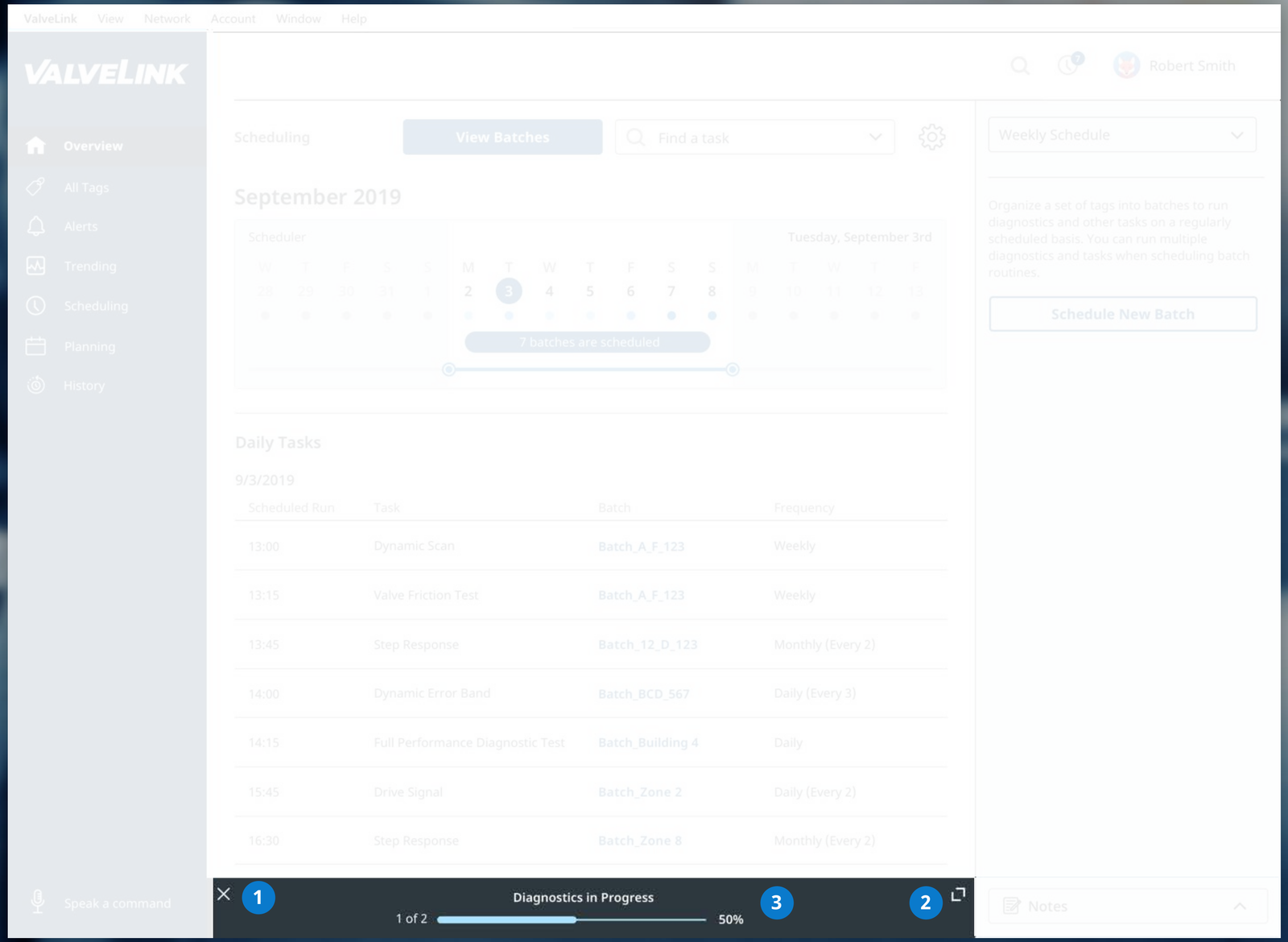
1. Summary view
2. Planned activities
3. Export plan
4. Create plan (not pictured)
5. Plan List (not pictured)



Notes

The Notes tool appears at the bottom of the contextual Right Panel. When selected, it expands vertically and fills the Right Panel area. The hamburger menu provides access to all notes related to the tag and all notes management.

1. Notes field
2. Notes menu
3. Upload file
4. Add label information



Task Status Tray

The Task Status Tray includes a list of all currently running diagnostics and tasks. The user can expand the tray to view all in-process tasks, or minimize it to see a rolled up view of the time left for all tasks. Selecting “X” closes the tray. It re-appears once a diagnostic or task is complete (depending on a user’s settings). Users can select “View Results” to go the completed diagnostic or visit the History or Scheduling sections to access results.

1. Close
2. Expand
3. Progress bar

VALVE INK

The Vision

The Engineer By 2023

Voice commands inside

Visor interfaces outside

Seamless ERP/system integration

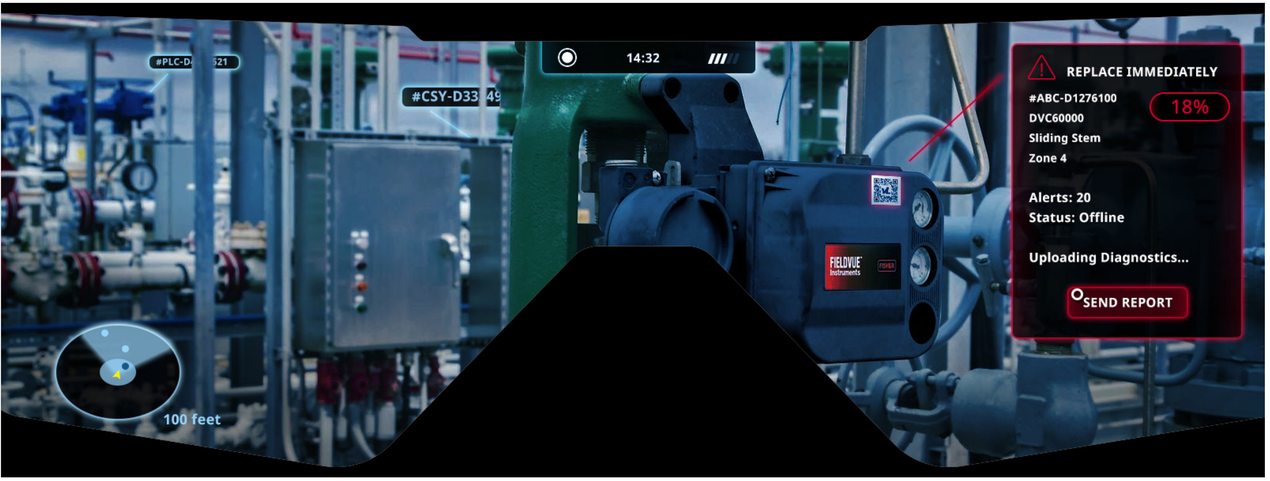
Other modes to consider for 2023

Gestural

Facial recognition

Plug-and-play (built-in with all valves): program automatically generates the data you need to view

No interface at all, just generates alerts and reports



The VL Visor

An essential part of the outdoor experience

AR experiences

Elements of gamification

Identifies all valves in range

View DVC alerts in real-time and actionable insights

Video teleconference with Impact Partner for real-time troubleshooting

Record video and use voice to input

Voice

External environments are too loud

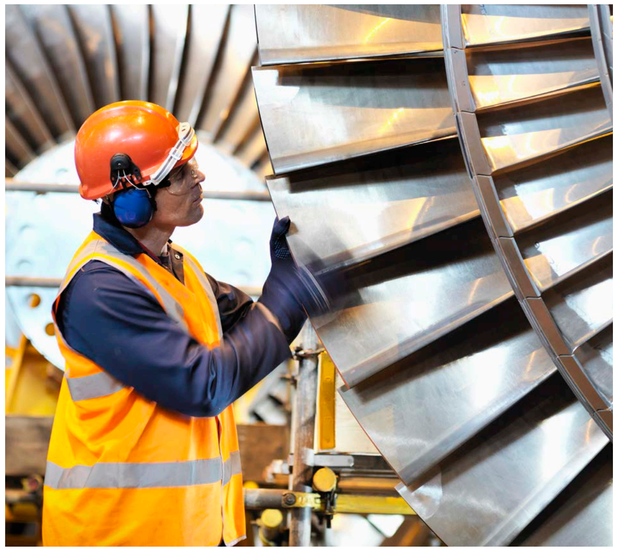
Limits scope of voice opportunities unless combined with noise canceling technology and mics

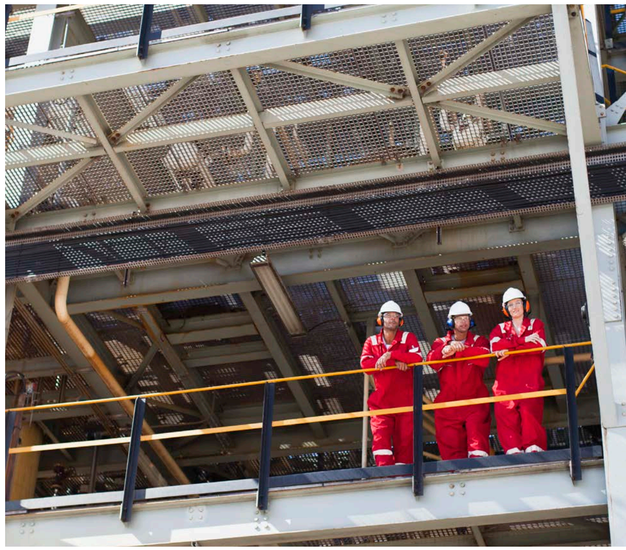
Internal environments may be suitable

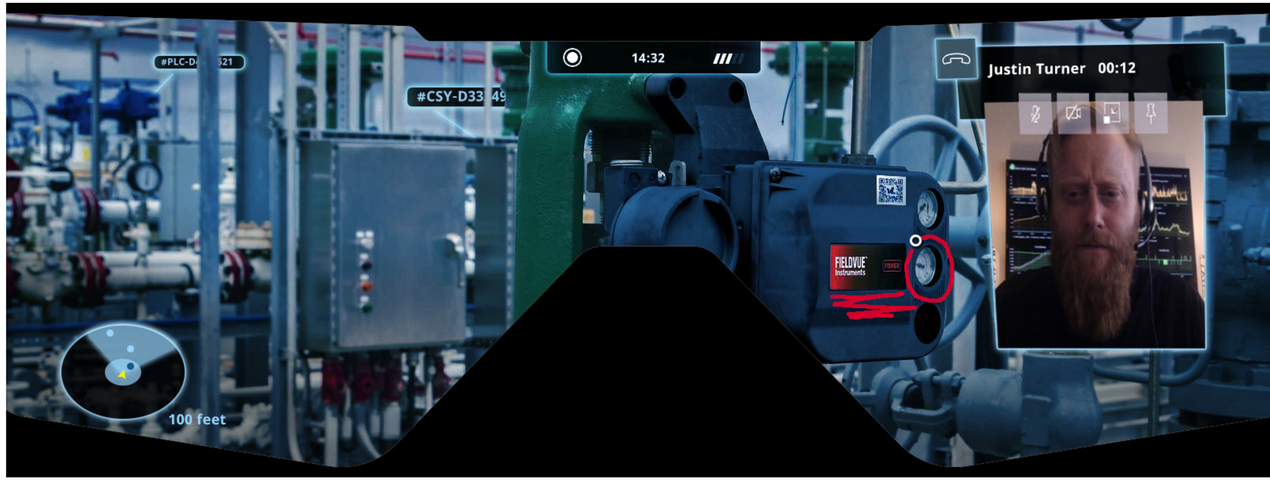
Voice commands within a control room

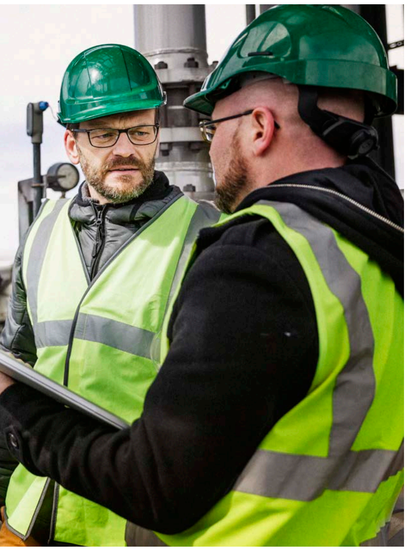
Toggle to voice mode

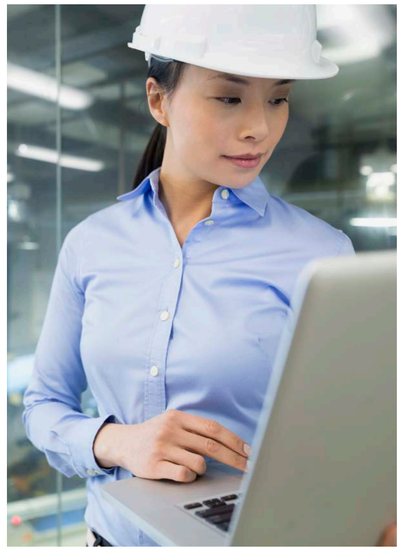
Voice command is the equivalent of a hot key by 2023

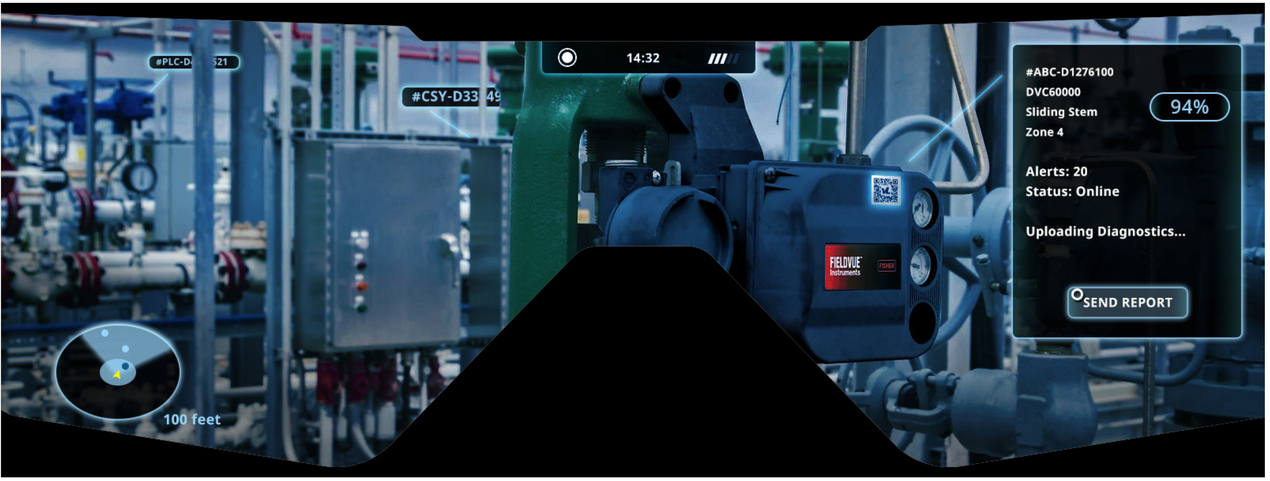












Gamification

Engineer Profile

Incentivize engineers to be more productive and active with ValveLink by gamifying their accomplishments in ValveLink

Ethical questions to consider:

Only viewable by individual engineer?

Can supervisor view?

Or stats only reflect entire team’s accomplishments?