

## **ASVIEW™ - BRIDGE AID**

**ASView Bridge Aid provides advanced situational awareness, path planning and navigation in complex contact situations.**

### **TECHNOLOGY**

ASView Bridge Aid features a highly intuitive user interface to monitor the ship's environment through active and passive perception sensors and to display ownship health and performance information. The Bridge Aid provides advanced situational awareness and path planning to reduce the Officer of the Deck (OOD) and navigation team's cognitive load in complex contact situations.

L3Harris can equip seafarers with existing autonomy solutions to augment their skillsets, improve efficiency and assist in avoiding collisions. The same hardware components and software elements that provide situational awareness and navigation safety on over 125 unmanned vessels and optionally manned conversions can be applied to assist a ships' crew and enhance the overall safety and efficiency of manned operations.

### **SOFTWARE**

At the core of all our unmanned surface vehicles(USVs) and unmanned conversions is our ASView control software. Path planning begins with perception data from camera feeds, radar, AIS, lidar, sonars, depth sounders, navigational chart overlays, and other sensors. ASView fuses all of this inbound perception data together, while taking the accuracy of each device into consideration, to develop a complete and accurate view of the vessel's surroundings.

This fused data is then used to identify and classify contacts according to their characteristics. The data determines the current location of these contacts and can predict where these contacts will be over various time horizons based on the continuous collection of historical data.

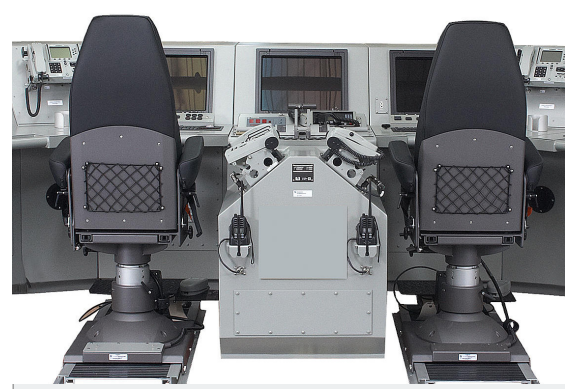
The ASView Bridge Aid then uses this information to determine all of the possible routes available to complete its mission objective, evaluate and score each based on a desired set of behaviors and generates a deliberative plan containing a set of feasible maneuvers that the OOD can perform under the current operating constraints to achieve the desired objectives in a COLREGS-compliant manner.

A customizable set of behaviors used to evaluate the available routes can include avoiding grounding and collisions, minimize fuel consumption or make rapid path adjustments. The software was designed to be extremely modular so that new behaviors can easily be added to the evaluation process.

With a multi-contact COLREGs deconfliction capability and true look-ahead view, the ASView Bridge Aid provides a clear visual presentation of the current situation and alerts to direct the operator's attention to important contacts or when the current path deviates from the recommended path.

ASView is miles ahead of the competition regarding its capabilities, functionality, modularity, and intuitive layout. Each node of our system uses well-defined, well-documented interfaces related to its specific function, enabling the customer to swap out components without any other changes.

ASView is designed from the ground up with a Modular Open Systems Approach, which provides value and flexibility to the customer through the ease of integrating additional, sensors, behaviors and applications such as ASView Bridge Aid.



### **- DETAILS**

- The ASView Bridge Aid uses an existing intelligent analysis engine developed for autonomous surface vessels and can be tailored to suit operator requirements.
- The scope of the Bridge Aid includes our ASView software, a server rack, and one or multiple monitors on the bridge. It can use many existing perception sensors and inputs from existing ECDIS.
- Interfaces are available for GPS receivers, gyro-stabilized and satellite compasses, inertial navigation systems, marine radar systems, AIS, electro-optical and thermal cameras, depth sounders and MET/ environmental sensing.
- The ASView Bridge Aid User Interface has clear navigational data displays, full S57 electronic navigation charts with AIS and radar overlay, dedicated radar display and 360° fixed and stabilized pan, tilt and zoom EO/IR camera displays.
- ASView Bridge runs on a Linux operating system and uses rugged laptops, desktop or rack computing hardware. The user interface can be used with a single 1920x1080 display, but two displays are optimal for continuous operations.

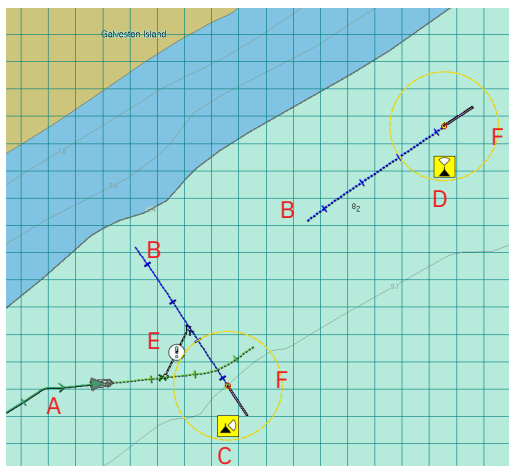


Figure 1 -ASView “Look Ahead” View Data Display

- A Green Path – Suggested path look ahead view
- B Blue Path(s) – Predicted contact motion
- C Bottom – Classified crossing give way indicator
- D Right – Classified head-on indicator
- E Exclamation – Closest Point of Approach (CPA)
- F Yellow Circle(s) – Risk radius



Figure 2 -Image (video) based obstacle tracking and classification

### ASVIEW BRIDGE AID

- > ASView Bridge Aid features a cutting edge COLREGS-compliant collision regulation avoidance capability developed for autonomous surface vessels to significantly reduce the captains load during collision avoidance maneuvers.
- > The Bridge Aid is to be used as an independent COLREGS decision-making reference in normal to challenging vessel traffic situations for manned vessels.
- > Provides an intelligent user interface to reduce the operator’s cognitive load by highlighting important information rather than presenting the raw data.
- > Assists operators with safe COLREGS navigation in the presence of other vessels.
- > Directs the operator’s attention to important items using audible alerts and clear visual presentation of important data based on the current situation.
- > Uses an existing intelligent analysis engine developed for autonomous surface vehicles.
- > The collision avoidance system can understand and fully autonomously respond in accordance with COLREGS to address:
  - Individual COLREGs 11 and 13-19 – head-on, crossing from the port, crossing from starboard, overtaking and being overtaken.
  - Situations with multiple vessels that are compounds of above.
  - Uses the meta-data broadcast by AIS to respond appropriately to vessel types, e.g. giving way to large tankers, sailing boats or always keeping clear of dredgers.
  - Traffic is expected to obey COLREGs though the system will avoid collisions with contacts that violate COLREGs.