



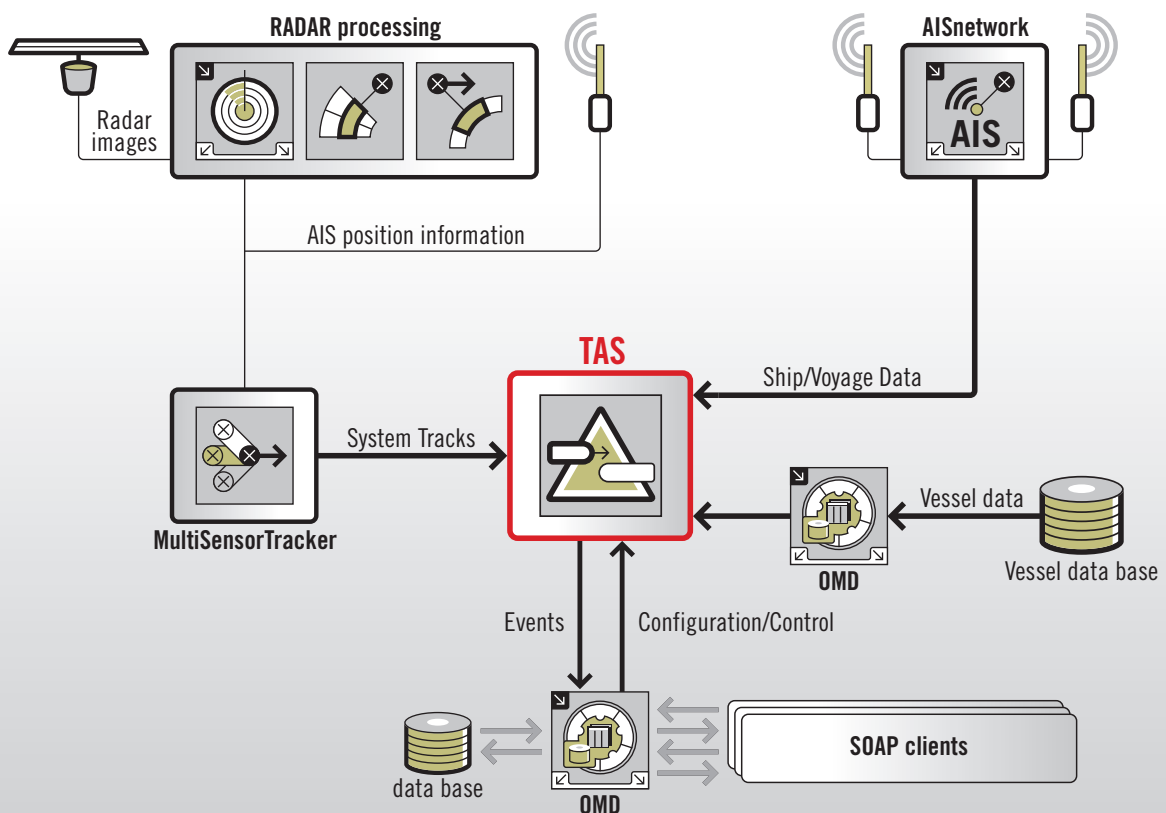
detects traffic conflicts

TAS *Traffic Analysis System*

TAS is a powerful rule based software component used in Vessel Traffic Surveillance to detect potential dangerous situations and monitor ships to adhere to traffic regulations for safe and secure traffic. It is successfully in operation for traffic monitoring, offshore wind farm surveillance, as well as for border security or sovereign tasks. The software applies user defined traffic rules on real-time traffic situations integrating the prediction of the movement of tracks and, thereby, provides so called traffic events. **TAS** detects reliably conflict situation and all traffic rule infringements, such as specific vessels entering a prohibited or restricted area or violating speed limitations. Crossing lines, leaving routes or heading to the wrong direction may generate alerts. Furthermore,

thresholds defined for CPA/TCPA events evoke reports of encounters in special areas. Vessel behavior and data such as dangerous load or ship dimensions can be part of the rules. **TAS** classifies those rules as geographic topologies (areas, routes or lines) combined with a set of attributes. Rules may be modified by supervisor any time to adapt to local operating procedures. In case of rule infringements, **TAS** will generate and update accordingly the appropriate traffic events and makes the information available to other components of the system. Alarms of different severity levels depending on the traffic event have to be acknowledged by the operating officers. **TAS** is the crucial component for reliable warning and collision avoidance in traffic surveillance and security.

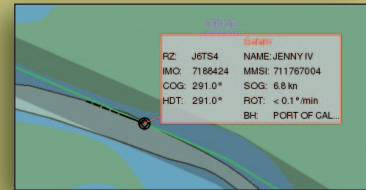
Sample configuration of TAS



A product of innovative navigation

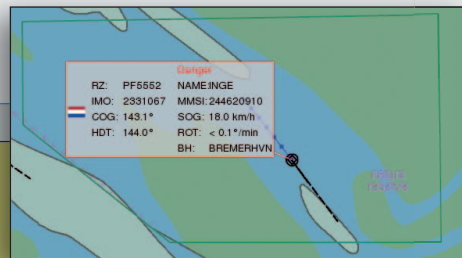
Visualization of TAS output

Active	Acknowledge State	Severity	Description	Affected Topology	CPA Distance	CPA Time	Detection time
Active	Acknowledged	Danger	CPA/TCPA crossing	CPA-TCPA Area	64.0 m	2 min 46 s	10.06.2013 12:20:59
Active	Acknowledged	Danger	CPA/TCPA crossing	CPA-TCPA Area	490.0 m	1 min	10.06.2013 12:20:59
Active	Acknowledged	Danger	Track inside area	Nature Reserve			10.06.2013 12:18:18
Active	Unacknowledged	Danger	CPA/TCPA crossing	CPA-TCPA Area North	366.0 m	7 min 46 s	10.06.2013 12:24:46
Active	Unacknowledged	Danger	CPA/TCPA crossing	CPA-TCPA Area	443.0 m	48 s	10.06.2013 12:20:59
Active	Unacknowledged	Danger	Track inside area	Nature Reserve			10.06.2013 12:18:18
Inactive	Unacknowledged	Danger	Track inside area	Nature Reserve			10.06.2013 12:18:22
Inactive	Unacknowledged	Danger	CPA/TCPA crossing	CPA-TCPA Area			10.06.2013 12:17:33
Inactive	Unacknowledged	Caution	CPA/TCPA crossing	CPA-TCPA Area North			10.06.2013 12:06:51
Inactive	Unacknowledged	Caution	CPA/TCPA crossing	CPA-TCPA Area North			10.06.2013 12:06:29
Inactive	Unacknowledged	Danger	Track inside area	Nature Reserve			10.06.2013 12:00:42

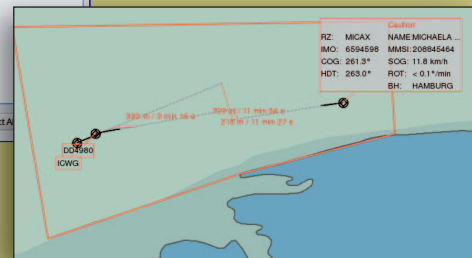


TAS allows defining required vessel behavior along routes

A traffic event list visualizes the output of TAS



Visual warning by TAS when vessel entered a predefined topology



CPA (Closest point of Approach) is a traffic event output of TAS

Highlights

- Graphical edition (via inDTS) to define geographic areas, lines and routes combined with the according rules
- Modeling of common traffic management topologies as warning areas, guard lines or separation schemes
- traffic rules combining geographical areas and ship attributes
- Flexible rule editor allowing the operator to change rules during runtime
- Processing of enhanced traffic attributes from radar and AIS sources
- Area conflicts for entering or leaving the warning area
- CPA/TCPA for overhauling, crossing and encounter
- Definition of prewarning times and life time
- List of all current traffic events immediately available on a GUI
- History of traffic event changes and acknowledgement of alarms
- Processing ASTERIX track data and integration of AIS via RS232 or TCP/IP
- Platform independent (LINUX, Windows™)



Further information about recent developments of innovative navigation systems can be found on the homepage: <http://www.innovative-navigation.de>

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