

AIS Virtual Aids to Navigation

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vespermarine

What is a Virtual Aid to Navigation?



Synthetic

Symbols appear
on vessel
navigation
equipment in the
charted location



Virtual



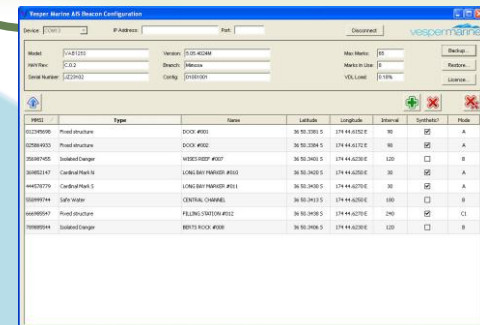
- ☐ ECDIS
- ☐ Chart plotter
- ☐ Radar
- ☐ AIS MKD
- ☐ AIS Display
- ☐ Computer



Aids to
Navigation
messages
transmitted
from shore

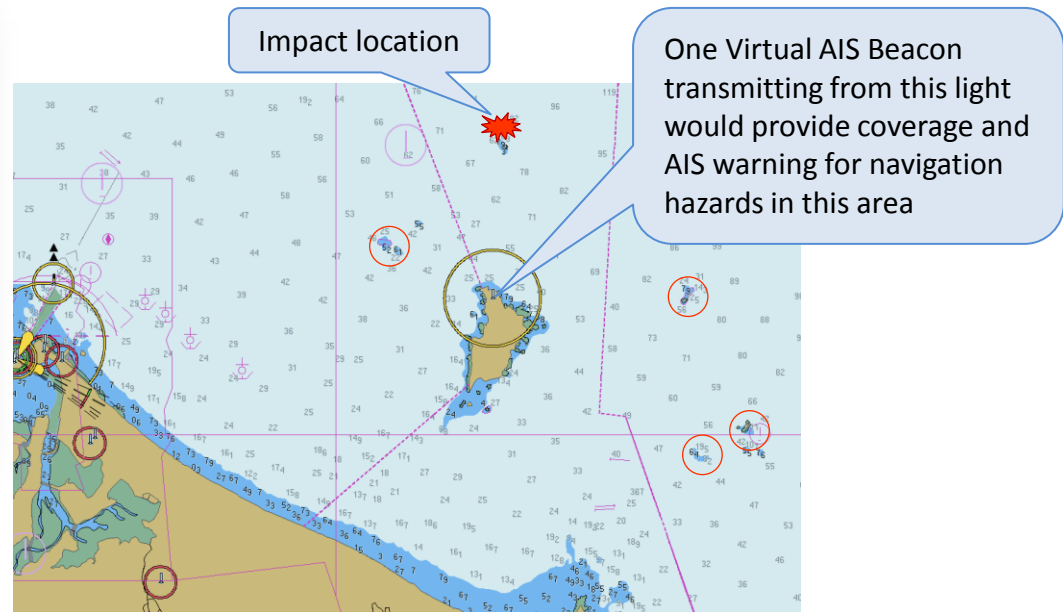


Shore
Station



MMSI	Type	Name	Latitude	Longitude	Altitude	Symbol	Mode
100000000	Fixed structure	DOCK #1001	50 50.0000 S	174 44.0000 E	0	A	A
100000000	Fixed structure	DOCK #1002	50 50.0000 S	174 44.0000 E	0	A	A
100000000	Isolated danger	WEDGEMOUNT #1007	50 50.0000 S	174 44.0000 E	100	B	B
100000000	Cardinal Mark S	LONG BAY PASSAGE #1010	50 50.0000 S	174 44.0000 E	0	A	A
100000000	Cardinal Mark S	LONG BAY PASSAGE #1011	50 50.0000 S	174 44.0000 E	0	A	A
100000000	Safe water	CENTRAL CHANNEL	50 50.0000 S	174 44.0000 E	0	B	B
100000000	Fixed structure	PELLENS POINT #1012	50 50.0000 S	174 44.0000 E	0	A	A
100000000	Isolated danger	WEDGEMOUNT #1008	50 50.0000 S	174 44.0000 E	100	B	B

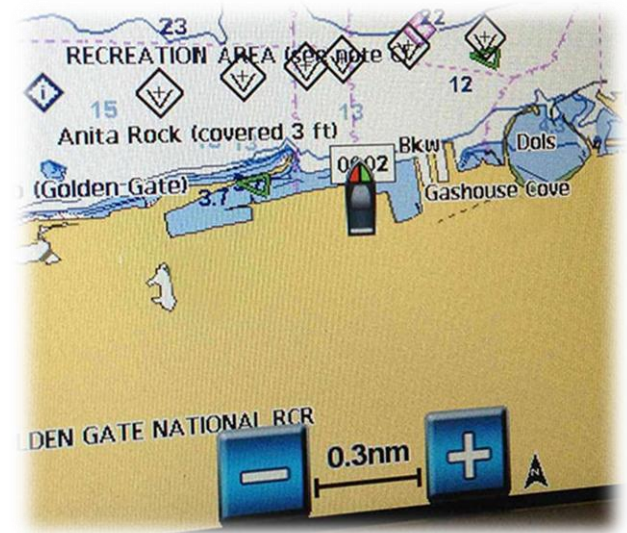
Why Virtual Aids to Navigation?



- ❑ Where physical aids are impractical
- ❑ Temporary locations
- ❑ Easy to “move”
- ❑ Can trigger a collision warning alarm
- ❑ Low maintenance
- ❑ Increased range



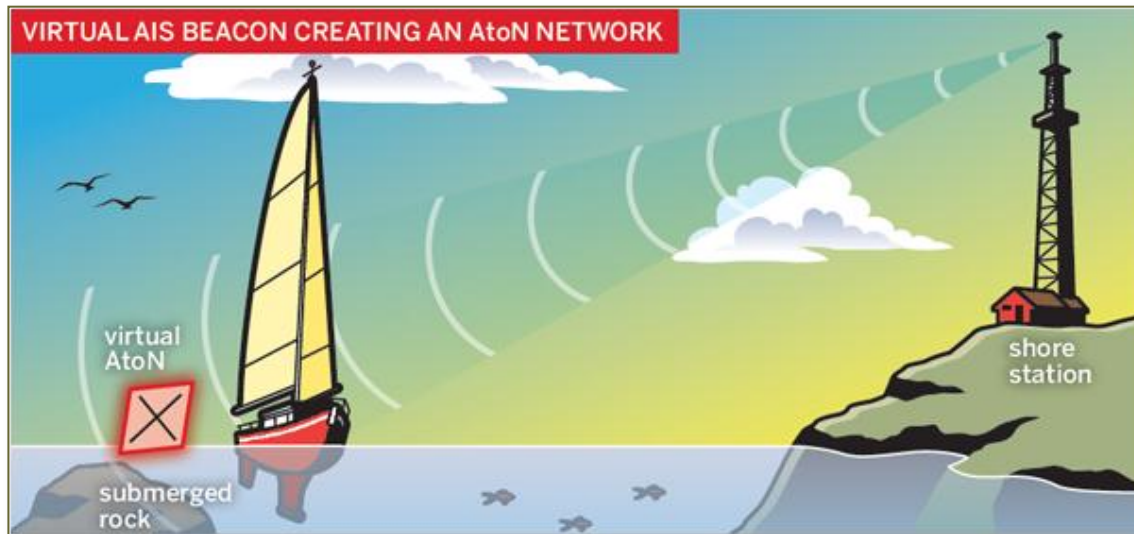
Limitations



- ☐ Vessels need AIS to see them
- ☐ Virtual may not suit “eyeball navigation”
- ☐ Floating aids can’t set the off position indicator



How does it work?

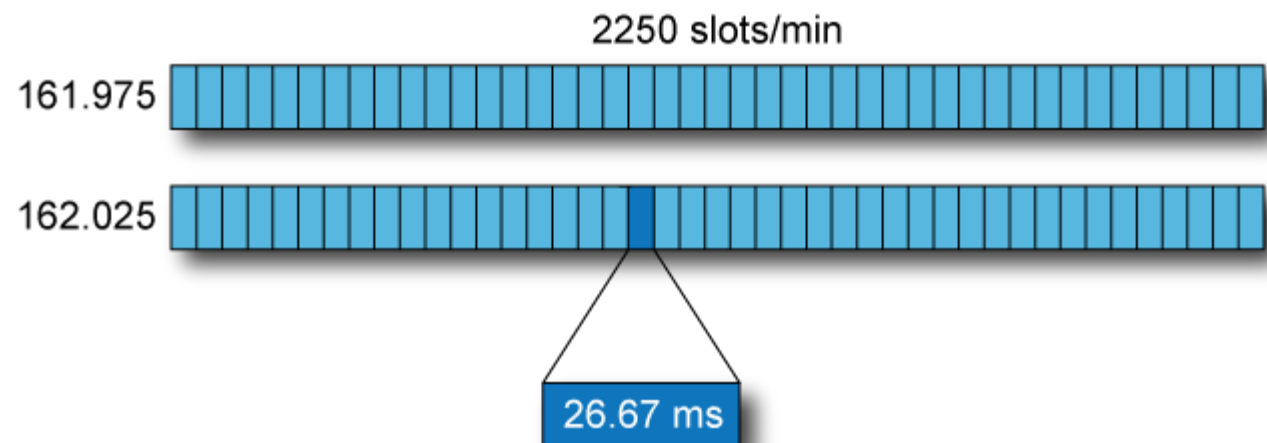


AIS Station Types:

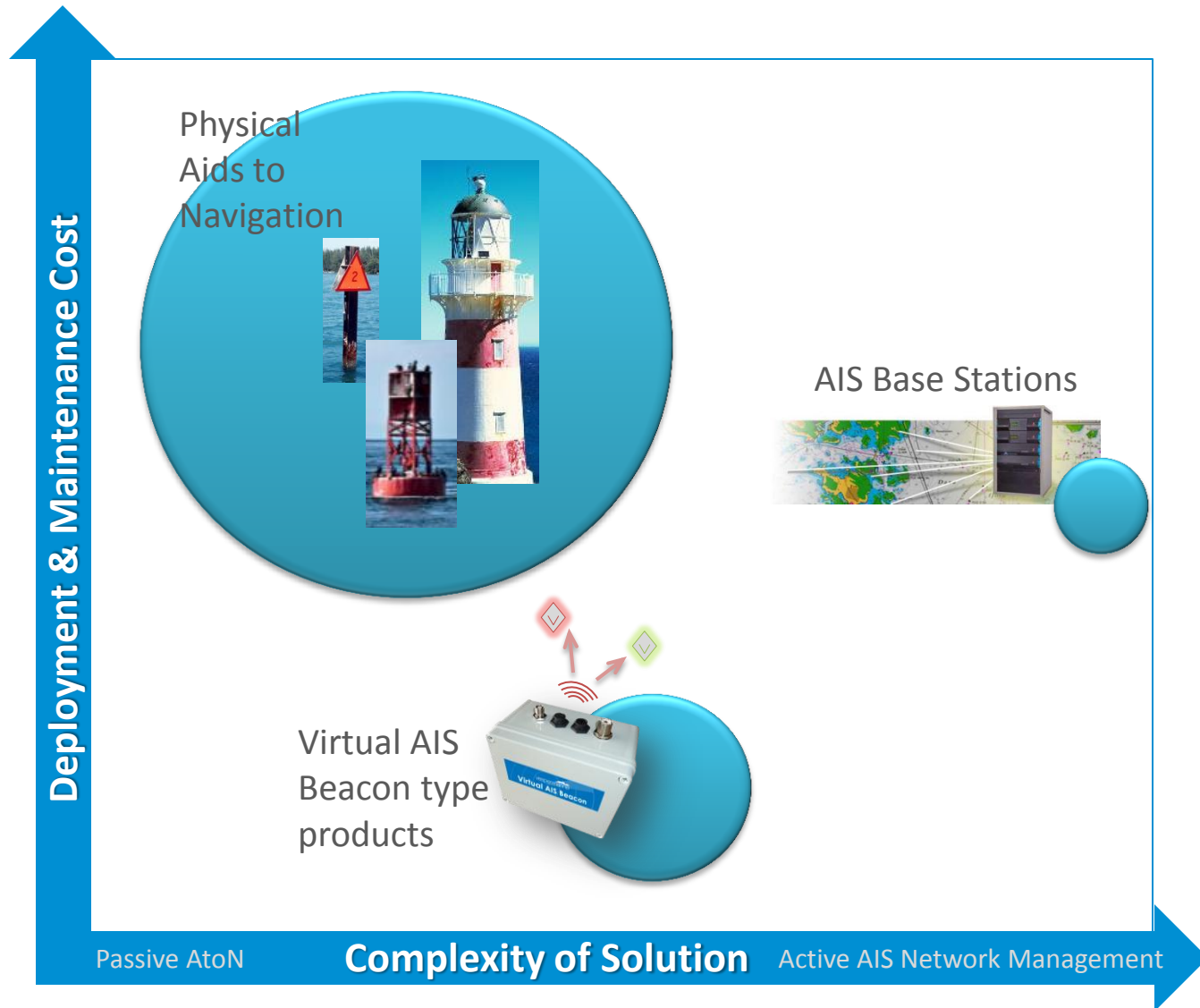
- ☐ Class A
- ☐ Class B
- ☐ SAR
- ☐ SART / MOB
- ☒ AtoN

AIS Access schemes:

- ☐ SOTDMA
- ☐ CSTDMA
- ☒ FATDMA
- ☒ RATDMA



Where Does Virtual AIS Fit?

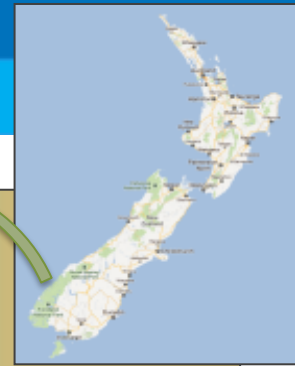
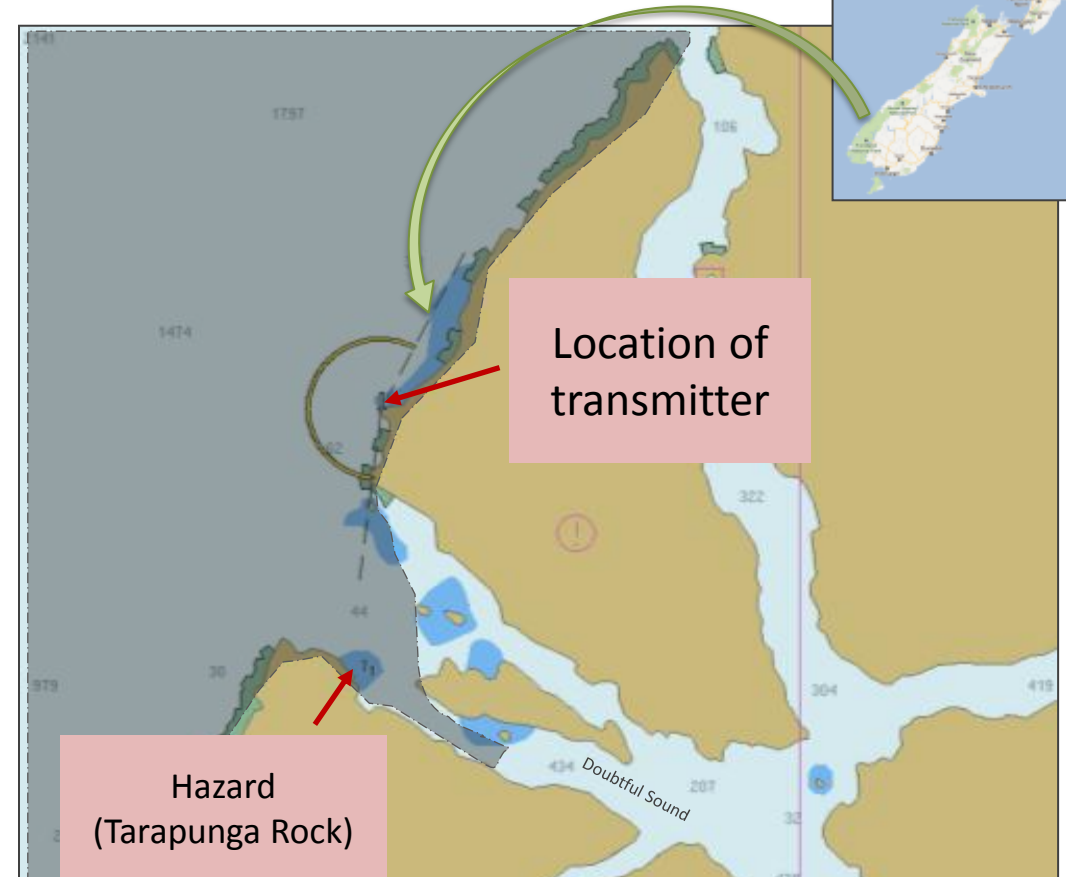


Case Study – Isolated Danger

Tarapunga Rock, Doubtful Sound, New Zealand



- ☐ Remote and isolated region
- ☐ Pristine wilderness
- ☐ Floating aid failed due to extreme conditions
- ☐ Frequent cruise ships in summer
- ☐ No shore facilities
- ☐ Limited maintenance ability

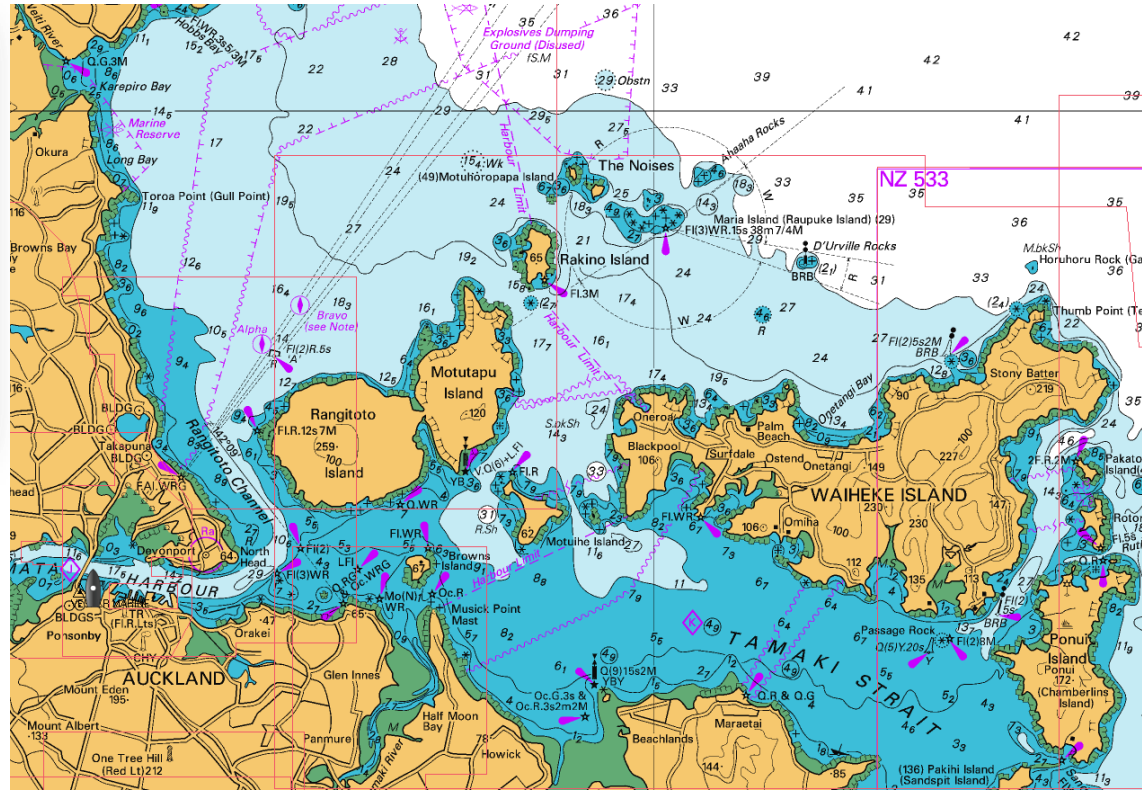
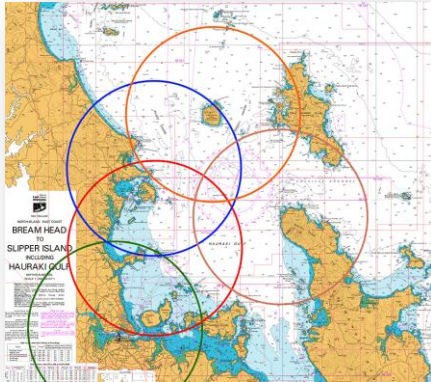


Case Study – Moveable Shipping Lanes

Port of Auckland, New Zealand



- ❑ To avoid whales ships are requested to slow down
- ❑ Results in late arrivals and increased shipping costs

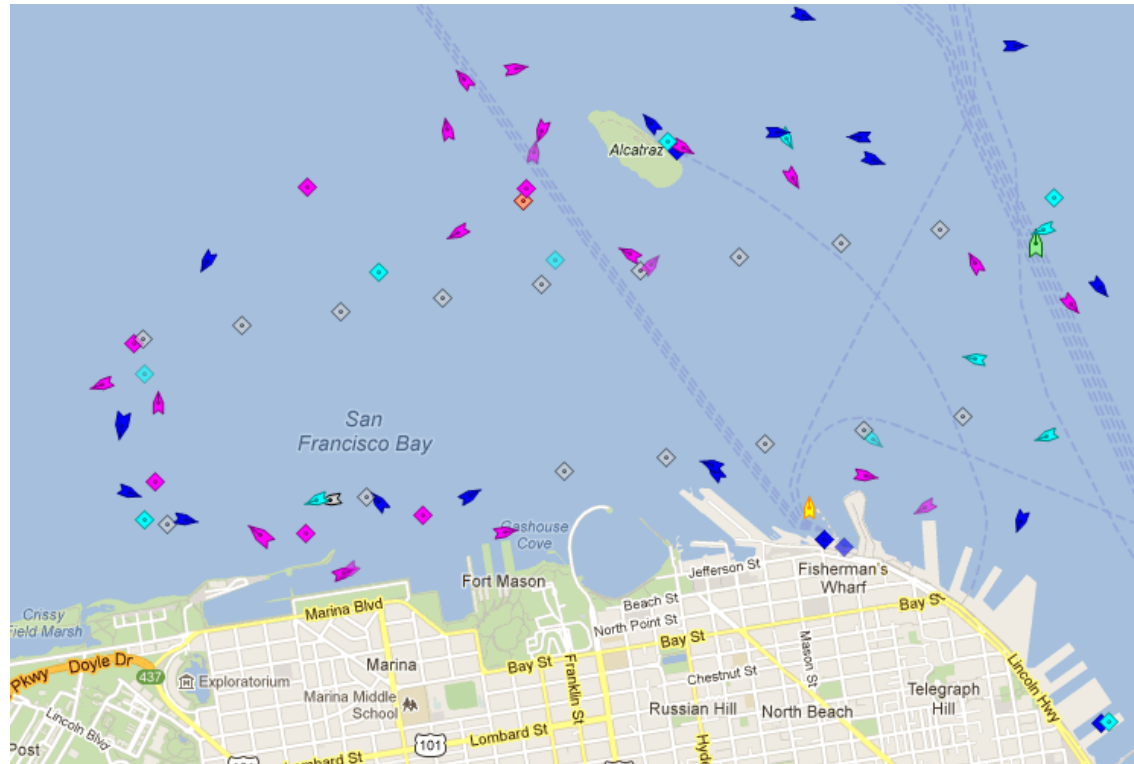


- ❑ Virtual buoys create moveable shipping lanes
- ❑ Network of “beacons” increases range

Case Study – Event Mangement

America's Cup – San Francisco

- ☐ Spectator fleet must be kept outside course boundary
- ☐ Course marshal on-the-water determines marks
- ☐ Transmitted to shore via private secure network
- ☐ Course boundaries computed
- ☐ Transmitted via TCP/IP link to virtual AIS beacon
- ☐ Beacon immediately begins transmitting boundary “special marks”



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Thank You

