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Recent modifications and upgrade projects within the AMSA network

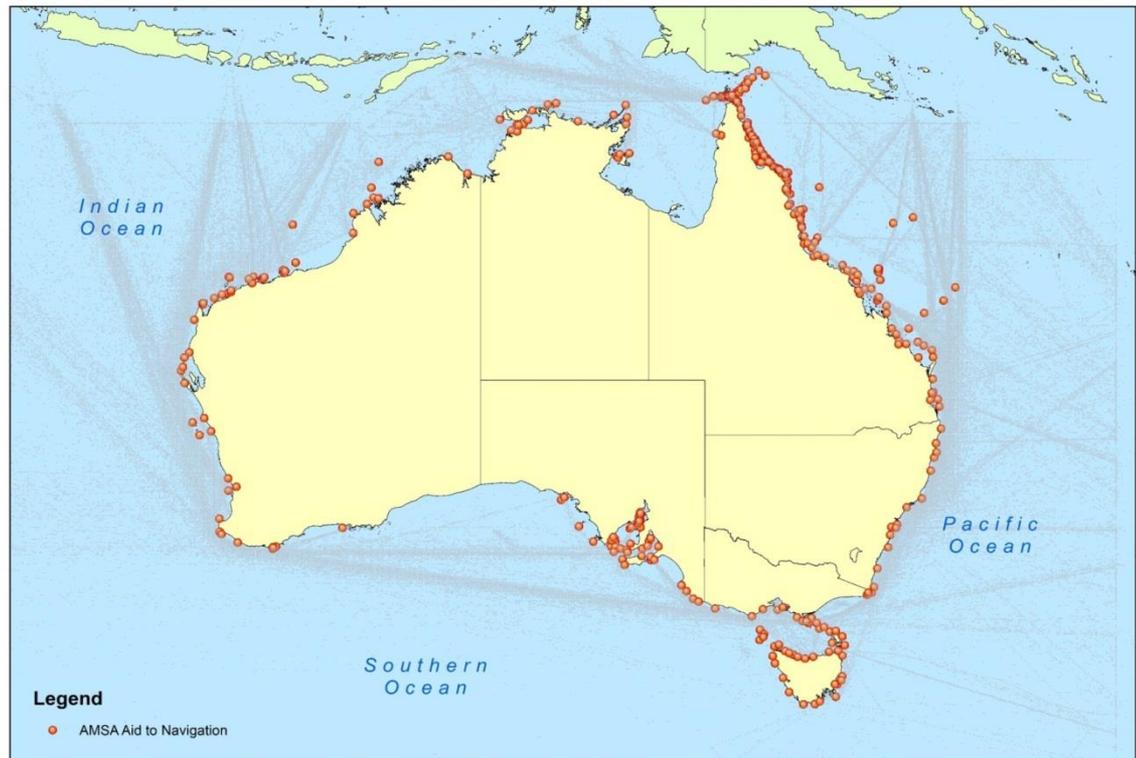
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Location of AMSA's AtoN sites

- ▶ AMSA currently manages a network of 492 AtoN at 381 AtoN Sites.
- ▶ Traditional lighthouses
- ▶ Beacons
- ▶ Buoys
- ▶ RACON's
- ▶ Differential Global Positioning System (DGPS)
- ▶ Automatic Identification System (AIS) stations
- ▶ VTS Radars
- ▶ Met ocean Sensors





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- ▶ AMSA AtoN network is remote
- ▶ Logistics can be a large contributor to project costs
- ▶ With remoteness and large areas to cover reliability of equipment and structure durability is essential





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Modernisation and upgrade projects:

- ▶ Major concrete repairs
- ▶ Major repainting projects (including removal of lead paints)
- ▶ Replacement of incandescent lights with LED's, (sectored and non-sectored).
- ▶ New remote monitoring system.
- ▶ AIS network upgrade.
- ▶ Major rotating lights with LED's.
- ▶ Replacing steel buoys with polyethylene.
- ▶ Modification of structures to also support AIS and VHF radio comms.



Case studies



1. Structure modifications



2. Lighthouse concrete repairs



3. Major repaint projects

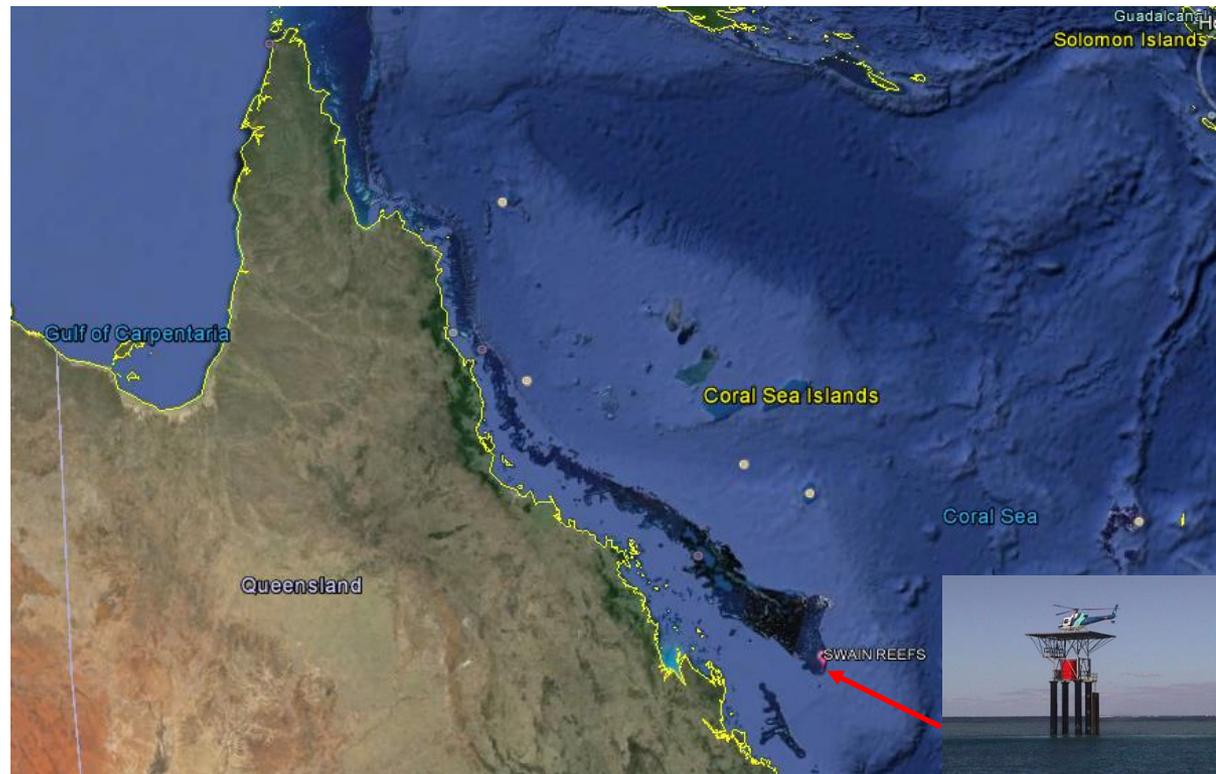


4. Replacing steel buoys with polyethylene



Case study 1 – Structure modification

- ▶ Swain Reefs AtoN structure
- ▶ 130nm from the mainland coast
- ▶ Constructed in 1999
- ▶ Helipad damaged by a cyclone and removed in 2010
- ▶ Height increased in 2014





Case study 1 – Structure modification

▶ Design brief

- ▶ AIS coverage
- ▶ VHF radio comms
- ▶ AIS and Radio data via Satellite link back the mainland



Existing structure

▶ Phase 1 – structural review to use existing piles.

- ▶ Support a higher structure or new to be built
- ▶ Including the capacity to withstand cyclonic winds.



Concept structure modifications



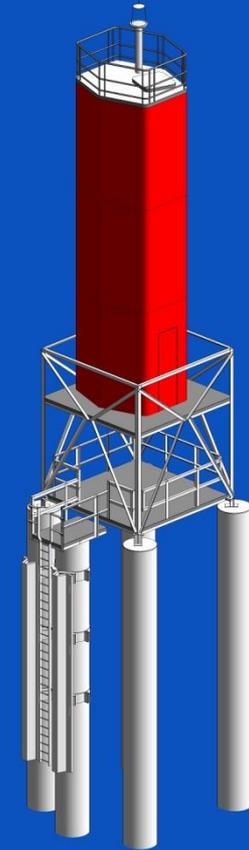
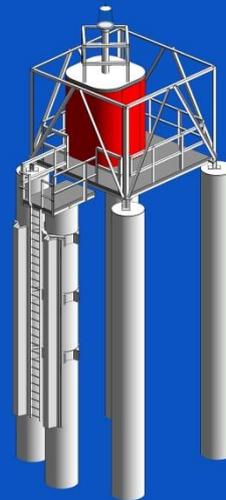
Case study 1 – Structure modification

▶ Concept design

- ▶ On existing piles a 3m stainless steel lattice framework section with a 3 module hex tower on top.

▶ Height extension

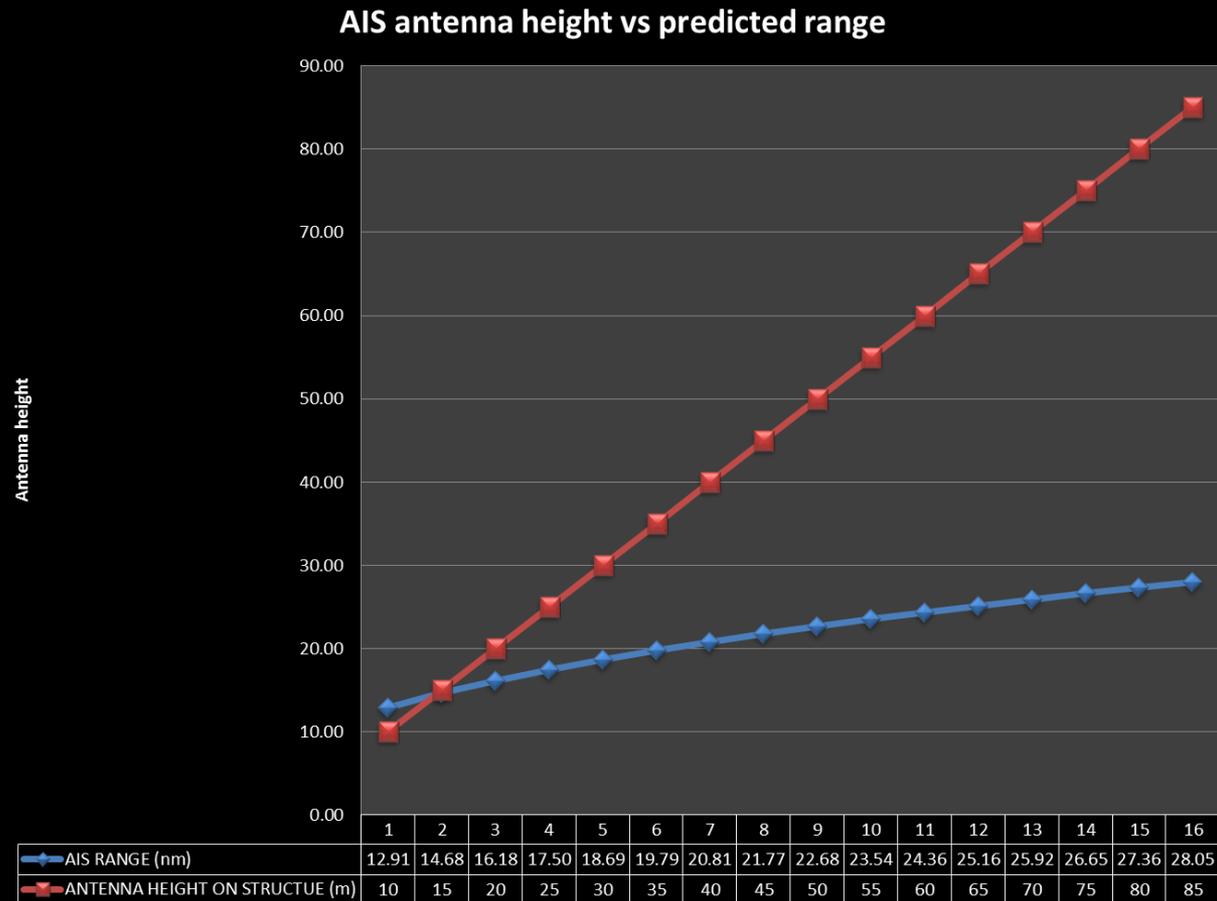
- ▶ 10m elevation (existing)
- ▶ Final height 20m





Case study 1 – Structure modifications

- ▶ Using IALA AIS range formula to predict range vs antenna height





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Case study 1 – Structure modifications





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Case study 1 – Structure modifications





Case study 2 – Lighthouse concrete repairs

- ▶ Cape Don Lighthouse
- ▶ Reinforced concrete built in 1916.
- ▶ Issues causing cracking and delamination included Alkali Silica Reaction (ASR), carbonation and Chloride contamination.

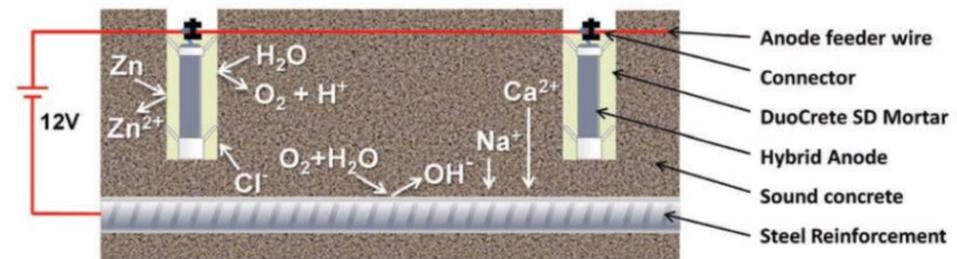




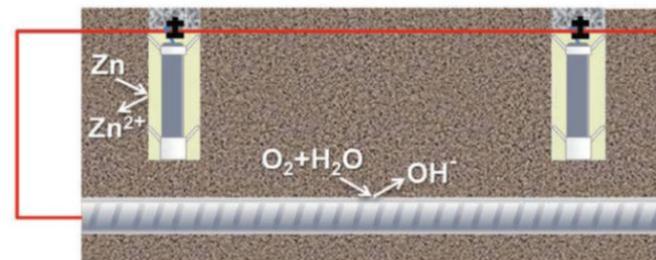
Case study 2 – Lighthouse concrete repairs

► Solution:

- Duoguard Hybrid Anode system with a fifty year design life.
- Phase 1 – short term (7 days) impressed current phase.
- Phase 2 – long term galvanic protection.



Short-term Impressed Current



Long-term Galvanic Current



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Case study 2 – Lighthouse concrete repairs





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Case study 3 – Major repaint projects Charles Point (1893) - Northern Territory





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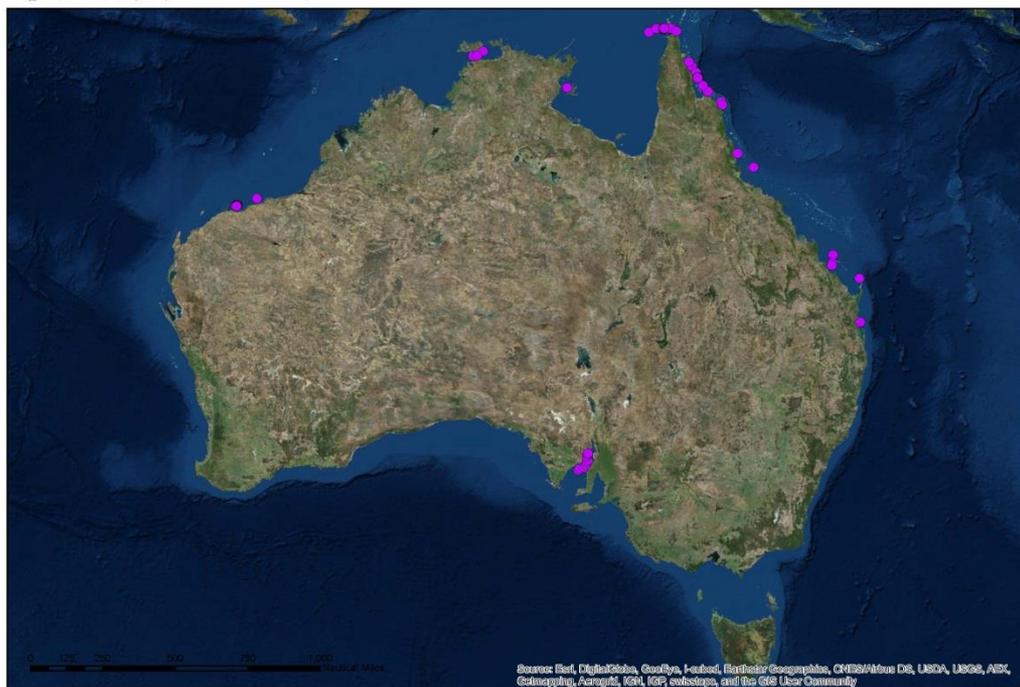
Case study 3 – Major repaint projects Double Island Point (1884) - Queensland





Case study 4 – Replacing steel buoys with polyethylene

- ▶ Buoy network
 - ▶ 63 ocean buoys
- ▶ Replacing all steel buoys with polyethylene
 - ▶ MOBILIS Jet 7000 with high vis towers
- ▶ Timeframe within 3 years





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Case study 4 – Replacing steel buoys with polyethylene





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Case study 4 – Replacing steel buoys with polyethylene





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Thankyou

