Inquiry into economic, social and environmental sustainability in the Indian Ocean Territories

Submission
on
Terms of Reference (ToR) Items:

- Encouraging innovation and investment that addresses sustainability challenges and provides economic opportunities. This could include innovative approaches to waste management, and capitalising on the unique environmental qualities that represent the marketing and strategic advantage of the Islands in the long term

- Strengthening and diversifying the IOT economies; and identifying future infrastructure needs to support sustainable economic growth;

Infrastructure considerations in economic, social and environmental sustainability in the Indian Ocean Territories

Air Power Australia Submission to the
Joint Standing Committee on the National Capital and External Territories

Recommendations:

1. Australia should without delay implement the infrastructure recommendations detailed by *Air Power Australia* in the 2017 submission to the *Inquiry into the Strategic importance of the Indian Ocean Territories* to address the extant and developing strategic situation in the Indo-Pacific region;
2. Australia should engage with interested players in the global space industry to understand what their expectations are in terms of infrastructure availability to support an operational spaceport located in Australia's Indian Ocean Territories;
3. Australia should conduct environmental impact studies for spaceport construction and sustained operation in the *Cocos (Keeling) Islands* and *Christmas Island*, to determine constraints that may apply should spaceport facilities be developed;
4. Australia should perform an economic impact study to determine the full range and scale of benefits to be gained from the space launch industry utilising the *Cocos (Keeling) Islands* and *Christmas Island* as locations for spaceports;

Recommendations from the 2017 JSCNCET APA Submission (4):

1. Australia should without delay construct a fully hardened AFH-32-1084 “heavy load” compliant 11,000 foot parallel runway military (dual use) airfield, Hardened Aircraft Shelters, and supporting fuel and munitions storage facilities on West Island in the Cocos (Keeling) Islands, capable of operating the full range of combat aircraft types operated by the Royal Australian Air Force, and United States Air Force;
2. Australia should without delay construct a fully hardened naval replenishment facility with a MIL-HDBK-1025/UFC compliant pier plumbed for POL, and capable of Roll-On Roll-Off transfers of vehicles and materiel, equipped with submarine sheds, in the area of Direction Island in the Cocos (Keeling) Islands, capable of supporting applicable Royal Australian Navy and United States Navy assets;
3. Australia should without delay redevelop the existing airfield on Christmas Island into a fully hardened AFH-32-1084 “heavy load” compliant 11,000 foot parallel runway military (dual use) airfield, with Hardened Aircraft Shelters, and supporting fuel and munitions storage facilities, capable of operating the full range of combat aircraft types operated by the Royal Australian Air Force, and United States Air Force;
4. Australia should without delay enhance Christmas Island port facilities to permit all season maritime resupply and replenishment capability for the redeveloped airfield;
5. All new and redeveloped facilities on the Cocos (Keeling) Islands and Christmas Island should be constructed with proper measures to protect the unique local environment, and utilised for environmental remediation, restoring where possible the original ecosystem;
6. Australia should without delay redevelop the existing RAAF airfields at Learmonth, Curtin and Tindal to provide fully hardened AFH-32-1084 “heavy load” compliant 11,000 foot parallel runway military (dual use) capability, Hardened Aircraft Shelters, and supporting fuel and munitions storage facilities;
7. Australia should without delay install hardened high delivery rate fuel replenishment infrastructure for the existing RAAF airfields at Learmonth, Curtin and Tindal;
8. Australia should without delay redevelop the Truscott-Mungalalu Airport to provide a 11,000 foot runway rated for the sustained operation of Airbus A330-200 and Boeing 767 size aircraft;
9. Australia should without delay install hardened personnel accommodation at extant RAAF airfields at Learmonth, Curtin and Tindal, and the proposed dual use facilities on the Cocos (Keeling) Islands and Christmas Island;
10. Australia should without delay invoke provisions in the ANZUS treaty and consult with the United States on the intent underpinning the proposed basing upgrades, and agree upon contingencies that would justify joint operations from these bases;
11. Australia should without delay consult with neighbouring nations to explain the intent underpinning the proposed basing upgrades, and their potential uses in supporting disaster relief operations across the region;
12. Australia should explore non-traditional options for contracting the proposed basing upgrades, including an independent entity to define, procure and manage the upgrades (modelled on infrastructure schemes like the NBN), or procuring via FMS (Foreign Military Sales) the services of United States government to perform specialist design and construction tasks, while utilising to best effect domestic construction industry capabilities.

Infrastructure considerations in economic, social and environmental sustainability in the Indian Ocean Territories

Australia's Indian Ocean Territories are of vital strategic importance to the nation and deserve significantly greater investment in their future if their full strategic potential is to be realised. Specifically, the *Cocos (Keeling) Islands* and *Christmas Island* by virtue of their critical geographical locations provide for strategic control of the geographical area connecting the Indian and Pacific Oceans.

Any considerations on the economic, social and environmental futures of these territories must recognise that these matters are inherently contingent upon Australia's ability to maintain sovereignty over these territories.

Australia should aim to avoid finding itself in the situation where its sovereignty over the *Cocos (Keeling) Islands* and *Christmas Island* is challenged by any other nation in the wider region. The sorry predicament of the Philippines, who are now seeing their sovereignty over the Spratly Islands being challenged by China, is an outcome Australia should actively seek to avoid[1].

The economic, social and environmental futures of these territories are thus inextricably intertwined with Australia's ability to defend and demonstrate its sovereignty over these territories - investment in building credible infrastructure to support a modern economy in these territories is a prerequisite for both, while demonstrating both commitment and sovereignty[2].

The earlier inquiry by this committee dealing with the *Strategic importance of the Indian Ocean Territories* resulted in a vigorous debate and a consensus that the *Cocos (Keeling) Islands* and *Christmas Island* were indeed vital strategic assets. *Air Power Australia* contributed to this inquiry, and the recommendations made in our submission (above), and the charts in that submission are included (Annex A)[3]. The evidence provided was drawn in a large part from a research study *Air Power Australia* published in early 2012[4].

In the years following that inquiry strategic circumstances have become more challenging, with the strategic competition across the wider region not only validating the conclusions of the 2012 study, but also increasing the strategic payoff to be gained by Australia from addressing the conclusions with the specific recommendations made to this committee four years ago[5].

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[1] Refer *220 Chinese Vessels Stake Out Another Reef in Spratly Islands*, Maritime Executive, 21st March 2021, URI: https://www.maritime-executive.com/article/220-chinese-vessels-stake-out-another-reef-in-spratly-islands - China is also challenging the sovereignty of other South China Sea territories, and portions of the Ryukyu Island chain that have long been accepted to be part of Japan.

[2] Notably, an argument frequently raised in disputes over sovereignty is that the nation being challenged has failed to develop the disputed territory and thus the interests of the disputed territory would be better served by the challenging nation.

[3] ***Enhancing ADF Basing Infrastructure in the Defence of Australia's Indian Ocean Approaches***, Submission 4, January 2017, URI:https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/National_Capital_and_External_Territories/StrategicImportanceIOT/Submissions

[4] ***Basing Infrastructure Considerations in the Defence of Australia's Indian Ocean Approaches***, APA Analyses Paper APA-2012-01, February, 2012, URI: http://www.ausairpower.net/APA-2012-01.html, Mirror URI: http://pandora.nla.gov.au/pan/46210/20150402-0813/www.ausairpower.net/APA-2012-01.html

[5] Consecutive governments have failed to address these matters, cite (Submission4, 2017): *"The Australian Defence Force Posture Review (ADFPR) of 2012 did not fully address Australia's developing strategic needs, and fell short in a number of areas. Of particular concern is that the proposed enhancement of RAAF airfields was constrained to aircraft significantly*

Maintaining a robust and sustainable economy in the *Cocos (Keeling) Islands* and *Christmas* Island will require basic infrastructure capable of supporting economic activity sufficient to maintain much of the population. As proposed in 2012, making this infrastructure "dual use" and thus available in contingencies for use by the ADF allows the taxpayer to benefit from the investment in such infrastructure continuously, rather than only in a crisis situation when used by the ADF, aside from other intangible benefits such as deterrent effect and strategic messaging to allies and potential opponents.

A key argument in the 2012 study was that robust basing infrastructure compatible with operating both air power and maritime assets was inherently compatible with high value economic activities in both the *Cocos (Keeling) Islands* and *Christmas Island*. Eco-tourism was identified very specifically as a valuable basis for the economies of both areas.

The 2012 study observed of the *Cocos (Keeling) Islands*: *"A port capable of berthing cruise ships, and an airfield compatible with long range airliners, provide a critical enabler for eco-tourism, offsetting some infrastructure costs over the longer term. Environmental considerations are discussed below."*

The 2012 study observed of *Christmas Island: "Christmas Island was the intended location for the construction of a major spaceport, with a launch facility at the island's South Point, to be operated by Asia Pacific Space Centre (ASPC) Pty Ltd. It was intended that a major airfield upgrade be performed to support the spaceport. The proposal did not eventuate, it appears due to undercapitalisation. The location is suitable for launches into both equatorial and polar orbits. The development of a major airfield compatible with 747-400 and A380 airliners would be a critical enabler for the local tourist industry, offsetting infrastructure costs over the longer term. A detailed study covering a runway upgrade to 8,700 ft (2.65 km) length, with an improved surface to accommodate heavy Boeing 747 and Antonov 124-100 aircraft, was performed by the Department of Transport and Regional Services in 2001, the intent being to provide the capability to support the proposed spaceport."*

Eco-tourism will remain over the longer term a viable economic activity both for the *Cocos (Keeling) Islands* and *Christmas Island*, regardless of the current crisis in this sector resulting from the COVID-19 pandemic. However, significant investment and resulting revenue from eco-tourism will only arise if good airfields capable of accommodating long haul airliners, and suitable maritime replenishment infrastructure for aviation fuel are constructed.

The expectation that significant growth in the eco-tourism sector can arise without prior transportation infrastructure investment is simply wishful thinking.

The proposal two decades ago to construct a spaceport on *Christmas Island* underscores the viability of both of these locations as potential space industry launch sites, by virtue of their proximity to the equator for launches into geo-stationary equatorial orbits, and also their remoteness, as debris from Expendable Launch Vehicles (ELV), and failed Reusable Launch Systems, can fall into open ocean areas.

A continuously operating space port benefits a local community as it will have to provide long term

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smaller than types operated by the United States, severely limiting the usefulness of these airfields in supporting any joint operations with the United States in an escalated wider regional contingency. Of no less concern is that the proposed hardening measures for airfields were very poorly defined, and failed to specify (cite) "the use of Hardened Aircraft Shelters and hardened bunkers for facilities, leaving the outcome open to interpretation." The ADFPR proposed only limited upgrades for the Cocos (Keeling) Islands airfield, and did not propose any enhancements to Christmas Island facilities."

accommodation, replenishment and recreation for hundreds of spaceport personnel.

The space industry is currently at a pivotal point in its evolution, as much more affordable Reusable Launch Systems are entering the market and are expected to eventually displace traditional Expendable Launch Vehicles. Examples include the *SpaceX* program led by Elon Musk, the *Blue Origin* program founded by Jeff Bezos, and *Virgin Galactic* founded by Richard Branson and Burt Rutan[6]. The former two employ reusable or partially reusable rocket boosters that fly back and land, the latter employs a large aircraft launched from a runway to lift an air launched space vehicle.

Global demand for satellite launches will not diminish, in fact the advent of Low Earth Orbit networking satellites intended to carry Internet traffic with reduced latency will see sustained growth in coming decades as new satellites are deployed, and replacement satellites launched to maintain services provided by expired satellites[7].

Notably, the advantages of equatorial locations for space launch sites apply regardless. Recent media reports indicate that Indonesia is proposing to SpaceX the use of Biak Island in Papua as a launch site, despite its proximity to populated landmass areas[8].

While Australia has both the *Cocos (Keeling) Islands* and *Christmas Island* located in geographically very advantageous areas to take advantage of future demand for space launch sites, neither would be attractive for private space industry investment without robust infrastructure investment as an enabler for a spaceport.

Specifically, an airport capable of accommodating heavy aircraft will be required for deliveries of hardware such as satellite vehicles, upper booster stages, and fragile ground support equipment, as well as personnel rotation. No less important is maritime berthing and loading infrastructure for the delivery of larger rocket booster equipment, liquid rocket propellants, and aviation fuel.

Aside from overly optimistic expectations of the satellite launch market of the period, a factor in the demise of the then proposed *Asia Pacific Space Centre (ASPC) Pty Ltd* Christmas Island spaceport may have been the cost of the required infrastructure investment, even though the Commonwealth had offered some support[9].

The expectation that private investors would wholly fund the necessary infrastructure investment to support a spaceport either located at the *Cocos (Keeling) Islands* or *Christmas Island* is much like the case of infrastructure required to support the eco-tourism industry, wishful thinking. Both industries operate on narrow profit margins and investors always prefer near term returns.

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[6] SpaceX URI: https://www.spacex.com/,
Blue Origin URI: http://blueorigin.com/,
Virgin Galactic: http://thespaceshipcompany.com/

[7] The SpaceX Starlink program is the first of these to deploy: https://www.starlink.com/ , also refer *SpaceX launches 143 satellites from a single rocket, including 10 stationed in polar orbit*, ABC News, 25 January 2021, URI: https://www.abc.net.au/news/2021-01-25/spacex-launches-143-satellites-from-falcon-9-rocket/13087758

[8] Refer *Indonesia courts SpaceX as new rocket launch site*, BBC News, 14 December 2020, URI: https://www.bbc.com/news/business-55297975

[9] A good analysis and critique of the ASPC project is Heyman J, A Tale Of Two Spaceports, *Satnews*, May 2011, URI: http://www.satmagazine.com/story.php?number=131406989

While new technology players in the space industry are one option, established players may also be an option. Canada's *Maritime Launch Services* are currently developing a proposal for a spaceport in Nova Scotia, Canada, using Ukrainian built *Cyclone 4* expendable launchers – Ukraine's space industry is actively seeking options that would decouple its industry from launch sites that are effectively under Russian control, such as the facilities in Kazakhstan[10]. *Cosmovision Global Corporation Pty Ltd* have recently advocated the construction of a spaceport on Cape York, with the intent to launch Ukrainian built *Zenit 3* expendable launchers[11].

In conclusion, what is abundantly clear is that the space industry is an attractive option outside of established industries such as tourism to provide a sustainable economic (and consequently social) foundation for both the Cocos (Keeling) Islands and Christmas Island, but no differently to the tourism industry, to attract investment funding the space industry will expect robust taxpayer investment in infrastructure and clearly defined environmental guidelines for project planning and costing.

[10] Refer Boucher M, Canadian Spaceport in Nova Scotia Gets Environment Ministry Approval to Move Forward, SpaceQ, 4 June 2019, URI: https://spaceq.ca/canadian-spaceport-in-nova-scotia-gets-environment-ministry-approval-to-move-forward/

[11] Refer *Cape York Space Port, Interview with Sam Davis, Producer*, ABC Radio Queensland Northern Drive On air – Drive time 4-6pm – Tuesday 13 October 2020, URI: http://cosmovisionglobal.com/press/ and Pivdenmash, Cyclone-4 launch vehicle, URI: https://yuzhmash.com/en/products/launch-vehicles/cyclone-4-launch-vehicle/, Zenit-3SL launch vehicle, URI: https://yuzhmash.com/en/products/launch-vehicles/zenit-3sl-launch-vehicle/

Annex A: Charts from the 2017 JSCNCET Submission

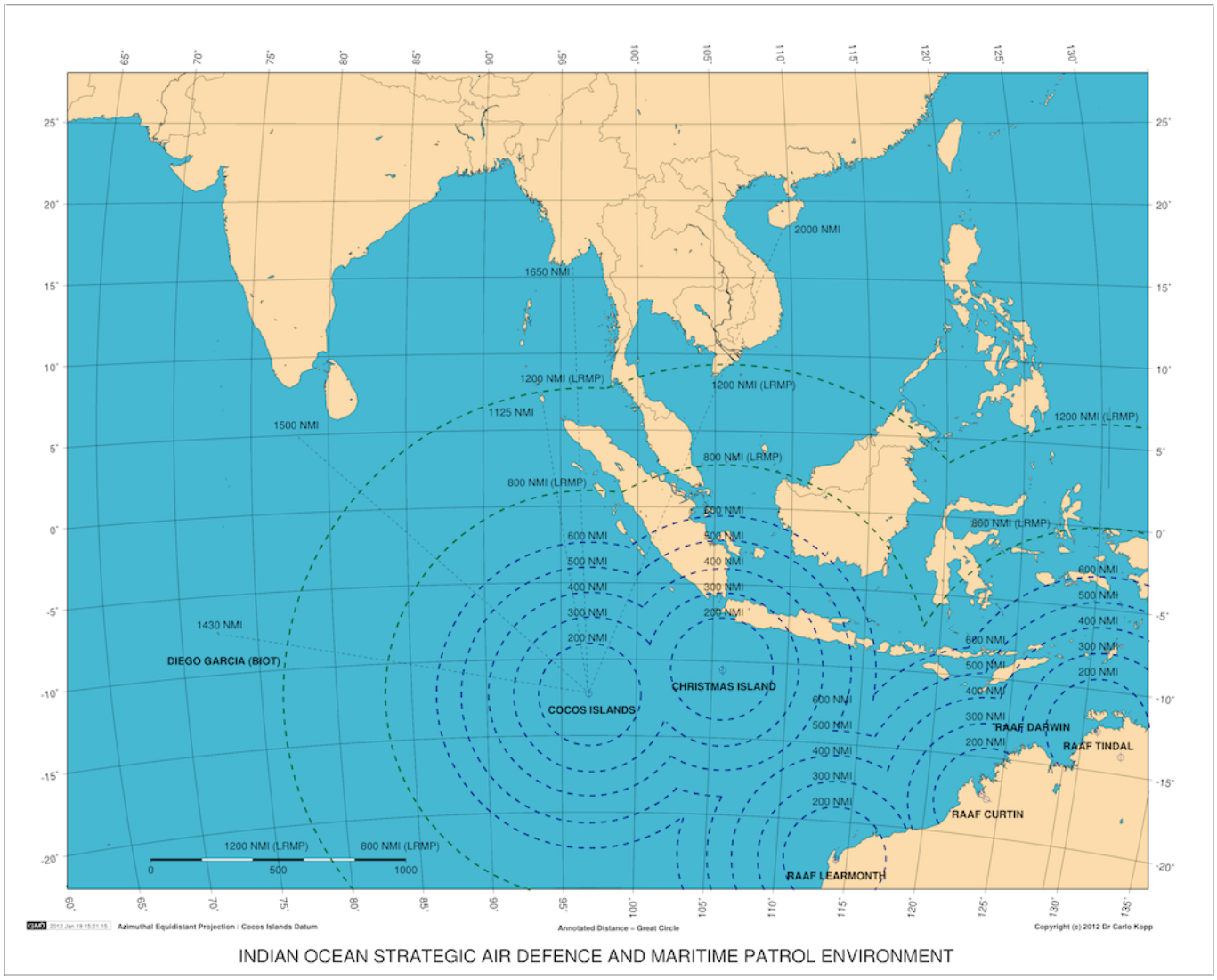

Figure 1: Air Defence and Maritime Patrol Coverage From Australian Sites (Air Power Australia, 2012).

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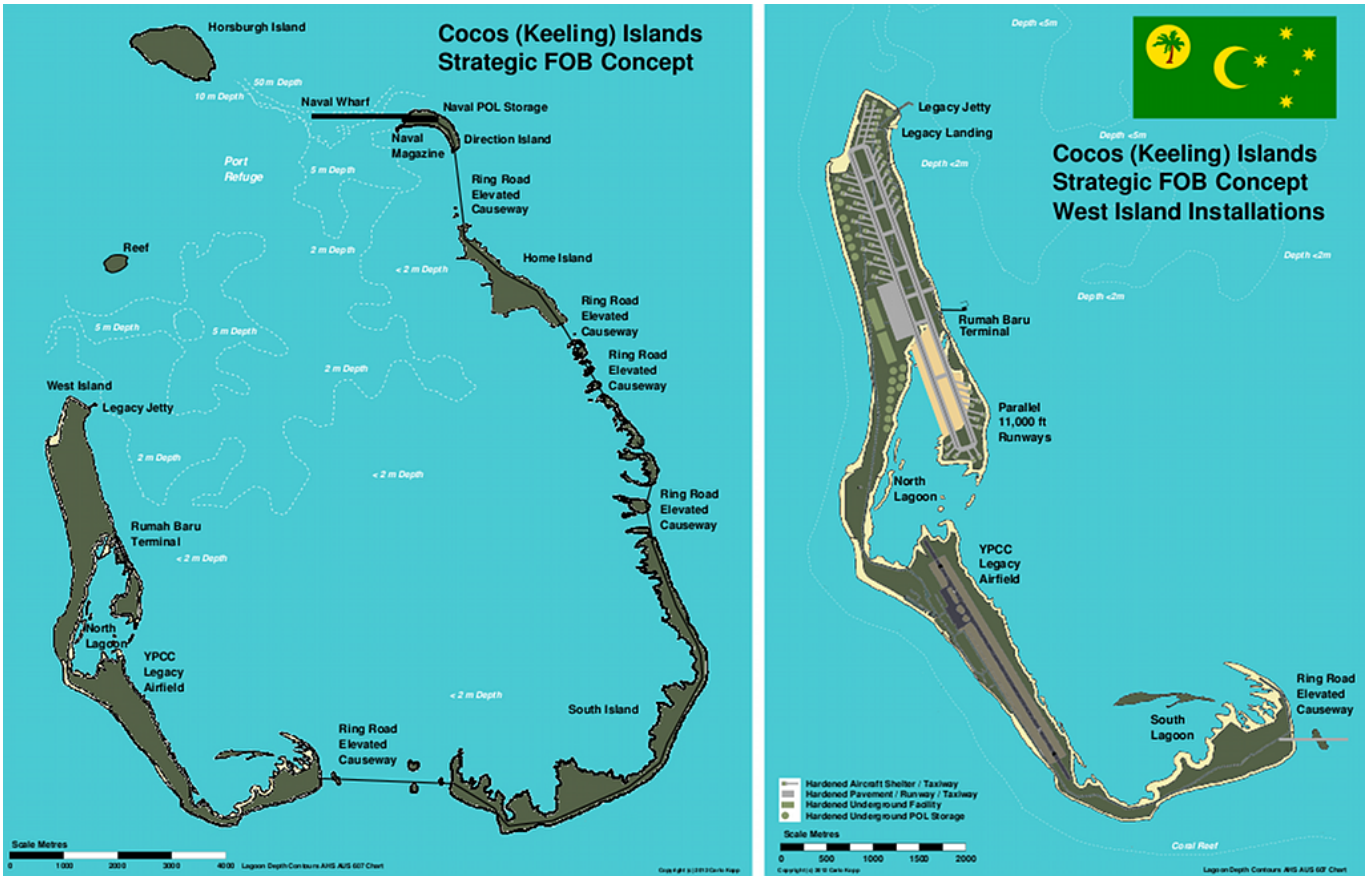

Figure 2: Cocos (Keeling) Islands Strategic Forward Operating Base Concept (Air Power Australia, 2012).

Figure 3: Great Circle Distances From Australian Sites (Air Power Australia, 2012).