

The Terrorism Threat on Warragamba Dam and Other Infrastructure from Building Western Sydney Airport

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7 August 2016

1. Current use of Infrastructure for terrorism

ISIS is currently using water Infrastructure as a terrorism weapon and tactic. The three major dams plus a fourth smaller one in Syria and Iraq are being used to threaten the lives of up to one million people in Bagdad by dam collapse and placing the people in Southern Iraq into drought by restricting the water supply (Isabel Coles, 2015, Kashmira Gander, 2015. Richard Sisk, 2015, Tobias von Lossow, 2016, RT, 2016). Evidence from the recent bombings in Brussels indicated that the group were surveilling and planning to use Nuclear Infrastructure as a weapon although the exact nature of this was unclear (Caroline Mortimer, 2016, Jennifer Newton, 2016).

Based on these reports the inference is:

- ISIS is well aware of the value of water and other infrastructure and their destructive powers on society.
- ISIS have assessed how to use the Infrastructure as a tactic:
 - Prisoners of high value are held at dams sites to prevent being killed in air strikes,
 - High profile leaders HQs are at dam sites as there is less risk of airstrikes,
 - Use of water restrictions to control the Iraqi population,
 - Threats of inundation of the population by blowing up the dam walls.
- ISIS are using a double strategy of terror on western countries:
 - Bombings and gun assaults in relatively low security situations
 - Pursuit of spectacular attacks involving protected infrastructure.
- In a broader context, terrorism groups in the future, as they have done in the past, will assess the potential of infrastructure for use as a target, as a tactic and as a weapon.

2. Playing into the hands of terrorists by building an Airport at Badgerys Creek

The citing of Western Sydney Airport at Badgerys Creek will play into the hands of terrorist organisations or hostile foreign governments under the guise of terrorism because it provides a mechanism by which Sydney's water and electrical infrastructure can be destroyed and the Australian Government may be incapable of preventing it from occurring.

Consider a terrorist attack on Warragamba dam and the current barriers that have been put in place to prevent such an occurrence. A ground attack involving persons in Australia is unlikely to succeed because the amount of explosive required to bring down the dam could not be sourced without some intelligence being generated on the theft of explosives that are required. This can be linked to criminal and terrorist activity within the country. Consequently, any plot is likely to be defeated.

An air attack, however, could be successful if a cargo plane comes from overseas and has sufficient size and momentum. A380's have this capacity and are becoming more common as international air freighters. Use of explosives as cargo increases the probability of success. Any prevention usually relies on intelligence through infiltration of the terrorist groups organising the attack. History shows such groups can go under the radar of intelligence organisations. Hostile Foreign Governments are also able to hide the development of an attack from intelligence surveillance that once carried out is then blamed on terrorism.

3. One of several scenarios

The scenario being discussed below is one of several scenarios that is capable of not being discovered until after the event has occurred or can occur from ordinary accidents on infrastructure.

Cleanskins (persons who have not been identified historically as being associated with terrorist groups) who are to act as pilot and co-pilot of a cargo plane are unlikely to be identified through international processes currently in place. The cargo of explosives can be easily sourced at various places around the world without flagging that it is to be used in an attack. The packing of explosives as cargo can be done in various international locations but this also requires either sympathisers, bribery of officials or kidnapping threats against official's families to produce an explosive cargo and a false cargo manifest for clearance to land by Australian Authorities prior to takeoff. Hostile Governments just fake the manifest.

All of these deceptions have occurred in the past:

- The 9/11 attacks in the US where a terrorist group trained as pilots before undertaking the attack
- More recently two printer bombs out of the Yemen where the explosive devices were hidden within printer cartridges within the cargo (Dodd, Norton-Taylor and Harris, 2010)
- The downing of Metrojet flight 9268 in the Sinai where an explosive device in the cargo hold brought down the plane (Roe, 2015, RT, 2015).

4. Failure in the EIS for Badgerys Creek

The EIS that was published was not an EIS that fulfilled the requirements of the legislation as it did not assess the impact of terrorism or pilot suicide on Warragamba dam or similar threats including normal accidents to critical infrastructure around this airport. These include:

- Failure of a Dam Wall at Warragamba or Prospect Reservoir due to aircraft impact.
- Failure of Eastern Creek and Kemps Creek electrical distribution centres due to aircraft impact
- The gas pipeline measuring centre at Horsley Park due to aircraft impact
- The nuclear power plant and low level radiation waste dump at Lucas Heights due to aircraft impact.

The previous EIS in 1997 looked at controlled flight into terrain (CFIT) accidents but with the previous generation of aircraft at a striking angle of 20 and 60 degrees. The current EIS ignored many aspects needed to reassess this risk:

- The vulnerability of the Warragamba dam to terrorism or pilot suicide. This scenario is considerably different from a CFIT accident due to the ability to fly the aircraft at full speed into the dam wall at low level. This speed is well above the normal commercial speeds which aim to conserve fuel efficiency. This increases both the energy and the momentum at impact

that can result in breaching the top 30m of the dam. Once the dam is breached in this way, the hydraulic pressure behind the dam, assuming it occurs when the dam is near full, will destroy the rest of the dam.

- It ignores the cargo fleet makeup 20 years from now when A380s will be used for major long haul cargo. They are already being used for this purpose in certain parts of the world. The engines on these aircraft have much more thrust than those on commercial aircraft of 20 years ago.
- It ignores cargo capacity that ensure destruction of the dam. An A380 has a payload carrying capacity of 150 tonnes with a maximum takeoff weight of 575 tonnes (www.aircraftcompare.com). A full cargo of high explosive that is initiated at impact will ensure the dam wall is breached if the initial impact of the aircraft is not wholly successful.
- The population at risk in this scenario was not assessed. The NSW government has recognised that the Hawkesbury Nepean valley has the highest flood risk in the State (NSW Government, 2016). A 1 in 200 year flood risk study (Molino Stewart, 2012) yields an estimate of the population that would be affected by flooding as approximately 350,000 residents in the Penrith, Richmond, Windsor and Hills Districts of NSW. The population is expected to double by 2050 to 700,000 in the same area.
- There is significant difference between a flood and a sudden inundation due to the timescale over which it occurs. With a flood there is usually a forecast of heavy rain and potential for flooding occurring over several days. This allows time for the SES to put evacuation orders into place. An inundation which would see a wave approximately 75m high coming from Glenbrook Gorge at Emu Plains would cause a rise over the flood plain over a few hours at most. There will be no forewarning and if it occurs at night the majority of residences will be occupied and the ability to evacuate limited. An upper estimate is about 300,000 killed in this type of scenario based on the current population and will be double by 2050.
- The economic impact of this loss is about \$4 trillion based on comparison of the Fukushima nuclear disaster costs and Hurricane Katrina costs for New Orleans. It is made up of the following:
 - Cost of rebuilding the dam.
 - Cost of alternative water supplies to Sydney while the infrastructure is rebuilt.
 - Cost of loss of business due to lack of water supply.
 - Cost of moving businesses to other areas of the State or Country.
 - Reparation to families who have lost loved ones.
 - Rebuilding and refurbishing costs for residences affected.
 - Rebuilding and refurbishing other infrastructure such as electricity supplies as the main supply lines will be washed away and several distribution stations are in the flood zone.
 - Insurance and banking losses.
 - Legal costs such as a class action against the government and the decision makers.

5. Why can this occur?

The flight paths shown in the current EIS for both 2030 and 2060 go within 8km of Warragamba dam wall from both directions. The time to run into the dam wall is in the order of 90 seconds or less on a sudden turn. Any response to this turn can be broken down into following time delays:

- ATC or Defence recognising that an aircraft has gone off course
- ATC alerting Defence or Defence Alerting their command that Aircraft has gone off course
- Response time from Defence to get crews into the air

- Flight time of aircraft or weapon to intercept the plane

The sum of these will be greater than 90s. The nearest intercept capability currently is at Holsworthy (a helicopter squadron with hell fire missiles, other intercept capabilities are from Williamtown F18 strike fighter squadron and if in Port at Garden Island, a destroyer with surface to air missile of the correct range all of which need to be armed prior to use). While Glenbrook RAAF base or the Defence department ordinance depot at Orchard Hills could be fitted out with missiles, this is a public cost on developing what is a privately operated airport.

6. Conclusion

The conclusion is that modern terrorism and future hostile governments to Australia pose a real threat to Warragamba Dam if this airport is built which can't be intercepted in time or without significant defence spending to ensure an aircraft intent on destroying the dam is brought down. If the airport is built elsewhere outside the Sydney basin then this risk cannot occur. The other potential impacts on national critical infrastructure do not occur either.

7. Historical Evidence of Surprise Attacks

Reliance that Intelligence gathering would give notice of such a plot goes against historical evidence of surprise attacks:

- London bombings in 2007; the perpetrators had been noted as persons connected to a place where the main players were under surveillance. The individuals were not placed under surveillance due to lack of resources and were considered to be peripherals as a threat.
- Charlie Ebdon Attack Paris 2015.
- Paris Attacks 2015: The bomb maker was not found until after the Brussels bombing in March 2016 and the system had been set up so that there was a clear disjoint in communication between the making of the bomb materials and those who carried out the attack (R Booth, 2016).
- Belgium Group raids and findings 2016 after the Paris attacks; A manager of a nuclear facility in France was found to be under surveillance by the terrorist group. The intentions were not clear but it was suggested that this was being set up as a kidnapping threat to gain access to the facility (K Vick, 2016).

8. Critical Infrastructure

Badgerys Creek is at the convergence of several pieces of critical infrastructure for Sydney that are vulnerable to; airborne terrorist attack, pilot suicide and ordinary air accidents on takeoff or landing. Any of these events can destroy the infrastructure, cause significant death and injury and an economic loss in the trillions of dollars, putting Sydney, and in the worst case Australia, into recession for at least a decade.

The only realistic course for the future is to not to build an airport at Badgerys Creek but to build it outside of the Sydney Basin away from convergence of critical infrastructure. This avoids all the airborne risks on the infrastructure.

9. A sound economic strategy for the future

An economically sound strategy as an alternative to develop the economy in the process that is far greater than building Badgerys Creek is:

- Build a High Speed Rail (HSR) service linking the East Coast Cities between Melbourne and Brisbane over a 15 year period using the latest generation of train designs that will be put into service over the next 15 years in other countries capable of exceeding 400km per hour. This avoids the need for a new airport in Sydney as 45% of air traffic into Kingsford Smith Airport (KSA) is from the eastern seaboard.
- Building such a high speed rail removes the need for relocating KSA until there is more certainty in the rate of sea level rise that could make KSA inoperative. Uptake of high speed rail is of the order of 80% at speeds exceeding 400 km per hour (Clewlow, 2012; Oliver et al 2015). KSA would not reach capacity before 2040 at the earliest, plenty of time to build an eastern seaboard high speed rail road and then locate an airport along that route.
- Ensure that the energy needed for the rail link comes from renewables as this can kick start industries in the manufacture and supply of renewable energy technology that can be exported as well as supplying the home market.
- The opening up of regional centres by high speed rail in other countries has been shown to lead to non-linear economic growth. This creates a new economy in each of the centres (Ahlfeldt, Gabriel M. and Feddersen, Arne, 2010).
- The economic growth from building a full HSR network is much larger than the building of an airport and associated road infrastructure and the overall costs to 2060 are actually lower for the HSR on the public purse.
- Build a new airport serving Sydney along this HSR line after the line has been completed over a 10 year period when it is apparent that sea level rise will make KSA inoperative.

References:

<http://www.aircraftcompare.com/helicopter-airplane/Airbus-A380-Cargo/47>

Isabel Coles, 2015, *Islamic State militants use water as weapon in western Iraq*, Reuters, World | Wed Jun 3, 2015 3:31pm EDT <http://www.reuters.com/article/us-mideast-crisis-iraq-water-idUSKBN00J1TN20150603>

Kashmira Gander, 2015. *Isis use water as a weapon in Iraq, by shutting dam on the Euphrates River*, Thurs 4 June 2015, <http://www.independent.co.uk/news/world/middle-east/isis-use-water-as-a-weapon-in-iraq-by-shutting-dam-on-the-euphrates-river-10295763.html>

Richard Sisk, 2015, *ISIS Uses Water as a Weapon in Ramadi*, Jun 05, 2015, <http://www.military.com/daily-news/2015/06/05/isis-uses-water-as-a-weapon-in-ramadi.html>

Tobias von Lossow, 2016, *Water as Weapon: IS on the Euphrates and Tigris*, Stiftung Wissenschaft und Politik, German Institute for International and Security Affairs, SWP Comments 3 January 2016, https://www.swp-berlin.org/fileadmin/contents/products/comments/2016C03_lsw.pdf

RT, 2016, *ISIS escapes Syria airstrikes by hiding at country's largest dam, using hostages as human shield*, RT, 25 Jan, 2016 16:20, <https://www.rt.com/news/330083-tabqa-dam-crisis-isis/>

NSW government, 2016, *Reducing flood risk in Western Sydney*, 17 June 2016, <https://www.nsw.gov.au/media-releases-premier/reducing-flood-risk-western-sydney>

Molino Stewart, 2012, *Hawkesbury-Nepean Flood Damages Assessment*, molino_stewart_hn_flood_damages_report_final.pdf, September 2012

Caroline Mortimer, 2016, *Brussels bombings: Terror group 'were planning to attack nuclear power station'*, surveillance suggests, The independent, Friday 25 March 2016

<http://www.independent.co.uk/news/world/europe/brussels-attacks-airport-metro-bombings-isis-terror-group-nuclear-power-station-surveillance-footage-a6949821.html>

Jennifer Newton, 2016, *Two Belgian nuclear power plant workers have joined ISIS leading to fears the jihadis have the intelligence to cause a meltdown disaster*, The Daily Mail, 29 July 2016, <http://www.dailymail.co.uk/news/article-3510384/Belgian-nuclear-plant-guard-murdered-security-pass-stolen-two-days-Brussels-attacks.html>

V Dodd, R Norton-Taylor, P Harris, 2010, *Cargo plane bomb found in Britain was primed to blow up over US*, The Guardian, 11 November, 2010, <https://www.theguardian.com/world/2010/nov/10/cargo-plane-bomb-us-alqaida>

D Roe, 2015, *Russian plane likely felled by smuggled bomb in hold: intelligence*, The Sydney Morning Herald, 6 November, 2015, <http://www.smh.com.au/federal-politics/political-news/russian-plane-likely-felled-by-smuggled-bomb-in-hold-intelligence-20151105-gks65t.html>

RT, 2015, *Plane crash in Sinai a terrorist attack - Russian Security Service*, 17 November 2015, <https://www.rt.com/news/322393-russian-plane-crash-terrorist-attack/>

R Booth, 2016, *Brussels attackers 'had enough for 10 more bombs'*, The Guardian, 24 March 2016, <https://www.theguardian.com/world/2016/mar/23/brussels-attackers-had-enough-for-10-more-bombs-expert>

K Vick, 2016, *ISIS Attackers May Have Targeted Nuclear Power Station*, 25 March 2016, <http://time.com/4271854/belgium-isis-nuclear-power-station-brussels/>

Cascetta E, Coppola P, 2014, *Competition on Fast Track: an analysis of the first competitive market for HSR services*, Procedia – Social and Behavioural Sciences, 111, 176-185.

Clewlou , 2012. *The Climate Impacts of High-Speed Rail and Air Transportation: a Global Comparative Analysis*. Thesis submitted for the Requirements of Doctor of Philosophy. http://web.mit.edu/hsr-group/documents/Clewlou_Thesis_2012.pdf

Ahlfeldt, Gabriel M. and Feddersen, Arne (2010): *From Periphery to Core: Economic Adjustments to High Speed Rail*, <https://mpa.ub.uni-muenchen.de/25106/>