

Dear David,

To summarise my Wedgetail issue.

a. DSTO was advised by my 1992 paper "Defence of the North" that AWACS radars, of whatever construction, would have a disappointing long-range performance in Australia's area of interest.

This paper was stopped from being published - in an irregular manner, and I was hounded out in Jan 1995.

b. I warned the Defence Minister of my findings in 1996 when RFT was advertised.

c. The Minister's reply, written by DSTO's Peter Jennings, said their experts knew what they were doing.

I was formerly one of those experts.

d. The USAF knew of radars' deficiencies in our environment; they had their AWACS operating on eg K89.

Yet they still sold it to its ally, Australia!

e. I was not a radar expert; that's the point. I used the IREPS computer program obtained from DSTO's expert, John Whitrow, who also knew of AWACS deficiencies – because I showed him.

The point is, these deficiencies were well-known to even a non-expert like me – one didn't need to be a super-scientist – although I did have to ask the right questions. Yet we still went ahead with the purchase.

f. In 2008, Wedgetail was at last acknowledged by Defence to have a deficiency which could not be fixed.

"could not be fixed" because of Physics laws – as I showed back in 1992 and 1996.

g. I think there's an obvious deduction to be drawn from DSTO recommending Wedgetail despite knowing it could not work where we wanted it to.

Despite this, Federal Police will not address this as they told me it's too long ago and many of the people are no longer in DSTO. (...And so are protected.)

**Attention:** Minister for Defence, Senator John Faulkner.

**Copy:** Minister for Defence Personnel, Materiel and Science, Hon. Greg Combet.

**Subject: Failed Big-ticket Defence Projects**

Dear Minister,

Firstly, I was a Research Scientist with DSTO years ago. My employment there did not end happily as I kept producing ideas and results different from the perceived wisdom of the organisation – but I usually proved correct with time. Despite this, I have kept an interest in defence topics.

I believe that in recent months you, as Minister of Defence, and Greg Combet, as Defence Materiel Minister, have been understandably dissatisfied with procurement and development of systems within the Defence Department. Many of these projects have been publicly documented in newspaper reports. For example, *The Weekend Australian* (24Oct09) published a Defence Special Report describing the progress of defence projects, some of which are falling behind schedule.

One of these is **Project Wedgetail**. As you can see in attachment “**Wedgetail.doc**”, I predicted this exact problem in my 1991 paper “Defence of the North” – which was blocked. It also predicted problems with **Jindalee** (aka JORN) radar. Wedgetail.doc is a copy of a letter I sent to one of your predecessors, Hon. Ian McLachlan AO, in 1996, warning of what could be expected. As proof of my letter – DSTO has a habit of denying such things exist - I attach the reply from his advisor Peter Jennings (wedgereply.jpg”) telling me that they knew what they were doing, and thank you very much but..... very politely, of course.

As has been reported often and embarrassingly, the Turkish version of Wedgetail using the same MESA radar and aircraft-type operates well. Wedgetail has continuing poor performance suggesting DSTO still hasn't figured it out. Yet my 1991 paper and 1996 letter predicted just such behaviour as the radar operates in a different environment there, rather closer to that around southern Australia, rather than the tropics where there usually will be lesser performance – probably only 10% of predicted performance. That is, 10x as many, now vulnerable, AWACS needed!

**DSTO** tends to fly below the radar, so to speak, when the topic of Defence and its problems is raised. However, as its corporate logo was/is something like “To make Defence a smarter Purchaser” (no mention of home-made products!) providing scientific guidance concerning purchases, it should be the first organisation examined. It is obviously an organisation where it is possible for external influences upon individuals to produce a large return. I remember vividly that one of my bosses would often complain, enviously, that even his plumber was better paid than him.

As you can imagine, my wife and I have suffered a great deal from DSTO's actions against me, including the loss of my career.

Sincerely,

P.J.CARSON,  
13Dec09.

The Minister of Defence,  
Hon. Ian McLachlan AO.

### **PROJECT Air 5077: WEDGETAIL**

An advertisement in The Australian, May 8, 1996, invites registration of interest in Project Wedgetail which is to provide an Airborne Early Warning and Control (AEW&C, more usually seen written as AWACS) capability for the ADF. **I wish to warn that such systems will have a disappointing tactical performance in the likely operational area of interest to Australia**, ie tropical maritime environments. I am also aware that at least one manufacturer readily acknowledges the difficulties presented by such environments.

Radars and radar-detecting sensors, the main sensors carried by AWACS, have reduced or unreliable performance in such environments. This is a fundamental characteristic of radio-frequency waves. (Supporting classified evidence on radar performance from Kangaroo Exercises is available. Jindalee radars operate in a different fashion. They pass through the atmosphere at near-vertical incidence, rather than the near-horizontal transmission of conventional radars, and will not be limited by this characteristic - although Jindalee has its own set of problems with the environment that curtail its tactical value). AWACS' communications ability is also reduced but to a smaller extent. One can check the success or otherwise of AWACS aircraft by their results in detecting drug-running craft in the Caribbean.

*Reality Check: Is Miami a major entry port for the US cocaine trade?*

**Without their sensing abilities, AWACS become expensive, vulnerable targets.**

AWACS *have* been used successfully - by the US Navy in cold-climate maritime work, and over land in the Gulf War. They can be magnificent units in areas for which they were designed. This has encouraged potential purchasers to overlook their shortcomings and glibly accept that AWACS will always have awesome performance - without studying manufacturers' claims very closely. Let the buyer beware!

*I am a research scientist at DSTO, Salisbury, with expertise in radar system performance (Attachment A).*

Sincerely,

P.J.CARSON.  
1 August, 1996.

## ATTACHMENT A - Radars.

I am a research scientist at DSTO, Salisbury - although, it appears, not for much longer. I started in Propulsion Division (extinct in 1991), working on gun ammunition until 1985. I worked in **Combat Systems** Division, from 1986 to about 1991, when the Division was liquidated. Its personnel were incorporated into Information Technology Division where I've been working since. I studied and gave advice to the Services on the effectiveness of combat systems. These included

1. the air defence systems on the ANZAC frigates (Navy),
2. HARM missiles (Air Force),
3. ground-based air defence missile systems (Army), etc.

All the systems I dealt with had radar detection effectiveness as a large component. Consequently, I was obliged to gain familiarity with radar performance capabilities.

In 1990, I presented a paper on the effect of atmospheric conditions on the detection of aircraft by naval radars. The gist of the paper was that under the influence of thermal and particularly humidity effects, the air of the atmosphere forms layers of varying densities, ie, the air density changes in a non-uniform manner. For example, everyone has seen the distorting effects of heat haze on light waves. The effects on the lower frequency waves of radar are very much worse.

These layers greatly distort the ability of *all* radars to give a true picture, and often render line-of-sight targets invisible to radar. In very humid and hot conditions, as in tropical waters year-round, and also to a lesser extent, but less predictably over tropical land, these layers act as radar ducts allowing air targets to hide - in a manner similar to the way submarines can hide using sonar ducts - until too late.

This ducting of radar waves is well known although its quantification, such as I presented, is less so. That is what my paper was about - to give actual distances at which several types of air targets would be detected by specific radars so that this would be of direct help to the Services. Sometimes ducting allows greatly increased detection ranges than "theoretical", but other times much reduced. Specific instances of this ducting can be highly classified - see Defence Signals Directorate.

In 1991, I wrote a discussion paper, "The Defence of the North", which, among other topics, pointed out the deficiencies of AWACS in such an environment and suggested ways of improving the detection of both sea- and air-borne incoming targets. *The methods were low cost, largely using existing resources, and did not involve the purchase of AWACS.* The paper was vetted by someone from Air office who rejected it out of hand - I suspect RAAF wanted to buy glamorous AWACS aircraft. (Also, I had previously written a paper that demonstrated that HARM missiles, which RAAF wanted to purchase, would be ineffective - at least, for the role RAAF had proposed). "The Defence of the North" has not been allowed to be published.



Office of the

## Minister for Defence

10 SEP 1996

Dear Dr Carson

I refer to your letter of 1 August 1996 to the Minister for Defence concerning the provision of an Airborne Early Warning and Control capability for the Australian Defence Force. The Hon Ian McLachlan AO MP has asked me to respond on his behalf.

The Government places a high priority on maintaining an effective air surveillance and air defence capability for Australia. It recognises the valuable contribution that could be made by an Airborne Early Warning and Control capability to our capacity for detection of potentially hostile aircraft and the coordination of a response, and has publicly stated its commitment to identifying an affordable system which meets Australia's needs.

In this regard, the Commonwealth is in the process of shortlisting potential prime contractors to undertake competitive funded design work and to provide proposals for the complete capability. As for the concerns you expressed, the systems that are offered will be rigorously evaluated by skilled personnel drawn from a number of areas within Defence to assess whether the specified capability requirements for the platform, primary radar, mission equipment and system integration are met. Key objectives will be to acquire the best possible solution that meets capability requirements for effective performance in the Australian environment and achieves best value for money, and to create a high level of indigenous through-life support and an effective capacity for future enhancement.

Yours sincerely