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# European Security and the Significance of the F-35

By Air Commodore Dr. Frans Osinga

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## Introduction

The introduction of F-35 fighters in European air forces marks a momentous transition from 4<sup>th</sup> generation fighters to the 5<sup>th</sup> generation. But the F-35 means much more than the mere replacement of one fighter by another one. The real significance of the F35 is strategic and political in nature, and must be assessed from a European security perspective. And that perspective is worrisome.

## Addicted to the Air Power Advantage

The west has become addicted to its air power dominance. Since Operation Desert Storm in 1991 the military and political utility of air power has vastly increased. Indeed, a revolution in military affairs took place which was largely based on the rapid evolution in air power capabilities. Stealth fighters and bombers, persistent Intelligence Surveillance Reconnaissance (ISR), the proliferation of precision guided munitions, Suppression of Enemy Air Defence (SEAD) and Electronic Warfare (EW) capability, networking of sensors, shooters and Command and Control (C2) nodes, all combined to make the offence superior to defence in air warfare. The resulting persistent air superiority



The F-35's inherent stealth, EW, SEAD and ISR features address a significant capability gap that threatens to paralyze future European air operations. However, it will be a long time before Europe can boast a substantial number of operational F-35 squadrons. The F-35 will therefore likely become a critical 'high demand-low density' asset needed to ensure NATO can conduct long range precision strike as well as Defensive or Offensive Counter-Air missions in a contested environment.

offered a virtual sanctuary that could be exploited for various purposes, such as ISR, Interdiction, Close Air Support (CAS) and strategic attacks. Air strikes became unprecedentedly accurate. With Precision Guided Munitions (PGMs), one fighter could attack several targets in one mission, including dug-in tanks and artillery and intense air attacks could now obliterate entire armoured columns. The result was a drastic shortening of the time required and the risk involved for ground units to complete the coalition victory, as Operation Iraqi Freedom once again demonstrated. Conventional strategic attack too was rediscovered. Precision munitions, stand-off and stealth capabilities offered new possibilities for strategic attacks against multiple target-categories of a nation state (military units, leadership, and critical infrastructure). Even if targets were in the vicinity of civilian objects, it was now possible to attack these nearly simultaneously in order to rapidly degrade the functioning of the entire 'enemy system' from the first moment of a campaign and cripple the strategic command capabilities before attacking fielded forces. Finally, Desert Storm suggested that military operations need not necessarily entail massive civilian

casualties and the measure of 'collateral damage' to civilian infrastructure seemed to be controllable.<sup>1,2</sup>

In the arena of irregular warfare air power too has made huge strides in effectiveness due to persistent and wide area ISR, highly precise CAS and interdiction with unprecedented short response times and improved air-land integration. In stabilization and Counter-Insurgency (COIN) missions this provides forces protection, allows Special Operation Forces (SOF) teams to cover wider areas than before with lower risk, and can assist so-called proxy-forces. This 'Afghan Model' has proven its worth in Afghanistan (2001–2014), Northern Iraq (2003), Libya (2011) and Mali (2013) and currently in the fight against Daesh.<sup>3</sup> Air power is also one of the few assets available that can target terrorist groups and guerrilla fighters in remote regions, and do so relatively effectively and cheaply without risks associated with the employment of large numbers of ground troops.<sup>4,5</sup>

Enhanced effectiveness and decreased risks translated into greater political utility to the extent that air power has become the 'go-to' military instrument for many



international crises. Thus immediately following Operation Desert Storm, offensive air power was employed to enforce No Fly Zones in the context of peace operations in the Balkans and northern Iraq and subsequently also in southern Iraq. During second half of the 1990s western air power was twice pivotal as the key military instrument of Western coercive diplomacy against Serbia (Operation Deliberate Force and Operation Allied Force). In 2003, the US-led coalition used its air dominance so effectively against Iraqi ground forces that the ground offensive proceeded virtually unopposed and with unprecedented speed to Baghdad to topple Saddam Hussein. In 2011, NATO air power was employed in Libya in support of the UN doctrine of Responsibility to Protect, which amounted to a campaign of coercive diplomacy. Indeed, precision age air power suits the western sensibility concerning collateral damage and has become the defining and indeed normative feature of the western way of warfare.

## The Air Power Gap: The Paradox

There is a remarkable paradox though. While Europe's security concern from 1990 till 2014 have put an emphasis on expeditionary and power projection capabilities – which are precisely some of the key attributes of air power – Europe disinvested in air power. It has underappreciated the extent to which the new western way of war with its emphasis on risk mitigation, casualty sensitivity, and force protection depends on a continuous umbrella of sophisticated air power assets that provide rapid precision intelligence and if necessary kinetic response capabilities. Europe's often discussed capability gap is largely an air power gap – as became evident during operation Allied Force: US forces catered for 60% of all sorties, dropped 80% of all expended ordnance, provided 70% of all support sorties and 90% of all SEAD and EW missions, not to mention the fact that without US support NATO would have lacked effective command facilities.<sup>6</sup>

This full munition display of a Boeing B-52 Stratofortress strategic bomber demonstrates overwhelming air power. Since 1990, European NATO nations disinvested a lot in in own air power and therefore became increasingly reliant on such US capability along with important enablers such as EW, SEAD, AAR, ISR, and C2.



Europe was fatally and unacceptably dependent on US 'enablers' and 'precision shooter'. Already in 1997 senior defence analysts warned Europe to 'mind the gap' as Europe was losing its ability to operate alongside US forces.<sup>7</sup>

In response, since 1999 NATO has launched several initiatives, starting with the Defence Capabilities Initiative (DCI), which identified six areas of high priority involving strategic air lift, air-to-air-refuelling (AAR), SEAD, Support Jamming, PGM and Secure Communications.<sup>8</sup> Over the past decade by and large those shortfalls have persisted.<sup>9</sup> Budgetary constraints were one culprit of Europe military deficit,<sup>10</sup> but the heart of the problem is policy re-orientation and force restructuring. Most European armed forces have retained their orientation on static man-power intensive territorial defence. By 2005 Europe still had 1.5 million people in arms, and in excess of 10,000 tanks. But only 10 to 15% of those troops were actually deployable.<sup>11</sup> NATO thus embarked on a 'Transformation' initiative which stood for accelerated innovation, catching up on the RMA, adopting the Network Centric Warfare concept, improving expeditionary capabilities, and closing the capability gap, in short, adopting the New American Way of War.<sup>12</sup> However, complacency,<sup>13</sup> vested service interests, inter-service rivalry, different perspectives within political and military elites on the necessity to really transform their militaries in light of the absence of real security threats, and other societal priorities – the financial and economic crises – all contributed to the disappointing pace of military innovation in Europe.<sup>14</sup>

Thus, European air forces continued their decline, reducing the number of bases and command facilities and disbanding NATO's once formidable Ground Based Air Defence (GBAD) capabilities. Very few air forces invested in long range stand-off strike, SEAD or EW capabilities. AAR and ISR capabilities grew only very slowly if at all. By 2011 combat capable fighter strength was about 1,200, down from 3,000 two decades earlier, with numbers continuing to fall rapidly annually. This implied that air campaign intensity and sustainability would suffer dramatically, keeping in mind that a small scale air campaign such

as Allied Force eventually required about 1,000 combat aircraft. Importantly too, two decades after stealth had demonstrated its huge operational and strategic relevance, no European military had a stealthy 5<sup>th</sup> Generation aircraft in its inventory.

## Addicted to US Support

The over-reliance on US so-called 'enablers' (long range strike, EW, SEAD, ISR, C2) became increasingly problematic for the Alliance. Operation Unified Protector (OUP), the intervention in Libya in 2011, once again demonstrated the severity of the air power gap.<sup>15</sup> In a repeat of Operation Allied Force, OUP was probably impossible without US support despite the fact that it was a very limited operation with only 55–150 daily sorties (it never achieved the 350 daily sortie rate aimed for). Sustainability was becoming a distinct issue, too: a number of European coalition partners had to withdraw their commitment during the operation due to maintenance requirements. Others suffered shortage of precision munitions quite early into the operation, suggesting that stockpiles were dramatically low. Several analysts thus concluded that without US support, European militaries can most likely perform only one moderate-sized operation at a time and will be hard-pressed to meet the rotation requirements of a protracted, small-scale irregular warfare mission.<sup>16</sup> And US support has become in doubt. In June 2011, US Defence Secretary Gates predicted a NATO consigned to 'military irrelevance' in a 'dim if not dismal future unless allies stepped up to the plate [...]. US political leaders [...] may not consider the return on America's investment in NATO worth the cost.'<sup>17</sup> Moreover, the so-called pivot to Asia implied a significant shift of the US foreign and defence policy from Europe and the Middle East to the East and South-East of Asia.<sup>18</sup> This means that it can no longer be assumed that under any circumstance the US will be willing to make substantial contributions in terms of capabilities and competencies to Europe. Therefore, as one official study noted in 2014, Europe must take into account that it has to be capable of independently securing its interests at the periphery of NATO's geographical Area of Operational Responsibility. 'With the current

shortfalls, NATO has a challenge in meeting its Level of Ambition. Given the trends the gap between capability and ambition will only become worse.<sup>19</sup>

## A Revisionist Russia

With the Spring 2014 annexation of the Crimea, the emergence of a revisionist Russia has transformed the air power gap from primarily an operational handicap during expeditionary interventions, as well as a political embarrassment, into a security problem. Russia has become an unpredictable power, according to Francois Heisbourg, and indeed Russia displays increasingly an anti-western political narrative which is fuelled by nationalism, honor, and a historic perception of identity and humiliation by the West. It manifests an enmity towards international law, western institutions and values. It seemingly wants to regain the Cold War era spheres of influence between Russia and Western Europe.<sup>20</sup> Its military doctrine and capabilities seem geared to support this political aim. In waging persistent shadow wars using cyber-operations, the deployment of special forces dressed as civilians and 'little green men', disinformation campaigns and denying involvement, it deliberately tries to remain below the threshold of NATO Article 5. This Hybrid Warfare,<sup>21,22</sup> however, may not be the real or only problem now facing Western Europe.<sup>23</sup> What the Crimea crisis really demonstrated was the rapid modernization of Russian conventional forces. It demonstrated the ability to conduct intimidating snap exercises – some involving up to 150,000 military personnel – along the borders of Eastern European countries involving large army and air formations. Part and parcel of this new strategy is the threat of nuclear weapons. The combination of these capabilities translates into options to rapidly create facts on the ground forcing NATO and the EU to develop quick responses. Russia could then influence that response by threatening with nuclear escalation.<sup>24</sup> While this does not necessarily mean Russia is prepared for a direct confrontation with NATO, Russian Prime Minister Medvedev did not reassure Western leaders when he stated that there is the risk of a 3<sup>rd</sup> world war and the emergence of a new cold war.<sup>25</sup>

The 2016 NATO Warsaw Summit communiqué recognizes that Russia's 'aggressive actions, provocative military activities and its demonstrated willingness to attain political goals by the threat and use of force are a source of regional instability and fundamentally challenge the Alliance'.<sup>26</sup> Subsequently, since 2014 a flurry of initiatives was taken to demonstrate resolve and unity, avoid the perception of weakness that Russia could exploit, and to re-assure Baltic, Central European and Scandinavian countries. A renewed emphasis has been placed on deterrence and collective defence.<sup>27</sup> The Very High Readiness Joint Task Force (VJTF) was launched, small headquarters would be established and the NRF was to be expanded. Small military capabilities would be prepositioned in the east, air policing would be intensified and the number of exercises enhanced. In Estonia, Latvia, Lithuania and Poland multinational battalion sized battle groups would be established to 'unambiguously demonstrate, as part of our overall posture, Allies' solidarity, determination, and ability to act by triggering an immediate Allied response to any aggression'.<sup>28</sup>

## The A2AD Challenge: Losing the Certainty of Air Superiority

However, Russia's military modernization is particularly geared towards negating NATO's asymmetric advantage in the air power arena, undermining NATO's conventional deterrence capabilities. Russia has invested heavily in Anti-Access and Area-Denial (A2AD) capabilities: EW systems, cyber warfare capabilities, and long range Surface to Surface Missiles (SSM) and Surface to Air Missile (SAM) systems. As a result, today, the West needs to reconsider how to preserve Western supremacy in the commons (sea, air, space and cyberspace) and how to use the commons to project power in a contested environment. As US Air Force (USAF) General Frank Gorenc, then commander of US Air Forces in Europe and Africa stated, 'The advantage that we had from the air, I can honestly say, is shrinking [...]. Those A2/AD capabilities are fundamentally undermining the essence of the American way of war'.<sup>29</sup>

This problem is particularly acute along the borders of Europe and in its heart; Kaliningrad.<sup>30</sup> With its amassed



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Russia deployed their most modern, mobile surface-to-air, anti-ship coastal defence, and short-range ballistic missile systems to Kaliningrad. This forms an A2AD bastion posing a threat to large areas of the Baltic region to include NATO and EU territory.

air defence and surface to surface missile capabilities it can deny air operations over large parts of the Baltics and Poland, it can threaten military facilities and transport infrastructure – and thus reinforcement (such as the VJTF) – in eastern Europe and well into Germany and deny the use of sea lines of communications. US capabilities in Europe are not sufficient to tackle this A2AD problem. Russia is increasingly able to create positions of local military advantage in its immediate vicinity, advantages that extend to the ability to seize and hold territory, and then to be able to deploy higher order capabilities, ranging from A2AD systems to nuclear weapons, to block, deter, negate or frighten NATO in its attempts to push these forces back.<sup>31</sup> A RAND study concluded that ‘As currently postured, NATO cannot successfully defend the territory of its most exposed members.’<sup>32</sup>

## The Meaning of the F-35: Restoring Conventional Deterrence

NATO’s array of initiatives since 2014 amount to re-discovering the lost art of conventional and nuclear deterrence, territorial defence and conventional warfare. Air power plays a large role in this. To wit, nine out of 16 NATO capability priority shortfall areas relate to air power. In no small measure the conventional deterrence problem equates with ensuring deterrence credibility by addressing the persistent capability gap in which Air C2, Airborne Electronic Attack (AEA), AAR, long range precision strike, SEAD, ISR, air superiority, and Theatre Ballistic Missile Defence (TBMD) feature prominently. Without improving air defence and strike capabilities, NATO will be hard pressed to effectuate conventional deterrence. The



certainty of the air sanctuary has disappeared. Against Russia's SAM systems, NATO air defence and offensive counter air operations will once again become a slugging match. Russia's SSMs form a direct threat to NATO's concentrated few scarce Air C2 facilities and air bases. Joint campaign plans therefore once again need to consider careful allocation of assets and phasing; warfare like Desert Storm and Iraqi Freedom is likely infeasible. Information dominance will not happen as ISR missions may well be impossible. Finding and killing SAM systems and the related C2 facilities may subsequently take a very long time. During this phase, Interdiction and CAS missions with current PGMs such as the Joint Direct Attack Munitions (JDAM) will produce high attrition rates until long range stand-off munitions can 'out-range' the Russian SAMS systems. Campaign intensity, persistence and sustainability will become a pressing concern as will ammunition stockpiles, the scarcity of military airfields with hardened facilities, the lack of GBAD, and the lack of redundancy in Air C2 facilities.<sup>33</sup>

While the introduction of the F-35 in Europe certainly does not solve all issues, it ensures interoperability with the US military, it limits the operational dependency on US support in air campaigns and its inherent stealth, EW, SEAD and ISR features address a significant capability gap that threatens to paralyze future European air operations. It will become a critical asset in Europe's air defence and strike capabilities as non-stealth platforms have a very limited chance of survival in the face of Russia's A2AD threat. The F-35 will probably also be called upon as SEAD and sweep escort for 4<sup>th</sup> Generation fighters which will continue to form the backbone of many European operations. But quantity is a quality. It will be a long time before Europe can boast a substantial number of operational F-35 squadrons and even when these are all-in theater, the number of F-35s will probably never exceed 500. The F-35 will thus become a critical 'high demand-low density' asset ensuring NATO can conduct long range precision strike missions as well as Defensive or Offensive Counter-Air missions in a contested environment. All this implies that the F-35 will become a crucial foundation for NATO's conventional deterrence and war fighting capability in the new

A2AD era. And with the proliferation of modern SAM systems (as well as 5<sup>th</sup> Generation Chinese and Russian fighter aircraft) to many other states, the introduction of the F-35 is a first necessary step to ensure European air forces remain capable to conduct interventions effectively and with modest risk levels that Europe's politicians and publics have become accustomed to. That is the real significance of the introduction of the F-35. ●

1. This brief overview of air power developments draws from: Frans Osinga, 'Air warfare in the postmodern era'. In Julian Lindley-French and Yves Boyer (eds.), *The Oxford Handbook of War*, Oxford University Press, 2010.
2. For descriptions of the new western way of war see for instance: (1) Martin Shaw, 'The New Western Way of War', Polity Press, London, 2005. (2) Christopher Coker, 'Humane Warfare; the New Ethics of Postmodern War', Abingdon, Routledge, 2002.
3. For an up to date discussion of air power in COIN see: Joel Hayward (ed.), 'Air Power, Insurgency and the "War on Terror"', Royal Air Force Centre for Air Power Studies, Cranwell, 2009.
4. Benjamin Lambeth, 'Air Power Against Terror', RAND, Santa Monica, 2005.
5. For a welcome study of the air operations of Iraqi Freedom, see: Benjamin Lambeth, 'The Unseen War, Allied Air Power and the Takedown of Saddam Hussein', Naval Institute Press, 2013, Annapolis, MD.
6. For a full analysis, see for instance John Peters et al. 'European Contributions to Operation Allied Force; Implications for Transatlantic Cooperation', RAND, Santa Monica, 2001.
7. David Gompert, Richard Kugler and Martin Libicki, 'Mind the Gap, Promoting a Transatlantic Revolution in Military Affairs', Institute for National Strategic Studies, National Defence University Press, Washington, D.C.
8. This discussion draws from: Frans Osinga, 'The Rise of Transformation'. In: Theo Farrell, Terry Terriff and Frans Osinga, 'A Transformation Gap, American Innovations and European Military Change', Stanford University Press, Stanford, 2010.
9. For a very detailed study of European air power developments and the problem of the air power gap, see: Christian Anrig, 'The Quest for Relevant Air Power', Air University Press, Maxwell AFB, Alabama, 2011.
10. Kees Homan, Bert Kreemers, Frans Osinga, 'De Militaire Staat van de Europese Unie', Clingendael Research Paper, The Hague, May 2001.
11. For a detailed account, see: Bastian Giegerich and William Wallace, 'Not Such a Soft Power: the External Deployment of European Forces'. In *Survival*, vol. 46, no. 2, Summer 2004, p. 163–184.
12. For this argument, see for instance: (1) David Gompert and Uwe Nehrlich, 'Shoulder to Shoulder, The Road to US-European Military Cooperation', RAND, Santa Monica, 2002. (2) Hans Binnendijk and Richard Kugler, 'Transforming European Forces'. In *Survival*, vol. 44, no. 3, Autumn 2002.
13. Hans Binnendijk, 'The Impact of Global Trends on Air and Space Power in NATO'. In: *Air and Space Power in NATO, Future Vector Part I*, Joint Air Power Competence Centre, Kalkar, Jul. 2014, p. 39.
14. Stephen Larrabee, Stuart E. Johnson, et al. 'NATO and the Challenges of Austerity', RAND, Santa Monica, 2012, p. IX.
15. For an excellent comprehensive study of OUP and its implications for the Alliance, see: Karl Mueller (ed), 'Precision and Purpose, Airpower in the Libyan Civil war', RAND, Santa Monica, 2015.
16. Ibid 14.
17. Ian Traynor, 'US Defense Chief Blasts Europe over NATO', *The Guardian*, 11 Jun., 2010.
18. U.S. Department of Defense, 'Sustaining U.S. Global Leadership: Priorities for 21<sup>st</sup> Century Defense', Jan. 2012.
19. Joint Air Power Competence Centre, 'Diminishing Air Power Capabilities', In *Present Paradox, Future Challenge*, Kalkar, Mar. 2014, p. 77.
20. For such an assessment of the challenge that Russia poses to Western Europe, see for instance: (1) Matthew Kroenig, 'Facing Reality: Getting NATO Ready for a New Cold War', In, *Survival*, Volume 57-1, 2015, P. 49–70. (2) François Heisbourg, 'Preserving Post-Cold War Europe', In *Survival*, Volume 57-1, 2015, p. 31–48.





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21. For a discussion of Russia's hybrid warfare concept see for instance: Alexander Lanoszka. 'Russian Hybrid Warfare and Extended Deterrence in Eastern Europe'. In: *International Affairs* Volume 92-1, 2016, p. 175–195.
22. For a lengthy treatment of Russian Hybrid Warfare from a NATO perspective, see: Guillaume Lasconjerias and Jeffrey Larsen (eds). 'NATO's response to Hybrid Threats', Forum Paper 24, NATO Defence College. Rome, 2015.
23. (1) Mark Galeotti. 'Hybrid, ambiguous, and non-linear? How new is Russia's 'new way of war?' In *Small Wars & Insurgencies*, Volume 27-2, 2016, p. 82–301. (2) Samuel Charap. 'The Ghost of Hybrid War'. In *Survival*, Volume 57-6, 2015, p. 51–58.
24. See Elbridge Colby & Jonathan Solomon. 'Facing Russia: Conventional Defence and Deterrence in Europe'. In *Survival*, Volume 57-6, 2015. P. 21–50. (2) Johan Norberg. 'Training to Fight: Russia's Major Military Exercises 2011–2014'. Swedish Defense Research Agency (FOI) Report. 5 Dec., 2015. Online at: <https://www.foi.se/reports/summary?reportNo=FOI-R-4128-SE> (accessed Jan. 2016), p. 62.
25. Sam Jones. 'Dmitry Medvedev warns of "new cold war"'. *Financial Times*, 13 Feb 2016, online at: <http://www.ft.com/cms/s/0/a14e8900-d259-11e5-829b-8564e7528e54.html#axzz4iVoaRgz>.
26. 'Warsaw Summit Communiqué'. Issued by the Heads of State and Government participating in the meeting of the North Atlantic Council. Warsaw 8–9 Jul. 2016. Online at [http://www.nato.int/cps/en/natohq/official\\_texts\\_133169.htm](http://www.nato.int/cps/en/natohq/official_texts_133169.htm).
27. Ibid.
28. Ibid. See the communiqués of Wales and Warsaw for the full array of initiatives and plans.
29. Franz-Stefan Gady. 'US Air Force: Russia Has Closed Air Power Gap With NATO'. In *The Diplomat*, 16 Sep. 2015. Online at: <http://thediplomat.com/2015/09/us-air-force-russia-has-closed-air-power-gap-with-nato/>.
30. Stephan Frühling and Guillaume Lasconjerias 'NATO, A2/AD and the Kaliningrad Challenge'. In *Survival*, Volume 58-2, 2016, p. 95–116.
31. Dave Majumdar. 'Can America Crush Russia's A2/AD "Bubbles"?'. In *The National Interest*, 29 Jun. 2016. Online at <http://nationalinterest.org>.
32. David A. Shlapak and Michael Johnson. 'Reinforcing Deterrence on NATO's Eastern Flank: Wargaming the Defense of the Baltics'. RAND Santa Monica, 2016, p. 1.
33. (1) Jay Ballard. 'What is Past is Prologue – Why the Golden Age of Rapid Air Superiority is at an End'. In *Journal of the JAPCC*, Edition 22, Spring/Summer 2016, p. 56–64. – (2) Timothy Walton. 'Securing the Third Offset'. In *Joint Forces Quarterly* 82, 3<sup>rd</sup> Quarter 2016: p. 6–15.

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