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CANADIAN ARMED FORCES' EFFECTIVENESS IN TARGETING WITH AIR POWER DURING OP MOBILE AND OP IMPACT

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JCSP 42

Exercise *Solo Flight*

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Often cited as a critical function in joint exercises and in recent operations, there has been recent emphasis placed on the importance of 'targeting' within the Canadian Armed Forces (CAF) with the formation of the CAF Targeting Implementation Initiative.[1] Targeting ranges in complexity from conceptual design and analysis to planning and execution. It spans the strategic, operational, and tactical levels, and can be deliberate or dynamic. By definition, targeting is aiming or directing, such as aiming a weapon at a target.[2] At the operational level it is the systematic process of matching capabilities to targets, complimentary to the Joint Air Tasking Cycle. Targeting also comprises a conceptual design process used to analyse complex system of systems. The 'butterfly effect' serves as a metaphor of this concept as one of the theoretical challenges for targeting is accounting for unintended second and third order effects. It is the elasticity of targeting that has caught the attention of senior leadership within the CAF and conversely developed into a quagmire that potentially threatens combat effectiveness.

The operational level of targeting warrants closer examination since it bridges the tactical and strategic levels of war, as well design, planning and execution considerations. The CAF's recent conduct of air operations over Libya and Iraq offer a unique opportunity to analyse operational targeting with air power. OP MOBILE, Canada's named operation in support of *Operations Odyssey Dawn* (OOD) and *Unified Protector* (OUP) demonstrated the potential of air power capabilities during an armed intervention. The unprecedented responsiveness and challenges in directing air power capabilities also exhibited the importance of targeting.

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[1] Government of Canada, "The Chief of the Defence Staff announces Canadian Armed Forces General and Flag Officer senior appointments, promotions, and retirements," accessed 9 May 2016, http://news.gc.ca/web/article-en.do?nid=1028409

[2] Oxford Dictionary defines targeting as, "select as an object of attention or attack" or "aim or direct (something)" http://www.oxforddictionaries.com/us/definition/american_english/target?q=targeting#target__12

Although initially ad hoc and heuristic in its application, the CAF proved quite effective in achieving the desired effects and identified many lessons. Four years later, the CAF had the opportunity to apply those lessons during another air-centric operation, OP IMPACT, Canada's named operation in support of *Operation Inherent Resolve* (OIR).

It will be shown that the CAF's enthusiasm with 'targeting' has strayed from its pragmatic application during OP MOBILE that focused on enabling combat employment and achieving effects, into a risk management bureaucratic process that hampered effectiveness during OP IMPACT. OP IMPACT was less effective because targeting authorities were not commensurate with the competency of commanders, resulting in the situation of 'ineffective command' as described by the Pigeau and Ross balanced command envelope.

It is challenging to evaluate all of the relevant evidence provided by these two operations because of the classification of much of the information and sensitivity around targeting directives. However, open source data and discussions with key personnel involved in the targeting process of both operations contribute to our understanding of the process and offer insight to evaluate the CAF's performance and effectiveness in broad terms and draw conclusions why effectiveness was impaired during OP IMPACT. Targeting will be discussed as it relates to these two air-centric operations by providing context and explanation of the operational assessment. Finally, it will be shown how some of the targeting policies and processes put in place during OP IMPACT promoted ineffective command and impacted combat effectiveness.

OPERATIONAL ASSESSMENT OF TARGETING

The Joint Targeting Cycle depicted in figure 1 is an iterative process that provides a useful framework in the conduct of deliberate and dynamic joint targeting.[3] The cycle begins with the end state and commander's objectives and ends with the assessment. An important activity in these stages is…

> the development of observable, achievable, and reasonable measures and indicators (such as measures of effectiveness (MOE) and measures of performance (MOP)) to assess whether the effects and objectives are being or have been attained. Measures and indicators help focus target development within the joint targeting process, and are critical to enable assessment.[4]

MOP are indicators used to asses friendly actions tied to measuring task accomplishment. They are generally quantitative, but may also apply qualitative attributes to task accomplishment.[5] MOPs help answer the question, 'are we doing things right?'[6] MOE are indicators used to help gauge the attainment of end-state conditions, achievement of objectives, or creation of effects.[7] They do not measure task accomplishment or performance. MOE are typically more subjective than MOPs and can be crafted as either qualitative or quantitative.[8] MOEs help answer the question, 'Are we doing the right things to create the effect(s) on the operational environment (OE) that we desire?'[9]

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[3] United States, Joint Chiefs of Staff. Joint Targeting. Joint Publication 3-60. Washington, D.C.: Joint Chiefs of Staff, 2013, II-2.
[4] *Ibid.*, II-4.
[5] *Ibid.*, C-7.
[6] United States, Joint Chiefs of Staff. Operation Assessment. Joint Doctrine Note 1-15. Washington, D.C.: Joint Chiefs of Staff, 2015, A-5.
[7] *Ibid.*, A-4.
[8] United States, Joint Chiefs of Staff. Joint Targeting…, C-7.
[9] United States, Joint Chiefs of Staff. Operation Assessment…, A-4.

Figure 1 - Joint Targeting Cycle (Dynamic and Deliberate)
Adapted from US Joint Publication 3-60

This paper will use MOP and MOE within the operation assessment methodology to assess the CAF's effectiveness compared to coalition partners during both operations. Indicators typically used to evaluate performance and effectiveness of achieving desired end states and objectives within each OE are useful, however also classified (ie. weapon effectiveness). The operational assessment will instead focus on evaluating the CAF performance and effectiveness to the coalition within each operation. Although targeting effectiveness on each OE is not being evaluated, it is important to consider each OE and its effects on the targeting process. The OE of each operation will be considered followed by the targeting capabilities applied with respect to the Joint Air Task Cycle (figure 3), and finally focus on Royal Canadian Air Force (RCAF) combat capabilities. Although not specific to targeting, these three areas will provide context to the MOP and MOE for comparative analysis.

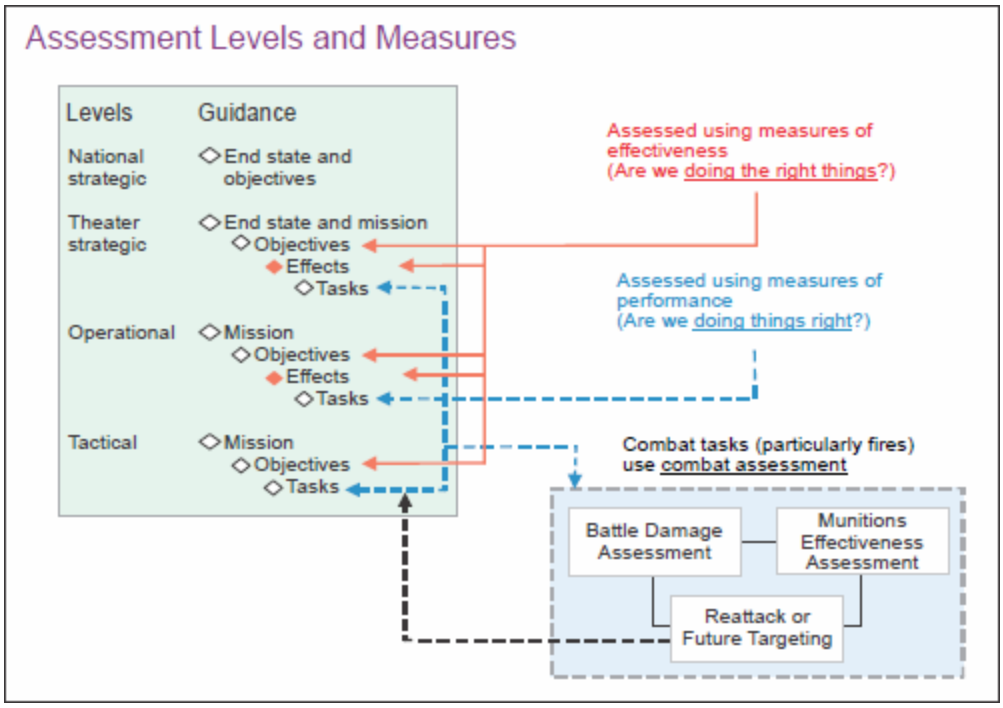

Figure 2 - Assessment levels and measures
Source: US Joint Publication 3-60 Joint Targeting 2013, D-3.

The Joint Air Tasking Cycle depicted in figure 3 provides a framework for the efficient and effective employment of air capabilities.[10] Although this cycle is specific to the Combined Air Operations Center (CAOC) functions in the planning, coordination and execution of air operations, the Joint Targeting Cycle stages are incorporated in each stage. OP MOBILE and IMPACT both followed the Joint Air Task Cycle with air operations being directed at the CAOC.

[10] United States, Joint Chiefs of Staff. Joint Targeting…, B-5.

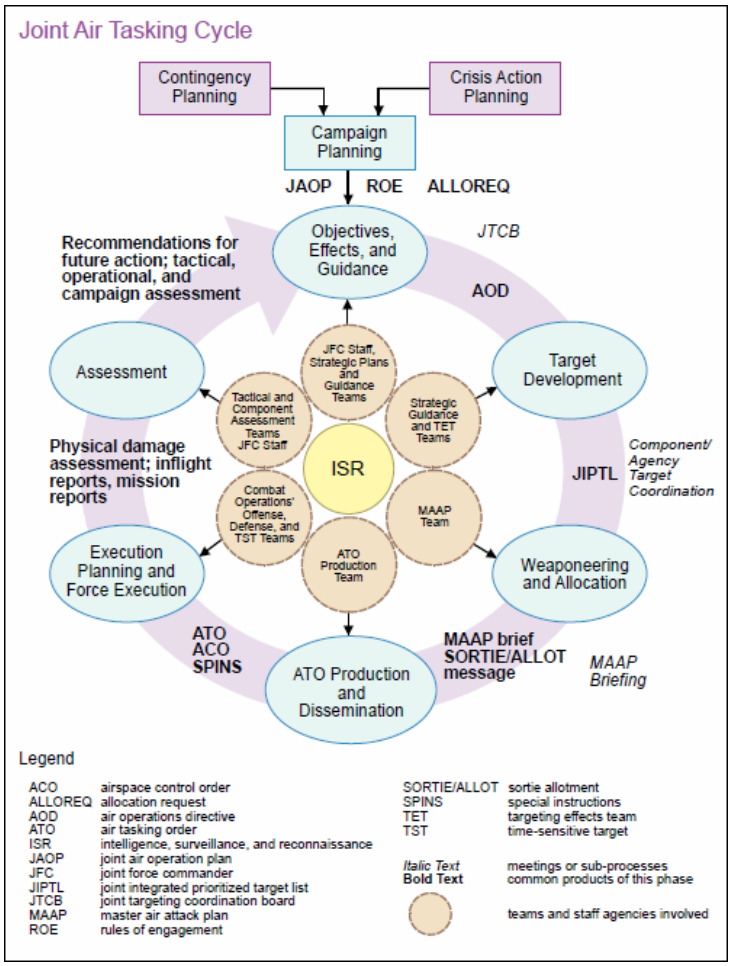

Figure 3 - Joint Air Tacking Cycle
Source: US Joint Publication 3-60 Joint Targeting 2013, C-3.

Targeting is command led and intelligence supported. As depicted in figure 2, intelligence, surveillance, and recognisance (ISR) is centrally located within the Joint Air Task Cycle, representative of its role in supporting all stages of this cycle. The second stage, target development, consists of vetting, validation, target list development, and nomination for prioritisation, synchronisation, and action. The third phase of this cycle is executed by the Master Air Attack Plan team and Target Effects Team. Capabilities analysis occurs during this stage and resources are allocated to targets. Weaponeering and collateral damage estimation (CDE) are conducted to various levels of refinement within these two stages. The execution phase of this

cycle, conducted by the Combat Operations Division, incorporates both the deliberate and dynamic targeting in addition to ongoing combat operations.[11]

Targeting decisions made within the CAOC on behalf of each coalition country is done via a Red Card Holder (RCH). The RCH is responsible for ensuring their nation's caveats and rules of engagement (ROE) are adhered to within the coalition.[12] The role, authority and responsibility of a RCH are nation specific and an important area that will be considered in this paper.

OPERATION MOBILE

In February 2011, the Arab Spring movement spread to Libya resulting in civil unrest when violence escalated between protestors and Pro-Gaddafi security forces. Alarmed by the deteriorating situation, the international community responded by adopting United Nations Security Council (UNSC) resolution 1973 on 17 March 2011, calling for states to establish a "no-fly zone" and to "take all necessary measures… to protect civilians and civilian population areas."[13] Two days later, the US initiated OOD.

On very short notice, seven CF-188s from 425 Squadron in Bagotville and two CC-150T aircraft from 437 Sqn Trenton deployed to Trapani, Italy. On 21 March, CF-188s conducted their first combat missions in support of OOD, the first since 1999 during Operation Allied Force (OAF) in Kosovo. OOD transitioned to OUP when North Atlantic Treaty Organisation (NATO) took control two weeks later under the command of Canadian Lieutenant-General Charles Bouchard.

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[11] *Ibid.*, B-5-7.

[12] This is based on the author's experience as the CAF RCH and Target Engagement Authority (TEA) during OP IMPACT from Oct 15 to Apr 16.

[13] Patricia A. Weitsman. "Operations Odyssey Dawn and Unified Protector." In *Waging War: Alliances, Coalitions, and Institutions of Interstate Violence* (Stanford: Stanford University Press, 2014), 164-165.

Operating Environment

Libya is twice as big as Afghanistan and 160 times larger than Kosovo, presenting several challenges. The operating environment will be discussed and characterised as partially contested and dynamic. The limited ground force integration and lack of ISR provided many challenges to the targeting process. When the mission transitioned to NATO, the CAOC was not prepared, and effectiveness suffered from inadequate targeting expertise and support.

It was clear from the beginning that the initial Libya campaign would require US command and control and unique strike capabilities. Planning for the Kosovo campaign took 15 months, OOD was planned in a matter of weeks. AFRICOM ran the campaign through the 603rd Air and Space Operations Center (AOC) in Ramstein. Within the first 24 hours, 22 of the 24 fixed Surface-to-Air Missile (SAM) sites had been destroyed by cruise missiles and stealth aircraft.[14] The remaining threat to coalition air operations was a small number of tactical SAMs, and a large number of man-portable SAMs and anti-aircraft artillery. Although mitigated US Suppression of Enemy Air Defence support,[15] the contested environment meant that fighter aircraft had to operate at higher altitudes, limiting their effectiveness of finding and identifying targets visually and with targeting pods.[16]

The situation on the ground was very dynamic. The lack of detailed ground integration drove the requirement for more ISR assets. Although some coalition partners employed military advisors and liaisons with the Anti-Gaddafi opposition forces, the deliberate target development process was hampered. Combined with the necessity to minimise collateral damage, the coalition

[14] Elizabeth Quintan, "A War from the Air", in *SHORT WAR, LONG SHADOW: The Political and Military Legacies of the 2011 Libya Campaign* (RUSI Publications, 16 Mar 2012), 31, 33.

[15] SA-6 Gainful, SA-8 Gecko, SA-9 Gaskin, and the French Crotale were still present. Source: Christina Goulter, "The British Experience: Operation Ellamy", in Karl P. Mueller, ed., *Precision and Purpose: Airpower in the Libyan Civil War* (Santa Monica, CA: RAND Corporation, 2015), 160.

[16] Based on the author's experience flying combat missions in Libya from Mar 11 to May 11.

had to employ more dynamic targeting in the form of Strike Coordination and Armed Reconnaissance (SCAR) missions.[17] Strike authority was delegated to the pilots whenever practicable…

> The discipline of OUP aircrew was commendable… Using a restricted fire line aided aircrews in knowing where within the ROE they could engage without [Combined Force Air Component] CFAC approval. Conversely, the CFAC had to approve targets on the restricted side of the restricted fire line. Whether aircrews or CFAC approved, due to the fluidity of the battlespace, limited ISR assets, and the strategic nature of every bomb, leadership and aircrews exhaustively weighed each engagement decision.[18]

The process of finding targets became more difficult as Gaddafi forces traded their readily identifiable military equipment and tanks for those similar to the opposition forces. The rebels began making the tops of their vehicles with an 'N' to avoid misidentification; however Gaddafi forces soon replicated this technique.[19] The opposition forces not only tried to adapt their strategies and movements to NATO's air campaign, but directly influence its targeting process. According to a RAND report,

> What is not widely known is that oppositionists across the country formed a complex network of spotters, informants, forward observers, and battle damage assessors. Anyone with a cell phone, Google Earth, Skype, Twitter, or email was in a position to report—and all of these conduits were used to pass coordinates, pictures, and other data. As the war progressed, the quality of the reporting improved. According to one Misratan observer, "First it was the general area, then GPS, and then Google Earth. I personally never reported anything unless I had someone put eyes on the target." The problem that mission planners faced, therefore, was not a shortage of targeting information, but a flood of it. The challenge was vetting the sources, corroborating the data with other collection platforms, transforming it into intelligence, and then determining what was actionable.[20]

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[17] Jason R. Greenleaf, "The Air War in Libya," *Air and Space Power Journal*, Vol 27. Issue 2 (March-April 2013): 32.

[18] Todd R. Phinney, "Reflections on Operation Unified Protector" *Joint Force Quarterly* 2nd Quarter 2014 (1 Apr 2014): 90.

[19] Frederic Wehrey, "The hidden story of airpower in Libya (and what it means for Syria)." Last modified 11 Feb 2013. http://foreignpolicy.com/2013/02/11/the-hidden-story-of-airpower-in-libya-and-what-it-means-for-syria/

[20] Frederic Wehrey, "The Libyan Experience", in Karl P. Mueller, ed., *Precision and Purpose: Airpower in the Libyan Civil War* (Santa Monica, CA: RAND Corporation, 2015), 61.

General Bouchard characterised the transition of OOD to the NATO structure as a "hail Mary pass" because of the rapid response required (just three weeks of planning) and skepticism about the chances for the success of such an undertaking.[21] The transition of the operation to NATO proved to be anything but smooth, "exposing fissures in the alliance and gaps in capabilities."[22] The CAOC in Poggio Renatico, Italy lacked adequate infrastructure and computer architecture to support the necessary staff and operations. Personnel assigned to the CAOC had little experience, training or qualifications in CAOC functions and required major augmentation, especially in targeting.[23]

Initially, all targeting was envisioned to be supported from Turkey, however this concept was abandoned after a few days when it was realised that two locations was unworkable.[24] Intelligence sharing and target development struggled as the NATO CAOC "lacked a functional ISR division"[25] and…

> At the core of this limitation is the fact that few countries had the national capability to collect intelligence, analyse it, share it on classified architecture, and then develop the high-fidelity targeting materials necessary for an aerial campaign where collateral damage is a concern.[26]

The solutions to the problems presented to operational planners required a divestment of targeting responsibilities to the pilots, thereby increasing operational efficacy and responsiveness.

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[21] Deborah C. Kidwell, "The U.S. Experience: Operational," in Karl P. Muller, "Examining the Air Campaign in Libya", in *Precision and Purpose: Airpower in the Libyan Civil War* (Santa Monica, CA: RAND Corporation, 2015), 136.
[22] Jason R. Greenleaf, "The Air War in Libya…, 37.
[23] *Ibid*., 39-40.
[24] Colonel Normand Gagne, CD, telephone conversation with author 18 April 2016.
[25] Todd R. Phinney, "Reflections on Operation Unified Protector"..., 89.
[26] *Ibid*., 88.

CAF Targeting Capabilities

The speed of the Libyan crisis and deployment of RCAF assets put tremendous pressure on the Canadian Expeditionary Force Command (CEFCOM), the predecessor to present Canadian Joint Operations Command (CJOC). Heavily occupied by years of land-centric operations in Afghanistan, there was little experience and expertise in air operations.[27] Although effects-based operations, predominantly an air-force concept, had gained much momentum and acceptance jointly following Kosovo, there was a lack of targeting capability and expertise within the CAF.[28] Despite the limited targeting capabilities, procedures, training, and limited command support, competent commanders and aircrew were able to make correct decisions and operate effectively because they were enabled by higher headquarters and given appropriate authorities.

The cadre of fighter pilots sent to the CAOC to perform RCH duties had received no prior training in targeting or CDE methodology. Targeting decisions were recorded by a log and deliberate pre-planned target packages consisted of imagery and a sheet with three sections for notes (Intelligence, LEGAD, and Ops). CEFCOM's initial lack of familiarity with the air operation resulted in limiting the authority of the Canadian RCHs. Col Gagne, one of the first deployed RCH described the deployment as "very challenging and highly rewarding" and credited direct communication with CEFCOM leadership as critical to building trust and confidence as the operation proceeded.[29] CF-188 pilot performance also built confidence as the operation progressed as…

[27] Colonel Normand Gagne, CD, telephone conversation with author 18 April 2016 and Colonel Eric Kenny, MSM, CD, telephone conversation with author 11 April 2016.

[28] Michael Clark, "The Making of Britain's Libya Strategy", in in *SHORT WAR, LONG SHADOW: The Political and Military Legacies of the 2011 Libya Campaign* (RUSI Publications, 16 Mar 2012), 25.

[29] Colonel Normand Gagne, CD, telephone conversation with author 18 April 2016.

> Public reports of CF-18s not dropping weapons due to collateral damage concerns confirmed that, in spite of low experience levels, Canadian aircrew were exercising a high degree of discretion and professionalism in a very sensitive operation.[30]

Intelligence and communication support to the RCH in Poggio was very limited. A robust intelligence team was deployed to Trapani with level three systems, however the detachment was unable to contribute to the targeting process. Eventually near the end of the operation, the badly needed communications and intelligence support was established in Poggio to aid in targeting.[31]

On a number of occasions, the RCHs attempted to get strike approval for targets that exceeded their delegated authority, with limited success. RCHs soon realised that calling back to Canada was not always feasible for dynamic situations. Eventually CEFCOM delegated more authorities to the deployed RCHs that increased their flexibility and effectiveness. One other distracting factor for the RCH was the implementation of the Air Task Force (ATF) concept. Initially, the RCH was dual-hatted as the ATF Commander. However, mid-way through the operation a separate ATF Commander was deployed to the CAOC.[32]

The pace of operations was very high. Colonel Kenny, the RCH near the end of the operation stated that "it was unusual for a day to go by without a strike." He also stated that even if they could effectively communicate with Canada, that "[CEFCOM] would have been significantly challenged to keep up with the pace of that operation." It was obvious that CEFCOM was satisfied with the state of operations or potentially distracted by Afghanistan as

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[30] Darcy E. Molstad, "CF-18s in Combat from Iraq to Libya: The Strategic Dividend of Fighters" Masters of Defence Studies Directed Research Project, Canadian Forces College, 2011, 73.

[31] Derek Joyce, End of Tour Report, Task Force Libeccio…, 5.

[32] Colonel Normand Gagne, CD, telephone conversation with author 18 April 2016 and Colonel Eric Kenny, MSM, CD, telephone conversation with author 11 April 2016.

Colonel Kenney stated that "sometimes we were wondering if they were even paying attention" and in retrospect, he "felt that some additional oversight would have been nice."[33]

RCAF Air Power Capabilities

RCAF airpower proved very effective by professional aircrews despite having some capability deficiencies (weapons and CP-140 capabilities). The CF-188 had undergone a major modernisation since last used in combat during the Kosovo campaign with the most important and applicable upgrade being the Snipper XR targeting pod. Delays in acquiring the GBU-49 (GPS and Laser-guided weapon) in time for the operation resulted in the RCAF very quickly acquiring and fielding the GPS-guided GBU-31 and 38 Joint Direct Attack Munitions (JDAM) in time for the end of the operation.

Although the CF-188 performed superbly, the lack of a low collateral damage and direct attack munitions limited its effectiveness against certain targets. There was limited success employing laser-guided bombs against tanks and the potential for collateral damage precluded striking other targets. The lack of the BRU-55 bomb rack limited the CF-188 to one Precision-Guided Munitions (PGM) per weapons station.[34]

The Block II CP-140 was equipped with the electro-optical/infrared MX-20 and deployable mission support centre proved effective however, without a Beyond-line-of-sight (BLOS) capability, data could not be shared in real-time.[35] The Block II variant also lacked a self-defence suite that restricted employment to 'wet feet' until the environment became more permissive.

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[33] Colonel Eric Kenny, MSM, CD, telephone conversation with author 11 April 2016.

[34] CF-188s were mostly configured with three external tanks leaving two weapon stations free (author's experience in OP MOBILE).

[35] Daniel Arsenault and Josh Christianson, "Punching Above Its Weight" *Royal Canadian Air Force Journal* vol. 1 no. 3 (Summer 2012): 29-30.

The CP-140 contributed critically required ISR and transitioned to the new role of SCAR. The successful accomplishment of this new skill, aided with embedded Joint Terminal Attack Controllers (JTACs) is a testament of the crew's professionalism and flexibility; however the lack of self-protection, Digitally-aided Close Air Support equipment, Link 16 and target marking capability degraded SCAR effectiveness.[36]

Measures of Performance and Effectiveness

The CAF's performance in OP MOBILE was exceptional given the limitations and restraints in the operating environment, targeting capabilities and air power limitations. One of six countries agreeing to conduct offensive strikes, CF-188 flew 944 sorties over 3882 hours and expended 696 PGMs accounting for approximately 10% of all strikes (OUP total 9646 sorties and 7642 munitions).[37]

The coalition achieved a weapon per sortie (wpn/sortie) rate of 0.79 on average. The CAF achieved a rate of 0.74 wpn/sortie or 5.6 flight hours per weapon expended (hrs/wpn). Despite not having low collateral damage weapons or JDAMs, the CAF achieved similar effectiveness rates as other countries with these capabilities such as Belgium (0.76 wpn/sortie, 5.5 hrs/wpn) and Denmark (0.72 wpn/sortie, 5.1 hr/wpn).[38] As a result of OP MOBILE, several lessons were identified specific to targeting, primarily the requirement to institutionalise the capability in terms of doctrine, training and command support.[39]

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[36] Alan Lockerby, "SCAR-C Over Libya: To War in an Aurora." *Canadian Military Journal* vol. 12 no. 3 (Summer 2012): 66.

[37] Derek Joyce, End of Tour Report..., 1 and Karl P. Muller, "Examining the Air Campaign"…, 4.

[38] Christian F. Anrig, "The Belgian, Danish, Dutch, and Norwegian Experiences", in Karl P. Muller, "Examining the Air Campaign in Libya", in *Precision and Purpose: Airpower in the Libyan Civil War* (Santa Monica, CA: RAND Corporation, 2015), 301.

[39] Derek Joyce, End of Tour Report, Task Force Libeccio (Canada: file 1630-1 (Comd TF LIB), 7 Nov 2011).

	Operation Mobile	Operation Impact
Operating Environment	Partially Contested and dynamic environment Limited ground force / SOF integration Insufficient ISR and AAR assets Limited expertise and support in newly NATO adopted CDE methodology CAOC very limited in capabilities and support	Permissive and fairly static environment Ground Forces providing intel Sufficient ISR assets Robust CAOC capabilities, support and targeting expertise
CAF Targeting Capabilities	CEFCOM's primary mission focus is Afghanistan Non-existent targeting capabilities , procedures and training Very limited secure comms and command support	CJOC's primary mission Limited targeting capabilities and training Targeting directives Some secure comms and command support capabilities
RCAF Air Power Capabilities	CF-188 modernization with robust capabilities LGB's are only PGM No IAM, FMT, direct fire ASM, low collateral damage wpn capabilities Limited 1 PGM per wpn station CP-140 has MX-20 EO/IR and L-11 No APS-508 Imaging Radar, ALQ-507 ESM, L-16 BLOS, DIRCM (self-protection) LTD/IR Marker	CF-188 enhanced self-protection EPW II and JDAM BRU-55 doubles CF-188's carrying capacity of some PGMs No FMT, direct fire ASM, low collateral damage wpn capabilities CP-140 modernization adds many capabilities and iBLOS Bk IV – BLOS, WGS, Link 16, DIRCM (self-protection) LTD/IR Marker
MOP	**Strike Missions** **OD/OUP** flew 9646 sorties, expended 7642 munitions **RCAF** flew 944 sorties, 3882 hrs, expended 696 munitions RCAF accounted for approximately 10% of all strikes 660 of 944 strikes were dynamic (70%)	**Strike Missions** (30 Oct 14 to 15 Feb 16) **OIR** flew 28283 sorties, expended 36769 munitions Target Types: 31% fighting positions, 30% other, 26% buildings, 5% oil infrastructure, 5% staging areas **RCAF** flew 1378 sorties, 5512 hrs, expended 606 munitions RCAF accounted for approximately 2% of all strikes Target Types: 71% fighting positions, 8% buildings, 8% other, 6% vehicles
MOE	**OD/OUP** 0.79 wpn/sortie **RCAF** 0.74 wpn/sortie, 5.6 hrs/wpn **Belgium** 0.76 wpn/sortie, 5.5 hrs/wpn **Denmark** 0.72 wpn/sortie, 5.1 hrs/wpn **Norway** 0.96 wpn/sortie, 5.3 hrs/wpn	**OIR** 1.3 wpn/sortie **RCAF** 0.44 wpn/sortie, 9.1 hrs/wpn **Australia** 0.74 wpn/sortie, 10.3 hrs/wpn, 7.6 hrs/wpn corrected for 468 nm distance from Al Minhad Air Base to Al Jaber (2 hrs transit/sortie further than CAF)
Targeting Lessons Identified	Callback to CEFCOM for targeting approval not feasible ATF construct was not fully implemented and distracted RCH Lack of RCH training LGB buddy laze procedures with other assets JDAM and BRU-55	

ASM – Air-to-Surface Missile ATF – Air Task Force BLOS – Beyond Line of Sight capability to transmit mission data (including full motion video) CAOC – Combined Air Operations Center CEFCOM – Canada Expeditionary Force Command CJOC – Canadian Joint Operational Command DIRCM – Directional Infrared Countermeasures	EPW II – Enhanced Paveway II, GBU-49 is a dual-mode PGM both laser and GPS guided ESM – Electronic Support Measures (Radar Warning System /SIGINT) IAM – Inertial-aided munition (ie. GBU-38) iBLOS – Interim BLOS ISR – Intelligence, Surveillance and Reconnaissance FMT – Fast Moving Target	JDAM – Joint direct attack munition (IAM with GPS guidance ie. GBU-38) LGB – Laser-guided bomb (ie. GBU-12) LTD/IR – Laser Tracking Device and Infrared marker MX-20 EO/IR is an electro-optical/infrared sensor PGM – Precision-guided munition RCH – Red Card Holder WGS – World Geodetic System (reference coordinate system)

Table 1- Comparison between OP MOBILE and OP IMPACT
Sources: Derek Joyce, End of Tour Report, Task Force Libeccio (Canada: file 1630-1 (Comd TF LIB), 7 Nov 2011), Karl P. Muller, "Examining the Air Campaign in Libya", in Precision and Purpose: Airpower in the Libyan Civil War (Santa Monica, CA: RAND Corporation, 2015), National Defence and the Canadian Armed Forces, "Operation IMPACT – Air Task Force-Iraq airstrikes," accessed 1 April 2016, http://www.forces.gc.ca/en/operations-abroad-current/op-IMPACT-airstrikes.page, US Department of Defense, "Operation Inherent Resolve," accessed 1 April 2016, http://www.defense.gov/News/Special-Reports/0814_Inherent-Resolve, and Australian Government – Department of Defence, "Air Task Group," accessed 1 April 2016, http://www.defence.gov.au/Operations/Okra/atg.asp

OPERATION IMPACT

In 2014, the Islamic State of Iraq and the Levant's (ISIL)[40] rapid advance across Iraq and Syria and the ineffectiveness of Iraqi Security Forces (ISF) in stopping them caught the international community off guard. ISIL's brutal actions of converting or killing non-Sunni populations in its goal of establishing an Islamic caliphate have displaced millions in the region and threatened regional and international security. On 7 August 2014, President Barack Obama authorised targeted military intervention in Iraq to halt the advance of and degrade ISIL.

Op IMPACT initially included the deployment of six CF-188s and two CP-140 aircraft to support the US-led coalition by conducting airstrikes in Iraq and Syria from 30 October 2014 to 15 February 2016.[41] Unlike OP MOBILE, the deployment of CAF assets into theatre was well paced and deliberate. The RCAF ATF construct was more mature and the ATF Commander was separated from the targeting process as learned following the Libya operation.[42]

Operating Environment

During the period that the CAF was conducting airstrikes, the operating environment for air operations in Iraq and Syria can be characterised as permissive and fairly static in terms of ground operations. Coalition joint fires and ISF/Peshmerga security force integration was well established and there was an abundance of ISR assets. Air operations were controlled via US Air forces Central Command (USAFCENT) in Shaw AFB, SC and the 609th CAOC in Al Udeid Air Base, Qatar. USAFCENT had robust targeting capabilities, ISR division and command support.[43]

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[40] ISIL is also known as the Islamic State of Iraq and Syria (ISIS), the Islamic State (IS), and Daesh.

[41] National Defence and the Canadian Armed Forces, "Operation IMPACT – Air Task Force-Iraq airstrikes," accessed 1 April 2016, http://www.forces.gc.ca/en/operations-abroad-current/op-IMPACT-airstrikes.page

[42] Lieutenant-Colonel William Radiff, CD, telephone conversation with author 11 April 2016.

[43] US Air Forces Central Command, "Ground to Air: The Unseen Link," accessed 8 May 2016, http://www.afcent.af.mil/News/ArticleDisplay/tabid/4779/Article/749596/ground-to-air-the-unseen-link.aspx

In terms of air threat to coalition operations, ISIL's capabilities were limited.[44] Syrian pro-government forces had an established air defence system, however employed it passively, never attempting to interfere with coalition operations. On 30 September 2015, Russian forces deployed to Syria to support Bashar al-Assad's government. The US chose not to cooperate with Russian forces, but rather de-conflict from them and establish a memorandum of understanding. [45]

The coalition was successful in initially stopping ISIL's advance across Iraq in Syria, allowing ISF and Peshmerga security forces time to regroup and build capacity. By the end of OP IMPACT, the Peshmerga had made advances towards the ISIL-held city of Mosul and ISF had made gains in Ramadi and SW Iraq, figure 4 represents ISIL-controlled areas roughly during OP IMPACT timeframe. Coalition advisors, including CAF Special Operating Forces aiding Peshmerga Forces in Erbil, improved coalition understanding of the ground situation and coordination of joint fires.[46]

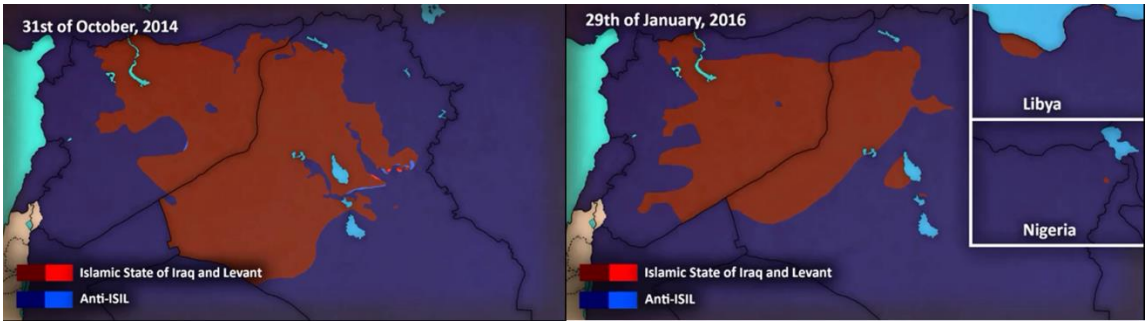

Figure 4 – ISIL approximate area of control map. Interactive map available: https://isis.liveuamap.com/
Source: http://foxtrotalpha.jalopnik.com/this-animated-map-of-isis-expansion-in-syria-iraq-and-1756464711

[44] Based on author's experience as Canadian TEA during OP IMPACT from Oct 15 to Apr 16.
[45] US Department of Defense, "Department of Defense Press Briefing by Col. Warren via Teleconference from Baghdad, Iraq," accessed 8 May 2016, http://www.defense.gov/News/News-Transcripts/Transcript-View/Article/632421/department-of-defense-press-briefing-by-col-warren-via-teleconference-from-bagh
[46] National Defence and the Canadian Armed Forces, "Operation IMPACT," accessed 8 May 2016, http://www.forces.gc.ca/en/operations-abroad-current/op-IMPACT.page

From the commencement of operations until the end of 2015, the coalition had conducted 11,648 ISR sorties in comparison to 27,704 strike sorties.[47] These ISR assets were effectively controlled and coordinated by a robust and capable CAOC in Al Udeid with support from USAFCENT in Shaw, SC. The large number of ISR assets allowed the coalition to develop targets and support ground operations much more effectively than possible with the limited ISR and ground integration during OUP.

Targeting Capabilities

In the years following OP MOBILE, the CAF had made concerted efforts to institutionalise targeting by establishing a strategic working group and J3 targeting cell within CJOC. Progress in the development of a Strategic Targeting Directive (STD) and targeting training was fairly complete prior to OP IMPACT, however continued to evolve during the operation as this capability continues to develop.[48]

Although CAF has ceased its kinetic air mission in Iraq, OIR is an ongoing operation and limits the level of detail that can be discussed. Therefore targeting will be discussed doctrinally with the understanding that operations will deviate and adapt to the requirement of the OE. In an air operation, all joint fires are approved by the Target Engagement Authority (TEA) and coordinated with ground forces via JTACs and Tactical Control Air Parties within Fires cells of ground units.[49] In OIR, joint fires are coordinated with ISF, tribal and Peshmerga forces by embedding specially trained advisors,

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[47] US Department of Defense, "Combined Forces Air Component Commander 2011-2016 Airpower Statistics," accessed 6 May 2016, http://www.defense.gov/Portals/1/features/2014/0814_iraq/docs/March_2016_Airpower_Summary.pdf

[48] Based on author's experience as Officer Commanding Air-Land Integration Cell 2012-2015 and Canadian TEA for OP IMPACT from Oct 15 to Apr 16.

[49] United States, Joint Chiefs of Staff. Joint Fire Support. Joint Publication 3-09. Washington, D.C.: Joint Chiefs of Staff, 2014, I-3,4.

> U.S. advisors have been embedded in various Iraqi headquarters in an effort to identify requirements for air support and pass them to the Combined Air Operations Center (CAOC) in Qatar, which is overseeing the air campaign.[50]

For non-US aircraft, the additional strike approval step of RCH approval is required for all strikes (deliberate, dynamic or CAS). Although the coalition uses the RCH term, the CAF opted to replace the term with Target Engagement Authority (TEA) within CAF targeting policy. The CAF TEA team comprised of a TEA supported by a LEGAD and an Intelligence Officer.[51]

The Canadian TEA team that deployed initially to OP IMPACT received limited training with CJOC staff, subject matter experts and former RCHs. Although there were 'growing pains' with the newly drafted targeting directives, the TEA team was more prepared than their counterparts in OP MOBILE. Similarly to OP MOBILE, targeting authorities of the TEA were initially limited. During the course of the deployment it became obvious to the TEA team that the imposed limitations were unfavorable to their effective execution and lobbied on several occasions for clarification of targeting directives, ROE, and requested changes to targeting authorities as their understanding of the operation developed. Along with the targeting directives came an extensive target reporting system absent from OP MOBILE. Although necessary for accountability, there was duplication of information between coalition targeting packages, the Target Summary Sheet completed by the TEA and separate LEGAD reporting. CJOC staff had more targeting expertise than during OP MOBILE, however limited organic air operations and fighter expertise.[52]

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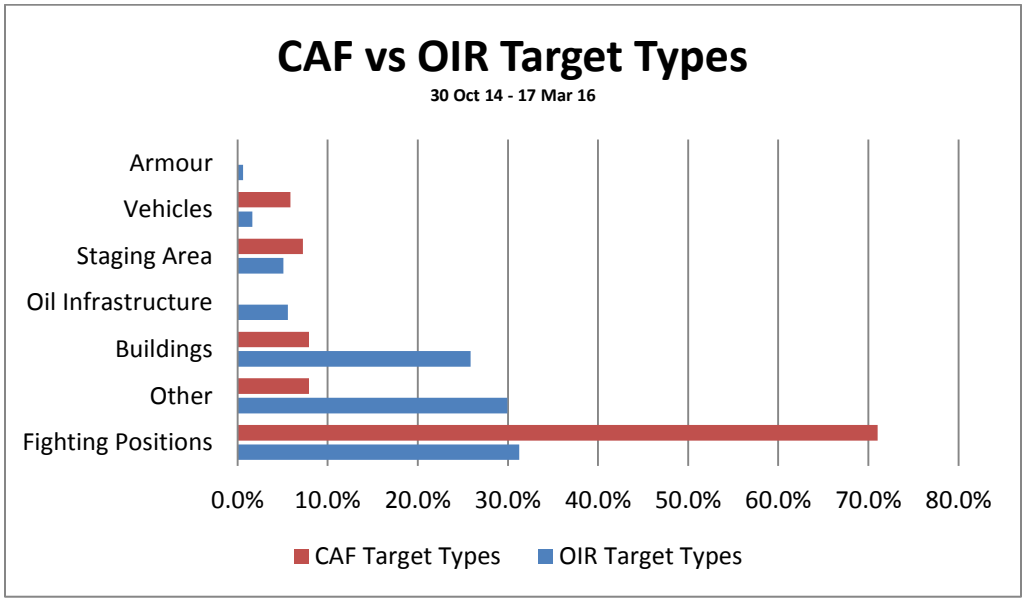
[50] The Washington Institute, "Operation Inherent Resolve: An Interim Assessment," accessed 9 May 2016, http://www.washingtoninstitute.org/policy-analysis/view/operation-inherent-resolve-an-interim-assessment

[51] Based on author's experience as Canadian TEA for OP IMPACT from Oct 15 to Apr 16 and CBCNews, "Exclusive: Inside Canada's bombing bureaucracy," accessed 15 Mar 2015, http://www.cbc.ca/news/politics/cf18-bombing-forms-milewski-1.3476675

[52] Lieutenant-Colonel William Radiff, CD, telephone conversation with author 11 April 2016.

The lesson from OP MOBILE in separating the ATF Commander and TEA was implemented; however the ATF and Joint Task Force (JTF) commanders were not located in the CAOC. This resulted in the two TEA's being the most senior CAF OP IMPACT representatives within the CAOC, a Lieutenant-Colonel and Major. Visa difficulties, working space, and sustainment of senior officers were reasons cited for not placing a higher ranked officer in the CAOC; however consideration should be made for future air operations as significant high level discussions about coalition air operations are made in the CAOC.[53]

As with OP MOBILE, each TEA described the challenges in getting approval when the target or ROE did not fall within their authority, especially dynamically. This resulted in passing on several targets, or waiting until the situation became desperate that the strike could be conducted under self-defence. A cursory look at the types of targets CAF struck compared to the coalition in figure 5 shows that most strikes were against targets associated with combat engagement (CAS) where self-defence situations would be likely.[54]



[53] Colonel Normand Gagne, CD, telephone conversation with author 18 April 2016 and Colonel Eric Kenny, MSM CD, telephone conversation with author 11 April 2016, and Lieutenant-Colonel Sean Doell, CD, telephone conversation with author 11 April 2016.

[54] Based on author's experience as Canadian TEA in OP IMPACT from Oct 15 to Apr 16.

Figure 5 - CAF vs OIR Target Types
Source: National Defence and the Canadian Armed Forces, "Operation IMPACT – Air Task Force-Iraq airstrikes," accessed 1 April 2016, http://www.forces.gc.ca/en/operations-abroad-current/op-IMPACT-airstrikes.page, US Department of Defense, "Operation Inherent Resolve – Airpower Summary," accessed 1 April 2016, http://www.defense.gov/News/Special-Reports/0814_Inherent-Resolve

During OP MOBILE, each RCH interviewed described infrequent occasions when the LEGAD and RCH disagreed on a validity of a target and the RCH made an operational decision based on his best judgment under the authority delegated as a military commander.[55] Without going into specifics, the freedom of an OP IMPACT TEA to make a military decision outside of the consensus of the entire TEA team was limited, resulting in a policy of decision by committee.[56]

On the few occasions where the TEA could consult CJOC for strike approval, it was questionable what added benefit in terms of decision making support was gained. The CJOC team's unfamiliarity with the current ground situation, complicated and changing targeting directives, air weapons effects, and CDE methodology often led to long discussions with the TEA explaining in layman terms complex factors. It would be disingenuous to criticise the intentions or professionalism of the CJOC staff, however they did not have access to all of the expertise, resources and information nascent within the COAC.[57]

RCAF Air Power Capabilities

Since OP MOBILE, the CF-188 had improved capabilities in both self-protection and weapons with the introduction of the GBU-49 and BRU-55 bomb rack. Despite lacking a direct fire capability and low collateral damage weapons, the CF-188 was well suited for the operation

[55] Colonel Normand Gagne, CD, telephone conversation with author 18 April 2016, Colonel Eric Kenny, MSM CD, telephone conversation with author 11 April 2016, and Lieutenant-Colonel Jeffery Lebouthiller, CD, telephone conversation with author 15 April 2016.

[56] Based on author's experience as Canadian TEA during OP IMPACT from Oct 15 to Apr 16.

[57] Lieutenant-Colonel William Radiff, CD, telephone conversation with author 11 April 2016, Lieutenant-Colonel Jean-Paul Peart, CD, telephone conversation with author 14 April 2016, and author's experience as TEA during OP IMPACT.

and more capable in terms of weapon payload, guidance and fusing options allowing flexibility against a greater range of targets. The Block III CP-140 modernisation was a more extensive improvement in ISR capabilities, adding an interim-BLOS capability that allowed ISR integration with the CAOC.[58]

Measures of Performance and Effectiveness

It would be expected that CAF performance and effectiveness would improve or at a minimum be on par with the coalition given the contrast in limitations and restraints in the OE, targeting capabilities and air power capabilities from OP MOBILE to IMPACT; however that was not the case. CF-188 flew 1378 sorties, 5512 hours and expended 606 munitions accounting for approximately 2% of all strikes (OIR total 28283 sorties, 36769 munitions).[59]

The coalition achieved a 1.3 wpn/sortie. The CAF's rate of 0.44 wpn/sortie, 9.1 hrs/wpn was significantly less and half as effective as it was during OP MOBILE. Direct comparison of these generic statistics with the coalition is problematic because some capabilities are not comparable. For instance, UAVs with long loiter time and low collateral damage weapons have more employment opportunities; as well, approximately seven B-1B bombers are capable of delivering the same amount of ordnance that was employed by the CAF during the entire operation.[60] However, examining the Royal Australia Air Force (RAAF) statistics is worthwhile for comparison. Matched with very similar capabilities and targeting directives as the CAF, the RAAF achieved a 0.74 wpn/sortie rate and 10.3 hrs/wpn or 7.6 hrs/wpn corrected for 468 nm

[58] D.L.R. Wheeler, 1 Canadian Air Division (1 CAD) Intelligence, Surveillance and Reconnaissance (ISR) Directive – Spiral One. Canadian Forces Base Winnipeg: file 2000-0 (A2), 19 Jan 16: B-4.

[59] National Defence and the Canadian Armed Forces, "Operation IMPACT – Air Task Force-Iraq airstrikes," accessed 1 April 2016, http://www.forces.gc.ca/en/operations-abroad-current/op-IMPACT-airstrikes.page and US Department of Defense, "Operation Inherent Resolve," accessed 1 April 2016, http://www.defense.gov/News/Special-Reports/0814_Inherent-Resolve

[60] US Air Force, "B-1B Lancer: Fact Sheet," accessed 4 May 16, http://www.af.mil/AboutUs/FactSheets/Display/tabid/224/Article/104500/b-1b-lancer.aspx

distance from Al Minhad Air Base to Al Jaber (2 hrs transit/sortie further than CAF).[61] It is fully acknowledged that a greater detail of analysis for this discrepancy may offer other explanations, however the most obvious seems to be targeting authority.

EFFECTIVNESS OF AIR POWER TARGETING AND EMPLOYMENT

Talent and genius operate outside the rules, and theory conflicts with practice.

- Carl von Clausewitz, On War

Targeting must be command led by competent leaders empowered with the appropriate level of authority and responsibility to be effective. Air power must be given an appropriate level of flexibility in tactical execution to take advantage of its fullest capabilities. These two factors are the primary reasons why the CAF was less effective targeting with air power during OP IMPACT and can first be illustrated using the Pigeau and McCann Competency, Authority, and Responsibility (CAR) Model of Command. The balanced command envelope shows that during the later stages of OP MOBILE, targeting policies placed the RCHs and aircrew inside balanced command, while policies during OP IMPACT placed the TEA's in the region of ineffective command and overall effectiveness suffered.

The Competency dimension of Pigeau and McCann's CAR model can be adapted to evaluate the RCH or TEA's ability to make competent decision based on their working environment and available resources.[62] The competencies of the RCHs and TEAs are similar in terms of experience and knowledge of fighter operations. However, the TEAs deployed in OP IMPACT have an advantage in additional training and availability to more resources in terms of intelligence and targeting support from the robust and capable CAOC. Highly integrated with

[61] Australian Government – Department of Defence, "Air Task Group," accessed 1 April 2016, http://www.defence.gov.au/Operations/Okra/atg.asp

[62] Ross Pigeau and Carol McCann. "Re-conceptualizing command and control." *Canadian Military Journal* 3, no. 1 (Spring 2002): 57-58.

friendly ground forces and an abundance of ISR assets ensured the TEAs in OP IMPACT were in a good position to make competent decisions.

Pigeau and McCann describe authority as a command's domain of influence; the degree to which a Commander is empowered to act.[63] TEAs in OP IMPACT did not have as much authority as the RCHs in OP MOBILE or many of the other RCHs of the coalition in Iraq. There are two arguments made by CJOC Chief of Joint Targeting and Effects for this reason: The first being that the authority level was commensurate with appropriate risk against collateral damage and civilian casualties (CIVCAS). The second, OP MOBILE was commanded by a Canadian Commander, and as such, his authority in directing targeting was deemed appropriate such that air power could take more of an execution mindset.[64]

OOD/OUP "designed a 'zero CIVCAS' framework that translated into the highest level of protection of civilians, property, and civilian infrastructure,"[65] was the first air operation to use 100% PGM.[66] USAFCENT Commander, Lt. Gen. Charles Brown, has stated that OIR is the "most precise air campaign in history."[67] An interim OIR report from the Washington Institute dated 13 January 2015 speaks to the importance of restraint on the cohesion of the coalition:

> The manner in which the campaign has been conducted has also been important. Coalition air operations have been carried out with an extremely high degree of precision and restraint. Thus far, reliable claims of civilian casualties -- approximately fifty each in Iraq and Syria -- are very low considering the number of weapons delivered…This restraint has likely decreased the damage inflicted on ISIS, but it has also paid huge dividends in assembling a broad coalition.[68]

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[63] Ross Pigeau and Carol McCann. "Re-conceptualizing…, 58-59.

[64] Lieutenant-Colonel Jay MacKeen, MSM, CD, telephone conversation with author 9 May 2016,

[65] Gregory Alegi, "The Italian Experience: Pivotal and Underestimated", in Karl P. Mueller, ed., *Precision and Purpose: Airpower in the Libyan Civil War* (Santa Monica, CA: RAND Corporation, 2015), 219.

[66] Karl P. Muller, "Examining the Air Campaign…, 4.

[67] US Air Forces Central Command, "General: Airpower key to ISIL fight; strikes to continue," accessed 9 May 2016, http://www.afcent.af.mil/News/ArticleDisplay/tabid/4779/Article/658205/general-airpower-key-to-isil-fight-strikes-to-continue.aspx

[68] The Washington Institute, "Operation Inherent Resolve: An Interim Assessment," accessed 9 May 2016, http://www.washingtoninstitute.org/policy-analysis/view/operation-inherent-resolve-an-interim-assessment

The importance of CIVCAS and collateral damage avoidance was equal for both operations and all targeting decisions made in OIR have this in mind. It would not be in the best interest of the US to put a coalition member in a possible CIVCAS situation as it would threaten the coalition cohesion. Implementing restrictive CAF targeting policies to mitigate risk against a zero CIVCAS framework is unnecessarily restrictive and impacts effectiveness as shown by the poor wpn/sortie ration. The very low number of CIVCAS occasions by a coalition that employed 60 times more ordnance speaks to the effectiveness of the existing framework. CIVCAS can never be fully mitigated in an operation like OIR and it is impossible to measure how many instances of CIVCAS were avoided by more restrictions; however weapon employment rates and credibility are the casualties of caveats. Further, restricting strike authority until ground forces are put in a dangerous situation where self-defence ROE can be employed is a bad policy.

The suggestion that Lieutenant-General Bouchard was making decisions for Canadian targeting is flawed because he was acting as the NATO Commander. It may have been convenient that he was Canadian, however to imply that he was personally validating all targets is disingenuous and the reason the CAF deployed RCHs.

The CAR model divides responsibility into two parts; extrinsic and intrinsic. Extrinsic responsibility is associated with personal and legal authority and is the degree to which an individual feels accountable up and down the chain of command while intrinsic responsibility, simply stated, is a function of resolve and motivation.[69] RCHs and TEAs both had an extraordinary level of responsibility authorising airstrikes on behalf of the government of Canada.

The Pigeau and McCann CAR model can be expressed in three dimensional space to represent the region of balanced command as shown in figure 6. The red star represents the

[69] Ross Pigeau and Carol McCann. “Re-conceptualizing…, 58-59.

region of command RCHs achieved near the end of OP MOBILE. It shows that they had the appropriate amount of authority and responsibility commensurate with their high level of competency. The second outlined star represents the command assessment of the TEAs during OP IMPACT. It shows that the lower level of authority put them in the region of command that Pigeau and Ross describe as ineffective command.

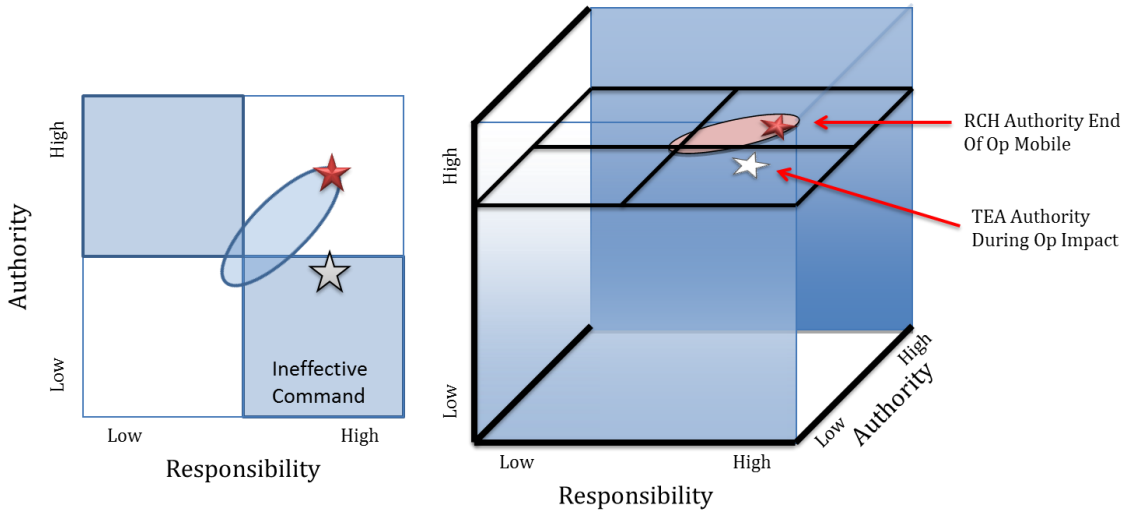

Figure 6 - CAR representation of RCH and TEA during OP MOBILE and OP IMPACT Adopted from: Ross Pigeau and Carol McCann. "Re-conceptualizing command and control." Canadian Military Journal 3, no. 1 (Spring 2002).

The second reason why targeting effectiveness impaired combat execution was because a targeting process rather than a doctrinal Joint Fire Support (JFS) construct was used to conduct CAS by non-US nations. This presents a difficult problem as there are a number of good reasons why this was appropriate for the OE, however it is important to understand the consequences of this construct in future air operations or if the OE changes. First the context of what is meant by targeting and its role in supporting joint fires will be discussed. Targeting in its simplest form is a

selection process. Doctrine defines Joint targeting as "a fundamental task of the fires function,"[70] its purpose is to…

> integrate and synchronize fires into joint operations. Targeting is the process of selecting and prioritizing targets and matching the appropriate response to them, considering operational requirements and capabilities. Targeting also supports the process of linking the desired effects of fires to actions and tasks at the joint force component level.[71]

Although intrinsically linked to joint fires, targeting is a separate task that enables joint fires through the selection of targets, and matching of capabilities to achieve desire effects. Targeting doctrine conveniently categorises targeting as deliberate or dynamic based on time and necessity to act, however excluded from this process but in the spectrum of necessity to act with force is combat engagement and self-defence.[72] An effective joint fires and JFS system is intrinsic to joint combat operations.[73]

CAS, the predominant mission, was executed as dynamic targeting during OIF for coalition aircraft. The RCH or TEAs would receive a brief by a fires team under the authority of a US TEA to strike a target and authorise a strike if it met national caveats. However, CAS is not found on the Joint Targeting Cycle in figure 1 because it is combat engagement and part of the JFS system in order to support the ground commander's intent. OIR is unique because the OE is permissive and static, comms with the CAOC and fires cell is very effective, and most importantly, there are no coalition troops in harm's way. It would not appropriate from a risk mitigation point of view to delegate CAF CAS strike approval to the cockpit given these factors, however this would be different under other circumstances. The key takeaway is that CAS is not

[70] United States, Joint Chiefs of Staff. Joint Targeting…, vii.
[71] *Ibid.*, vii.
[72] *Ibid.*, viii.
[73] Joint fires can be both lethal and non-lethal. JFS implies the use of joint fires to support manoeuvre elements. The effective integration of joint fires relies on a robust system using interoperable network architecture, standard operating procedures, and extensive joint training.

‘normally’ part of targeting and future planners and commanders should understand that deviating from doctrine will effect tactical execution.

CONCLUSION

Operational assessment of targeting with air power during OP MOBILE and OP IMPACT has demonstrated how important targeting policies and doctrine are to effectively achieve desired effects. Lessons in targeting during OP MOBILE resulted in significant efforts to develop targeting capabilities. Although originating from the well intentioned desire to adopt a linear, accountable and systematic decision making process to manage risk; the unintended result established during OP IMPACT was a restrictive system encumbered by a bureaucratic process that promoted ineffective command as described by the Pigeau and Ross balanced command envelope. Executing CAS via a dynamic targeting process rather than as combat engagement within the JFS doctrine introduces inefficiencies, however depending on the OE, is sometimes appropriate. These policies had ripple effects down to tactical execution of air power and directly impacted combat effectiveness in achieving desired effects. Excess caveats in a mitigated framework unnecessarily degrade effectiveness and credibility. Targeting must be command led by competent leaders empowered with the appropriate level of authority and responsibility to be effective. Air power must be given an appropriate level of flexibility in tactical execution to take advantage of its fullest capabilities provided that the OE is properly evaluated in terms of risk versus effectiveness.

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View/Article/632421/department-of-defense-press-briefing-by-col-warren-via-teleconference-from-bagh

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