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## CFS ALERT SUSTAINMENT RECOMMENDATIONS

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## CFS ALERT SUSTAINMENT RECOMMENDATIONS

### AIM

1. Due to the Yearly Flying Rate (YFR), Person Years (PY), and monetary costs associated with sustainment operations for CFS Alert, this paper will examine alternatives to the current method of resupply with the aim of cost reduction for the RCAF in the near-term.

### INTRODUCTION

2. Sustain is the function regenerates and maintains capabilities in support of operations. It is composed of four separate components; personnel, materiel, infrastructure, and services that need to be provided for all aerospace operations to maintain both effectiveness and aerospace power. In the case of Canadian Forces Station (CFS) Alert, the sustain function is focused on two separate periods throughout the year called Operation BOXTOP (Op BOXTOP).<sup>1</sup>

3. The importance of Op BOXTOP speaks directly to the Sustain function and is the primary source of fuel and logistics re-supply to both Canadian Forces Station (CFS) Alert and Fort Eureka each year. Fort Eureka is the satellite uplink facility located on the west side of Ellesmere Island at one end of the 400 km-long High Arctic Data Collection System; the satellite and microwave link for all communications from CFS Alert.

4. Op BOXTOP is conducted over two separate periods, one in April/May and one in September/October. Each operation is planned for approximately 3 weeks of flights based out of Thule Air Base (AB), Greenland and CFS Alert (for Ultra-Low Sulphur Diesel (ULSD) from Resolute Bay). The spring, or wet BOXTOP, is focused on fuel resupply; Jet Propellant (JP-8) for aircraft, Diesel Fuel (DF-8) for heating, and ULSD for vehicles. The fall, or dry BOXTOP, is

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<sup>1</sup> Royal Canadian Air Force, *B-GA-406-000-FP-001- Canadian Forces Aerospace Sustain Doctrine* (Winnipeg, MB: Commander 2 Canadian Air Division/Air Force Doctrine and Training Division, 2011), 1.

focused on supplies that were shipped by barge from the Port of Montreal to Thule AB early in the summer and consists of building materials, dry goods, large mechanical parts, etc. On average Op BOXTOP consists of approximately 50 augmentees in Alert and 100 in Thule, 3x CC-130 Hercules, 1x CC-177 Globemaster III, and 1x CC-150 Polaris for passenger transport to Thule AB. During the fall of 2014, the total cargo delivered was 377,000 lbs to Alert, 34,000 lbs to Eureka, 750,000 litres of JP8/DF8 to Alert, and 65,000 litres to Eureka.<sup>2</sup> In addition to Op BOXTOP, CFS Alert receives weekly sustainment flights (SF) in order to provide fresh food and ongoing resupply. The majority of SF are tasked to CC-130J, with approximately 25% tasked to CC-177. The fall 2014 Op BOXTOP costs were \$4,527,178.15, and the average costs over the past 5 years is approximately \$5 million.<sup>3</sup>

5. Due to the location of CFS Alert, all power generation for the Station is done on site and uses DF-8 flown in by aircraft. Both JP-8 and DF-8 are the same JP-8 fuel; DF-8 is directed to a different fuel farm upon offload in order to ensure no contamination of aircraft fuels. This single source fuel is the result of NATO STANAG Single Fuel Concept, and allows all RCAF aircraft to offload JP-8 into either fuel farm. CFS Alert heating and power generation for 2013 required 2,234,270L (compared to 2,190,901 litres consumed in 2012).<sup>4</sup>

## **DISCUSSION**

6. Reduction of costs for CFS Alert sustainment can occur in a number of ways. Various options examined would require capital investment including the construction of a hangar and/or pier at CFS Alert; dramatically changing the requirement for Op BOXTOP. Benefits would be the reduction/elimination of costs for the housing of aircraft/personnel and supplies at Thule AB,

<sup>2</sup> Maj Grant Cooke, *Op BOXTOP 02/14 SITREP NO 13, 040900Z Oct 14* (Thule, Greenland: Op BOXTOP Airlift Control Element, 2014), 2.

<sup>3</sup> George Stewart, Re: BOXTOP Costs- 12:21, 19 January, 2016.

<sup>4</sup> Gisele Amow, DRDC Alternative Power and Energy Related Projects, 31 October, 2014.

(\$2.7 million/BOXTOP) and shipment of supplies directly to Alert by barge, eliminating storage at Thule.<sup>5</sup> Either would create the opportunity for additional sovereignty operations by air or sea from CFS Alert that would speak to the Sense, Shield, and Generate functions. Currently, sovereignty operations are only conducted at the Station as part of ongoing SF. However, these options would be better suited for a CFS Alert long-term plan review conducted by both the RCAF and Canadian Forces Information Operations Group. If either of these options were implemented, it would likely take greater than a decade to realize either or both projects, with costs estimated in the tens of millions of dollars each, and fall outside the scope of this service paper for Horizon 1 cost reductions.

7. There are a number of options that can be immediately implemented that will improve the way in which CFS Alert is sustained and thus reduce reliance on Op BOXTOP. First is a dedication to ensuring that each SF maximizes use of cargo space. There are many times that aircraft arrive with space available for supplies with commensurate fuel offload. Effective cargo management on this scale would likely require more storage space dedicated to CFS Alert at 8 Wing Trenton, and the benefits would be realized through proper inventory management over time. More supplies could be purchased ahead of time for Alert and then warehoused at 8 Wing. A relatively small stock could then be used to take advantage of space as it became available on flights. In order to best take advantage of this, one Captain could be assigned as the Alert Officer of Primary Interest (OPI) as a secondary duty at 2 Air Movement Squadron. This would allow the OPI to be the single point of contact for the Station, Alert Management Office (AMO), Construction Engineering (CE), etc., and would be better positioned to maximize the load for each aircraft, especially given last minute changes. At the moment there is no single point of

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<sup>5</sup> Stewart, *Re: BOXTOP Costs- 12:21*

contact at 2 Air Movements Squadron and thus any advantage to the flexibility found by empty cargo space is lost as no single person is responsible for ensuring max loads. Traffic techs don't have direction/oversight on specific, ongoing, and immediate requirements for Alert, and thus are not in a position to take advantage of the space available. If there were an Alert OPI for the management of cargo, it can reasonably be expected that fewer items would have to be shipped to Montreal to be barged to Thule and thus flown in during fall BOXTOP; reducing costs to the RCAF by eliminating some of the shipping and/or required airlift. Exact cost savings would be difficult to estimate, as it is uncertain the average weight of missed opportunities that currently exist. This approach would also enable more purchasing just-in-time for dry goods and construction material that is otherwise purchased in May and June for shipment to the Port of Montreal in time for the barge in July.

8. Better control of food purchased for Alert is another part of overall cost reductions. Better purchasing and contracting practices are needed to ensure fresh food is delivered with appropriate expiry dates. A good example of this is with dairy products. During the fall of 2014, the Station was wasting an average \$1500/month on expired foods of various types, and with a change in dairy contractor, that number increased dramatically. The reason for this increase was due to the contractors' practices; buying discounted dairy closer to its expiry date to reduce their costs, which resulted in greater costs for the RCAF as the product would arrive in Alert already expired or close to its expiry date. The resulted in the food being thrown out due to safe food handling practices. The RCAF would thus often have to expend twice as much due to expired products. After Wing Foods interceded on behalf of the Station, the underlying issue was discovered and a new contractor was sought. The result has been less spoilage (December 2014

food spoilage was only \$279.01) and more cargo space available since the Station does not have to duplicate purchases.<sup>6</sup>

9. Contracted Air could be examined to determine cost benefits. By shipping more supplies via truck or rail (vice barge to Thule) to places such as Yellowknife, contractors could fly in more products at potentially lower cost than by barge. However, cost savings would likely be seen more for YFR and associated costs for our airframes/aircrews. This would allow those same aircraft to focus on operations and training elsewhere. One aspect of sustainment where this could best be employed is for ULSD delivery. Currently one CC-130 is dedicated to flying between CFS Alert and Resolute Bay for ULSD during wet BOXTOP. This fuel is currently barged to Resolute Bay; increasing the costs to DND. If contracted fuel deliveries were to be spread throughout the year, taking into account the planned annual 300,000 litres of ULSD, it would eliminate one complete CC-130 dedicated to each BOXTOP and the associated crews, YFR, and fuel for the aircraft. Based upon the fall BOXTOP numbers for one CC-130, this would mean approximately \$477,000 savings.<sup>7</sup>

10. Inventory control at CFS Alert should also be examined. Over the years inventory has accumulated on Station and there is no single point of control. This has resulted in an accumulation of excessive stock on site consisting of everything from wood, vehicles parts, and plumbing, electrical, and construction supplies. This stock has been lost over the decades due to sheer volume, necessitating annual purchases for items that may in fact already exist on Station. Based on discussions with both military and Nasittuq (Alert contractors) personnel, it can reasonably be expected to take one dedicated person a year to find, catalogue, and implement an

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<sup>6</sup> Alert Food Services Officer, Food Spoilage at CFS Alert, 2014.

<sup>7</sup> Stewart, *Re: BOXTOP Costs- 12:21*

effective inventory control system. This inventory control could also see a benefit through the removal of excess or useless items left over from decades of projects. There currently exists an estimated 1 million dollars' worth of copper wire left over on Station that could be sent for recycling.

11. Defence Research and Development Canada completed an energy study in 2012 and included a Statement of Work which recommended 98 improvements to the Station.<sup>8</sup> The cost would have been approximately \$640,000 to implement, however the fuel savings would be approximately 405,000 litres of DF-8/year. Based on 2013 consumption, that would decrease the Alert requirements from 2,234,270 litres/year to 1,828,750 litres/year for heating and power generation, and would be annual savings. This translates into the elimination of 3.9 CC-177 BOXTOP flights, and 10.5 flying hours. Conversely this would translate to 8.1 CC-177 SF or 144 CC-130 SF under the current plan. Savings would be best realized during Op BOXTOP as it would eliminate the need for even more flights due to the proximity of Thule and Alert.

12. Better fuel management during SF would see immediate cost savings. Currently, the plan is a two-day cycle to have each aircraft offload some fuel upon arrival in Alert, load passengers and cargo, then remain overnight (RON) in Thule, upload more fuel for the return flight, and RTB 8 Wing. The CC-130J offloads approximately 2,800 litres and the CC-177 offloads 50,000 litres per SF. If we assume a 3:1 ratio for CC-130J flights per month, CFS Alert receives approximately 58,400 litres/month. 2014 Spring BOXTOP delivered 1,400,000 litres and Fall BOXTOP 750,000 litres. In order to deliver the complete 2,300,000 litres of fuel using CC-177 only at 50,000 litres/offload, it would take 46 sustainment flights. This equals 15 flying

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<sup>8</sup> Gisele Amow, *Alert Energy Measures Statement of Work* (Dartmouth, NS: Defence Research and Development Canada, 2013).



hours/flight, thus approximately 690 hours. If the CC-177 were to increase each sortie by one extra day to add another full fuel offload, it would allow 105,000 litres per sortie to be offloaded vice 50,000 litres and would reduce the required missions to 22 (approximately 330 flying hours). More savings could be realized if two sorties were used on each additional day (due to distance, aircrews would not reach max duty day), thereby reducing required mission to 11, which is close to the number of SF CC-177 fly to CFS Alert each year. While cost per sustainment flight would increase, the associated costs for Op BOXTOP would drop and more than make up for the offset. Currently Op BOXTOP moves the required amount of fuel in approximately 93 hours, but the costs for increasing each sortie by one day would be approximately 2.7 hours each for a total of 59.4 hours due to the short distance between CFS Alert and Thule AB (no risk to crew duty day). Overall, we could eliminate the requirement for most of the fuel to be delivered during BOXTOP and it could focus on the remainder of the sustainment with fewer aircraft, crews, and costs, and could be complete within a week in both spring and fall.

## **CONCLUSION**

13. While implementation of all cost savings measures would undoubtedly dramatically reduce the length and cost of Op BOXTOP, these measures could be implemented in a phased approach. In the first phase 8 Wing could appoint an Alert OPI at 2 Air Movements Squadron, monitor existing changes to food procurement practises almost immediately. This would reap small dividends, but the OPI at 2 Air Movements Squadron will lead to better management of cargo and an overall positive effect towards the reduction of Op BOXTOP.

14. In the second phase, implementation of an additional day for each CC-177 sortie will have an immediate and dramatic impact on the annual fueling delivery during Op BOXTOP;

essentially reducing requirements to less than half of their current needs. It is also recommended that during the second phase, more of the DRDC energy projects are implemented, especially those that are low cost for high return. Most of the projects individually are less than \$10,000 and can be added as funds become available or as groups of smaller projects; the majority of which can be completed by CAF/Nasittuq staff already on Station. While implementation may take time, the long-term benefit of reducing fuel consumption by approximately 400,000 litres/year is dramatic and would further reduce dependence on Op BOXTOP.

15. Finally, in the long-term, it is recommended that the Nasittuq contract be amended to allow for an individual to be hired for inventory control. This would entail all the steps outlined in para 10, but would dramatically reduce waste for projects with costs passed on to the RCAF through the purchase of duplicate supplies, and the associated fuel required for transport. Inventory control would have an additional benefit of reducing the waste currently on Station and associated environmental concerns by removing excess stock/waste through the maximization of cargo space on aircraft heading south.

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