

## COMPARATIVE COSTS - COLOCKUM-TARP INCIDENT

VLAT - DC-10 (TANKER 911)

JULY 30, 2013

5 FULL LOADS @11,000 gallons each  
4.6 statute Miles of Retardant Line  
3.12 Flight Hrs.  
Flight distance Moses Lake ATB to the incident - 45 Miles

The following costs compare actual costs of VLAT Tanker 911 to deliver five loads of retardant to three different divisions on the Colockum- Tarp Incident on July 30, 2013. The costs for the P2V aircraft represent the estimated costs to accomplish the same missions/objectives as accomplished by the DC-10. Two scenarios are included. 1) Two P2Vs (one P2V-5 one a P2V -7) 2.) Four P2Vs to accomplish the objectives.

The reduction of costs for the "four P2V scenario" is due to accomplishing the 41 missions in one day vs accomplishing the 41 missions in two days. All aircraft are operating out of Moses Lake Airtanker Base.

A separate document outlines the cost data, etc. and other considerations in determining the comparative costs.

Two (2) P2Vs - 41 Loads, Landing Fees and services of an ASM/Lead  
\$380,900 - a two day operation

Four (4) P2Vs - 41 Loads, Landing Fees and services of an ASM/Lead  
\$ 366,400 - a one day operation

### COMPARATIVE COSTS

Two P2Vs -	\$380,900	
VLAT/DC-10	\$244,322	
Difference	\$136,578	
The DC-10 VLAT is cheaper by		\$136,578

Four P2Vs -	\$366,400	
VLAT/DC-10	\$244,322	
Difference -	\$122,078	
The DC-10 VLAT is cheaper by		\$122,078

## DATA AND COMPUTATIONS USED TO DETERMINE COMPARATIVE COSTS

To determine the comparative costs of VLAT DC-10 and P2Vs the following data, computations and rationale were used in this comparison. The P2V scenario duplicated the VLAT scenario with regard to tactical objectives and line length produced - 4.6 statute miles at the same coverage levels.

1. For the DC-10 VLAT I used the actual Daily Incident Cost Summary for July 30, 2013 - Moses Lake Airtanker Base
2. For the P2Vs I used the Daily Incident Cost Summary for P2V flights to the same general locations (minor distance difference) where P2V drops were made from Moses Lake on July 31, 2013
3. I used times for both the P2V-5 and P2V-7 (both assigned to the fire)
4. All airtankers were based at Moses Lake, no mobilization costs incurred.
5. The line length chart determined that 41 P2V loads would be required to cover the 4.6 statute miles of VLAT line. This includes a 20% "overlap" as the subsequent P2V drops are tagged on/extended.
6. ASM/Bravo and Lead plane costs were included - the five VLAT loads were accomplished by Bravo 6 in about 7 hours flight time. The 41 P2V loads would require two Bravo/Leads. One Bravo for the VLAT was sufficient as the Bravo module could refuel when the VLAT went in for fuel.
7. With four P2Vs it would take two Bravo/Leads one day to drop 41 loads ( an optimistic "efficiency scenario", whereas with two P2Vs it would take two days to cover the 4.6 statute miles, again an optimistic estimate.
8. The average flight time to the three different drop areas/divisions was about the same distance - 45 statute miles
9. The five (5) VLAT loads were measured in statute miles from the air using GPS.
  - Division C - Coverage Level 6 - .75 miles
  - Division X - Coverage Level 3 - 1.25 miles
  - Division W - Coverage Level 2 - 2.6 miles
  - Total Distance: 4.6 miles
10. The Interagency Aerial Supervision Guide (page 110) was used to determine line length for the respective coverage level. The chart for the P2Vs was 2100 gallons (average between the 2,000 gallon and 2,000 gallon chart)
11. A line length distance reduction of 20% was used to account for overlap necessary for "tag-on/extends for the next airtanker.
12. A 2100 gallon drop, with the "overlap" for Coverage Level 2 was 840 ft. and 630 ft. for Coverage Level 3.
13. \$900 an hour was used for ASM/Lead flight time.

## USE OF VLAT (TANKER 911 VLAT) ON COLOCKUM-TARP INCIDENT

July 30, 2013

Note: VLAT - Very Large Air Tanker - the VLAT used on this fire was a DC-10 temporarily stationed at Moses Lake Airtanker Base

Gallons delivered per load: 11,600 gallons of retardant

Heavy airtanker commonly used is a P2V with 2100 gallons capability

It takes about 6-7 P2Vs loads to equal one DC-10 load - considers need for P2Vs to overlap the previous drop in order to connect the previous P2v drops together and to prevent a gap or weak coverage which may allow the fire to spread through the weak point.

Recent detailed analysis (" VLAT to Large AT (P2V) Comparison - 100 Nautical Mile Dispatch (2013) supports the cost effectiveness, and tactical effectiveness of VLATs vs. heavy airtankers

7/30/13 objectives for Division C and Division X/W

DIV C - stop spread of fire up (to the west/southwest) in Tarpiscan Creek and keep fire east of Colockum Road. Also to square up and shorten containment line in order to reduce overall containment line length in Div C - reduce resource loss, save the old logging unit regeneration, and prevent spread of the fire in to the Coffin Game Reserve and structures located west of the current fire perimeter. The proposed/actual drop accomplished the objectives.

The drops were made under the supervision of Bravo 6, an Aerial Supervision Module with Lead Greg House and ATGS (air attack) Albert Lynch. A total of two loads (three individual drops) were made on Division C -strategy : direct/indirect. The line length for the two drops was .75 miles. As of 8/4 the fire had not spread past the drop but had "eaten" about mid-way through the retardant drop. The drop in the bottom of the drainage was "fortified" periodically with water bucket drops.

It would have taken about 10-14 P2V loads (with less effective coverage), to equal what was produced by the two VLAT loads. This recognizes not only line length but also line width. The VLAT line is approximately twice as wide as the P2V line. Each of the P2V drops would have had to have overlapped the previous drop, thus reducing the total length of line produced.

Effective coverage level for broken terrain:

Coverage level 6 (a moderately heavy coverage level) was selected for effectiveness in this fuel type. The flight line started in grass on the ridge top, continued on the edge of sparse old growth, continued through the interior edge of and old cut unit/reproduction) and terminated on a grass covered bench where dozers continued the line.

The drop objective was to connect from a ridge (Colockum Road) down into N. Frk. of Tarpiscan Creek and terminate on the ridge/bench to the south. This objective was attained.

The drop altitude gave uniform coverage on both the ridge/bench terrain and in the creek/unit some 400-500 feet lower. The DC-10 drop system/retardant mass produced a very effective uniform line with minimal retardant dispersion - all the way into the dry creek bottom. I believe that the P2Vs could not have produced nearly as effective line.

Drop terrain:

Considering the safe flight path/route of the airtanker when making a drop, I don't think that the P2V could have accomplished the objective as effectively because they could not have provided the required coverage level in the bottom of the drainage - there was no safe exit/escape after dispersing the retardant. On the other hand the DC-10 could maintain level flight above the ridge tops and exit safely. The mass of the load kept intact and produced the desired coverage level even in the bottom of the drainage. - Mission accomplished in two loads with some overlap in the critical part of the drainage where the fire had a high probability of escape.

DIVISION X/W - SOUTH END OF THE FIRE ADJACENT TO THE COLUMBIA RIVER ON THE EAST AND TO THE WIND GENERATION FARM AND MULTIPLE STRUCTURES ON THE SOUTHWEST SIDE OF THE FIRE

During the period 7/27/30 the fire moved south, often advancing 2-4 miles overnight. The Divisions were unstaffed until mid-day 7/30. As the fire moved south there was concern that the fire could eventually impact I-90, the wind generation farm and numerous structures located in the Park Creek development and structures in Caribou Canyon/Road area. The objective of the day was to stop the southerly/southwesterly progression of the fire, thus preventing fire spread in to the wind generation farm and the structure/development in Park Creek and Caribou Canyon, etc. area.

Two VLAT loads were made - one indirect in Division X and two in Division W. A coverage level 3 (relatively light) was selected for the grass/brush fuel model in Division X. An indirect strategy was applied as the line would serve a line to support a burnout. The load (split in to two drops) in Division X was to serve as an anchor point adjacent to the Columbia River. Line length for the one load was 1.25 miles. The original objective for the south end of the incident (Divisions X and W) was to make a continuous retardant line from the Columbia River west to the Park Creek/Caribou Canyon in Division W. This could not be accomplished during the remaining daylight on 7/30.

The last two loads (six drops) were direct and parallel drops at a coverage level 2 (light coverage level) were made in Division W adjacent to where the fire was moving to the ridge top on the south side of Quilonene Canyon near Quilonene Road. The drops reinforced Quilonene Road. Line length for the two loads was 2.6 miles. An air attack recon the next morning confirmed the success of the drops. On 8/1 the focus of the retardant drops was in the wind farm/Park Creek/Caribou Canyon area. The DC-10 VLAT was not available 8/1 and 8/2 due to pilot duty limitations and required days off. Heavy airtankers were moved in from Redmond to accomplish the aviation tactical objectives in Park Creek/Caribou Canyon on 8/1. The heavy airtankers (P2Vs) in this scenario, were the most appropriate tool considering the location of the numerous structures and need for multiple relatively short drops. Bravo 6 effectively integrated five helicopters (one Type 1 and four Type 2) in to the "tactical mix". As far as I know no structures were lost - much to the credit of Bravo 6, and later by Lead 68, Brock Hindman.

#### GENERAL REMARKS

1. We feel that the cost per gallon delivered by the VLAT was substantially less than had the objectives been accomplished by heavy air tankers- refer to the information contained in the VLAT-P2V Analysis referenced at the beginning of this report, the use of the VLAT was more cost effective than use of multiple P2Vs
2. The VLAT was the only airtanker available at the Moses Lake Airtanker Base - P2Vs would have had to have been deployed from Redmond Air Center, if available, or from some other airtanker bases in another GACC
3. The objectives for Divisions C and X/W could not have been accomplished in the desired time frame

without use of the DC-10 VLAT

4. Considering the "terrain component", the VLAT was able to provide the desired coverage level in Division C while it is doubtful that the P2V could have.
5. The VLAT produced a wide footprint of continuous uniform line with no gaps or "weak coverage areas" - a line that has held for at least 6 days. (8/4)
6. The VLAT was able to accomplish the tactical objective in both Divisions C and X/W in 3.12 hours, a relatively short time. The number of drops required from a P2V would have precluded drops on Division X/W - depending on the number of P2Vs available for the Colockum - Tarp Incident
7. There was competition for airtanker support in the PNW GACC on 7/30 - PNW priorities may have precluded deployment of heavy airtankers for the Colockum- Tarp Incident.
8. The VLAT DC-10 was effective in Division C and Division X/W - and achieved the tactical objectives desired by the Operations Section Chief, the respective Division Group Supervisors, Aerial Supervision Module Bravo 6 and the ATGS (Air Attack).
9. The eleven individual drops with the VLAT significantly reduced the number of "pilot drop exposures" as compared to the number of drops/passes that would have been required with heavy airtankers.

Report by:

*(name redacted)*

Team #x ATGS

8/4/13