General Characteristics		
1	**Abstract of Model Capabilities**	The Volcanic Ash Forecast Transport And Dispersion (VAFTAD) model focuses on volcano hazards for aircraft operations. VAFTAD forecasts the visual ash cloud in time and space following a volcanic eruption anywhere in the world. The model is user run, at any time, through a TELNET connection to ARL, using screen prompted input. An ash particle mass-size distribution is uniformly distributed throughout the initial ash column. Particles are advected horizontally and vertically by input winds, fall according to Stoke's law, and are bivariate-normally diffused. Output charts of the visual ash cloud are automatically phonefaxed to the user within several minutes . During volcano hazards alerts the charts are also disseminated to the public over weather-fax and weather-satellite systems and are displayed on INTERNET. In response to user requests, output charts for volcanos of interest not associated with alerts are updated daily on the site. A run of VAFTAD site has also been added that allows users to run VAFTAD interactively with their own specifications.
2	**Sponsor and/or Developing Organization**	NOAA Air Resources Laboratory SSMC3 Rm 3151 Silver Spring, MD 20910 Idaho Falls, ID 83415-5209 (301) 713-0295 (301) 713-0119 **Fax**
3	**Last Custodian/ Point of Contact**	Jerome L. Hefter NOAA Air Resources Laboratory SSMC3 Rm 3151 Silver Spring, MD 20910 Idaho Falls, ID 83415-5209 (301) 713-0295 (301) 713-0119 **Fax** jerome.heffter@noaa.gov **primary individual** same **secondary individual**
4	**Life-Cycle**	Developed for use in volcano hazards alerts using ICAO standards for volcanic ash cloud forecast charts.
5	**Model Description Summary**	See abstract above.
7	**Strengths/ Limitations**	**Strengths:** User run in 1-2 minutes for any location globally with various gridded wind input options. Output charts of the forecast visual ash cloud, not ash concentrations, are preferred for aircraft operations**.** **Limitations:**
8	**Model References**	**!** Hefter, J.L., and B.J.B. Stunder, Volcanic ash forecast transport and dispersion (VAFTAD) model, Wea. Forecasting, 8, 533-544, 1993 **!** Hefter, J.L., Volcanic ash model verification using a Klyuchevskoi eruption, Geophy. Res. Let., 23, No.12, 1489-1492, 1996
9	**Input Data/Parameter Requirements**	Run description (choice) Geographic region (choice) Volcano name Volcano latitude and longitude Volcano summit height Eruption date and time Euption duration Ash column top height
10	**Output Summary**	Each panel in a 4-panel column on an output chart shows the forecast visual ash cloud for a single valid time after eruption. The upper three panels are for three layers applicable to aircraft operations; the bottom panel is a composite from the surface to 55000 ft. Each chart has two 4-panel columns; chart 1 columns are valid for +12h and +24h; chart 2 columns for +36h and +48h. Both charts include complete eruption and meteorological data identification information. Hazard alert volcanos and volcanos of interest on Internet site: www.arl.noaa/ready/vaftadmenu.html. User interactive run on Internet site: www.arl.noaa/ready/vaftadmenu.html.
11	**Applications**	Primarily for aircraft operations
12	**User-Friendliness**	TELNET modem and phonefax

13	**Hardware-Software Interface Constraints/ Requirements**	**Computer operating system:** UNIX **Computer platform:** No information provided. **Disk space requirements:** No information provided. **Run execution time** (for a typical problem)**:** 1-2 minutes **Programming language:** FORTRAN 77 **Other computer peripheral information:** No information provided.
15	**Surety Considerations**	**All quality assurance documentation:** **Benchmark runs:** **Validation calculations:** **Verification with field experiments that has been performed with respect to this code:** See references above.
16	**Runtime Characteristics**	Several seconds (CRAY) to 1-2 minutes (workstation).
	Specific Characteristics	
	Part A: Source Term Submodel Type	
A1	**Source Term Algorithm?**	**__✔__YES __NO** 5 volcanic ash models a. Particle size 0.3 to 30 micron diameter. b. Distribution uniform throughout the initial volcanic ash column.
	Part B: Dispersion Submodel Type	
B1	**Gaussian**	**__Straight-line plume __Segmented plume __ Statistical plume __✔__ Statistical puff** Bivariate normal.
	Part C: Transport Submodel Type	
C1	**Prognostic**	NCEP global spectral model and primative equation model forecast gridded meteorology.
	Part D: Fire Submodel Type (Not Applicable)	
	Part E: Energetic Events Submodel Type (Not Applicable)	
	Part F: Health Consequence Submodel Type (Not Applicable)	
	Part G: Effects and Countermeasures Submodel Type (Not Applicable)	
	Part H: Physical Features of Model (No Information Provided.**)**	
	Part I: Model Input Requirements	
I1	**Radio(chemical) and Weapon Release Parameters**	**Release rate: __✔__ Continuous __ Time dependent __✔__ Instantaneous** **Release container characteristics: __ vapor temperature __ tank diameter** **__ tank height __ tank temperature __ tank pressure __ nozzle diameter** **__ pipe length** **Jet release: __ initial size __ shape** **__ concentration profile at end of jet affected zone** **Release dimensions: __ point ___ line ___ area** Vertical line source (volcano summit to ash cloud top) **Release elevation: ___ ground ___ roof ___ stack**
	Part J: Model Output Capabilities	
J10	**Other**	Visual ash cloud (correlated to ash air concentration as a function of eruption magnitude).
	Part K: Model Usage Considerations	
K1	**Ease of Model Use**	**Training required to run the model: __ background (years of education)** **__ training time needed on the model to be able to exercise all model capabilities** No training required. **Training required to continue development of the model:** **__ background (years of education)** **__ training time needed on the model to be able to exercise all model capabilities**

K2	**Time to Process From Notification of Release (including data acquisition) to Production of Product Listed in #K1, Listed for Platforms for Which the Program is Already Compiled**	1 to 2 minutes.
K3	**Ease of Use of Output, Evaluated as the Time Needed to Train a College Graduate in the Use of the Output**	Several hours.