

ACAM

U.S. AIR FORCE
AIR CONFORMITY APPLICABILITY MODEL



QUICK START GUIDE

Version 5.0

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Contents

1: INTRODUCTION	3
ACAM Software Installation and Uninstallation Instructions	4
Interface and Features	4
RIBBON	5
STATUS PANEL	7
WORKSPACE	8
Flow and Results-Oriented Design	9
The Status Panel	9
Check and Status Forms	10
Numbered Status Tabs	10
2: BASIC ACAM OPERATIONS	11
Running and Exiting ACAM	11
ACAM Files and Reports	12
ACAM FILE	12
ACAM REPORTS	12
ACAM Views	13
3: NINE STEPS TO CREATE AN ACAM REPORT	15
Introduction	15
STEP 1: Launch ACAM and Save/Create ACAM File	16
STEP 2: Input Document Information	17
STEP 3: Select Desired Air Force Base	18
STEP 4: Proposed Action Information	19
STEP 5: Add All Desired Activities	20
STEP 6: Calculate Steady State	21
STEP 7: Analyze Proposed Action	22
STEP 8: Re-Calculate Steady State	23
STEP 9: Creating the ACAM Report(s)	24
4: CONSTRUCTION CASE STUDY	26
Introduction	26
General Information	26
Activity Phases	27
Demolition	30
Site Grading	32
Trenching	33
Building Construction	34
Architectural Coatings	35

Paving.....	36
5: AIRCRAFT FLIGHT OPERATIONS CASE STUDY.....	37
Introduction	37
General Aircraft Terminology.....	37
Landing and Takeoff Cycle (LTO).....	37
Touch and Go Cycle	38
4.1.3 Auxiliary Power Unit (APU).....	39
Aircraft Activity Overview	39
General Information.....	39
Activity Type.....	41
Aircraft and Engine.....	43
Flight Operations	45
Auxiliary Power Unit.....	46
Engine Test Cell(s)	47
Aerospace Ground Equipment	48

1: INTRODUCTION

As amended, Section 176(c) of the Clean Air Act (CAA) requires federal agencies to assure and make evident that every action and decision conforms to applicable air quality requirements including State Implementation Plan (SIP) for purposes of attaining the National Ambient Air Quality Standards (NAAQS). The U.S. Environmental Protection Agency (EPA) published its final conformity rules in November 1993 (amending 40 Code of Federal Regulations (CFR) 51 and 93); establishing procedures and requirements that federal agencies must satisfy in determining whether a certain action will conform. The conformity regulations differentiate federal actions into transportation actions and non-transportation-related actions; however, most Air Force proposed actions consist of non-transportation related projects. Therefore, the Air Force has developed an automated screening tool known as the Air Conformity Applicability Model (ACAM) to perform a simplified General Conformity Rule Applicability Analysis for non-transportation proposed actions and projects.

ACAM is a computer model used by Air Force planners and Environmental Impact Analysis Process (EIAP) personnel in the determination of General Conformity applicability for proposed actions in nonattainment or maintenance designated areas. This tool is used to identify proposed actions and alternatives which would likely result in no or minimal emission increases, and those actions which may result in no or minimal emission increases, and those actions which may require further air quality analysis and undergo a General Conformity determination. ACAM calculates criteria pollutants, hazardous air pollutants (HAPs), and greenhouse gas (GHG) for proposed Air Force action while requiring minimal inputs from the user. The resultant calculations are entered into standardized reports that follow the requirements for the Air Forces Record of Conformity Analysis (ROCA) reporting format.

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ACAM Software Installation and Uninstallation Instructions

SYSTEM REQUIREMENTS

ACAM is a standalone desktop application for use on Standard Government Computers running Microsoft Windows XP service pack 3 through Windows 10.

INSTALLATION

Obtain the latest version of ACAM from AFCEC eDash website or www.AQhelp.com.

To install ACAM, double-click to run the ACAM installer File (e.g. ACAMSetup111413.exe), then follow the instructions in the Setup Wizard. ACAM creates a desktop icon automatically after installation.

UNINSTALLATION

ACAM can be uninstalled through the Microsoft Window's Control Panel and following the normal steps to uninstall a program on a PC.

Interface and Features

ACAM implements a results-oriented interface to provide an environment in which a user can quickly create, modify, and finalize an air analysis for various Air Force activities. The results-oriented interface inherits many designs and features from Microsoft Office products such as Microsoft Word to give a familiar feel to the user. This assists in the ease of usability of the program as the user will likely possess knowledge of how certain aspects operate.

The interface of ACAM is divided into 3 main sections, shown in Figure 1. The 3 main sections will be referred to as the Ribbon, Status Panel, and the Workspace.

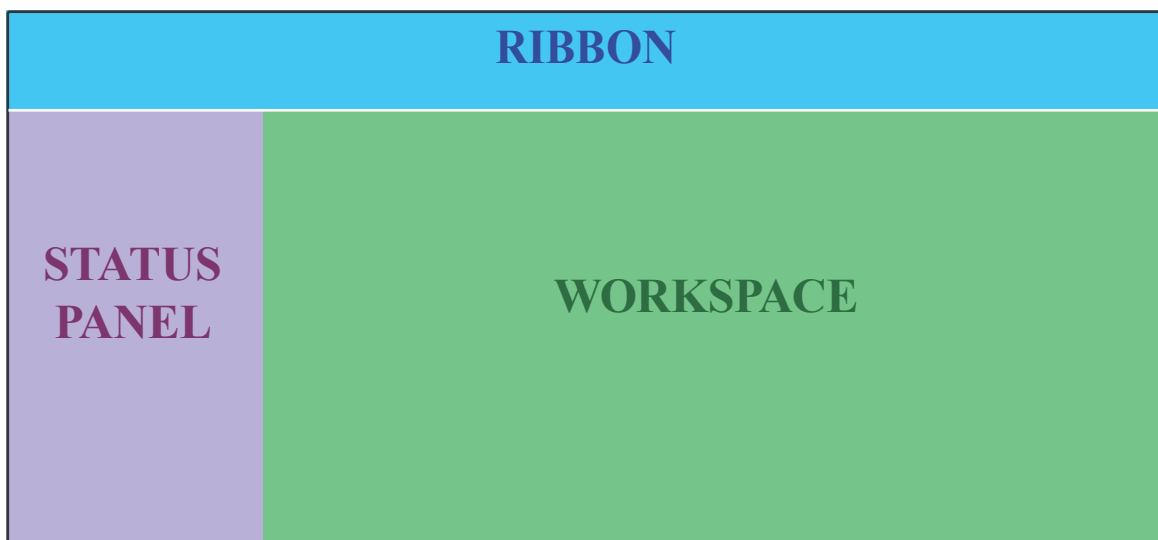









Figure 1 - ACAM Application Main Section



RIBBON

The first main section of ACAM's results-oriented interface is the Ribbon. ACAM's Ribbon is the area above the Workspace and Status Panel. The Ribbon section is made up of tabs (the upper white portion) and their menus (the lower grey portion). This section gives the user easy 2-click access to all functions in the program.


RIBBON - FILE MENU

Button	Button Name	Button Use (What is it for?)
	New	Creates a new ACAM file (and closes the currently open ACAM file).
	Open	Opens an existing ACAM file (and closes the currently open ACAM file).
	Save	Saves all changes made to the current ACAM file.
	Save As	Saves all changes made to the current ACAM file in a specified file.
	Close	Closes the current ACAM file.
	Document Information	Displays the Document Information window.
	Fleet Mixture	Displays the vehicle Fleet Mixture window.




RIBBON - VIEW MENU

Button	Button Name	Button Use (What is it for?)
	List View	Changes ACAM's Workspace current display format to a list view.
	Timeline View	Change ACAM's Workspace current display format to a timeline view.

RIBBON - REPORT MENU

Button	Button Name	Button Use (What is it for?)
	Microsoft Word Reports	Displays the Microsoft Word Reports window for generating summary and detailed ACAM reports.

RIBBON - HELP MENU

Button	Button Name	Button Use (What is it for?)
	Help	For further assistance when using ACAM, clicking this button opens an electronic copy of this ACAM Quick Start Guide.
	Support	If encountering an issue with ACAM not addressed in this Guide, clicking this button will display contact information for additional technical support.
	About	Displays background information for owners/creators of ACAM.

STATUS PANEL

The second main section of ACAM's result-oriented interface is the Status Panel. As shown previously in Figure 1, the Status Panel is the area to the left of the workspace. The purpose of the status panel is to give the user a fast and easy to use summary of the minimum report requirements needed to generate an ACAM Report with the current ACAM File.

This section is broken up into four parts, starting from top to bottom:

1. Base Selection
2. ACAM Warnings
3. Document Information
4. Application Information

The four parts listed above are shown in Figure 2.

Base Selection displays information about the Air Force base that the air analysis is for. This includes the base name and state that the base is located in.

ACAM warnings displays a list of tasks that are the minimum requirements to complete an ACAM file. This part of the Status Panel lists out all of the tasks required to complete an ACAM file and generates an ACAM Report in order from top to bottom (the first task is the top warning and the last task is the bottom).

Document Information displays data about the currently opened ACAM file. This will display who created the ACAM file and what version of the ACAM file is opened.

Application Information displays data about the ACAM program. This is where a user can see what version of the ACAM program he/she has.









Figure 2 – ACAM Status Panel



NOTE: The best way to complete an ACAM file is to start at the top of the ACAM warnings list and work your way down. Doing this will allow the user to take advantage of all the smart features that make completing an ACAM file easy. The warnings presented when opening an ACAM file, as well as other frequent warnings will be discussed on the following page.

STATUS PANEL - ACAM WARNINGS LIST

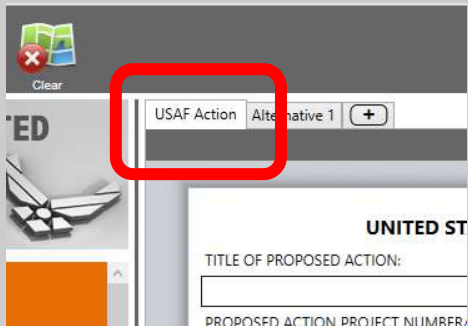
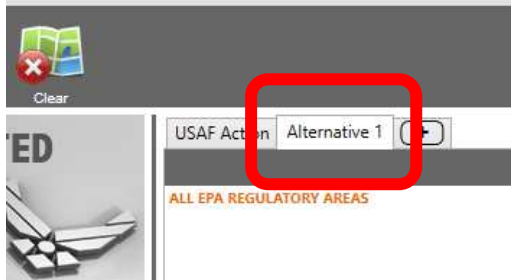
Warning / Button	Task Required to Complete	What the Button Does When Clicked
 Save Warning. File has been modified.	Indicates that the ACAM file has been modified and the user should save the file.	Button will save all changes made to the current ACAM file.
 Document Information Required.	Indicates that the Proposed Action Information is not complete.	Button will navigate the user's workspace to the "USAF Action" tab.
 Proposed Action Information Required.	Indicates that the Document Information and Regulatory Area Standards are not complete.	Button will display the Document Information window.
 No Base Selected.	Indicates that no Air Force base is selected.	Button will navigate the user's ribbon to the "Insert" tab
 At Least One Activity Required.	Indicates that no Activities have been added to the ACAM file.	Button will navigate the user's ribbon to the "Insert" tab
 Steady State Calculation Required.	Indicates that the ACAM file needs to re-calculate when air emission steady state will occur.	Button will re-calculate air emissions steady state.

WORKSPACE

The third and final main section of ACAM's results-oriented interface is the Workspace. ACAM's Workspace is the area below the Ribbon and two the right of the status panel. Refer to Figure 1 for reference. The Workspace section is made up of tabs and pages, similar to Microsoft Excel's tabs and spreadsheets.

Buttons specific to the Workspace will be discussed in the table on the following page.

WORKSPACE - TABS / BUTTONS

Tab / Button	Tab / Button Name	What the Tab/Button Does When Clicked
	Proposed Action Information (USAF Action) Tab	Tab will display the proposed action information tab on the user's workspace
	Alternative 1 Tab.	Tab will display the TOTAL emissions from each activity

Flow and Results-Oriented Design

ACAM's results-oriented design also provides the user with a clear and easy to follow path for completing an ACAM Report. This is achieved with three interface designs:

1. The Status Panel
2. Check and Status Forms
3. Numbered Status Tabs.

These will be discussed in the following corresponding paragraphs.

The Status Panel

As stated previously, the Status Panel gives the user a quick and easy to use summary of the minimum requirements needed to generate an ACAM Report with the current ACAM file. The Status Panel can be thought of as a roadmap for creating an ACAM report. This roadmap contains two great features that help to make using ACAM fast and easy. The first feature is every warning listed in the ACAM Warnings list is a button that will either open the appropriate window or will navigate the user to the section of the ACAM file that needs to be completed. The second feature that enhances the users' experience is that these Warnings are displayed to the user in the most optimal order (from top to bottom) to be addressed in the process of completing the ACAM file. These two features working together gives the user a on stop shop for completing the ACAM File.



NOTE: A user can click on the first ACAM warning until all of the warnings are gone to complete an ACAM file.

Check and Status Forms

Every screen or form that requires user input in ACAM follows the same design; a Check Form Button (Figure 3) at the bottom of the form and a Form Completion Status Indicator (Figure 3) at the top of the form. Clicking on the check button will start a validation process in which ACAM will check the entire form for correctness and completion. If any field is incorrectly filled out or empty, ACAM will highlight the field(s) in red and the form completion status indicator will display “Incomplete”. If all fields are filled out correctly, ACAM will update the form completion status indicator with “Complete”. Check and Status Forms provide the user with immediate feedback on the correctness and completion of all user inputs for any given form in ACAM.

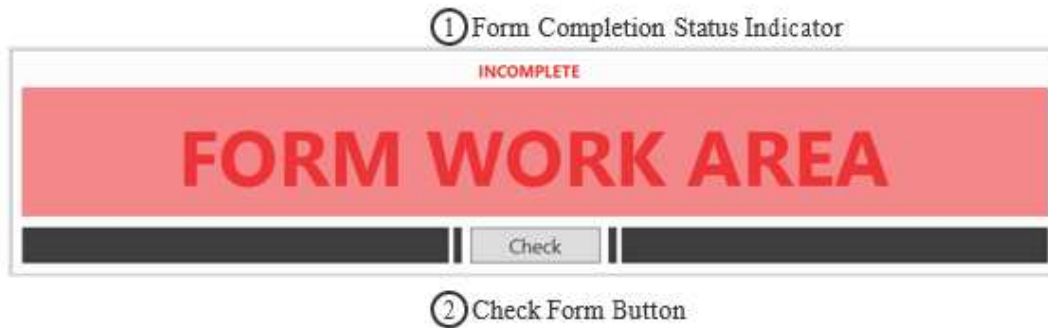


Figure 3 – ACAM Check and Status Forms

Numbered Status Tabs

A window that contains multiple forms implements ACAM’s numbered status tabs (Figure 4). Numbered status tabs are tabs that indicate the completion status of the form in the tab area and are ordered in a way that allows the user to take advantage of all the smart features that make completing an ACAM file easy.



NOTE: Some smart features and automations in ACAM require the user to complete all tab in the order that they are numbered.

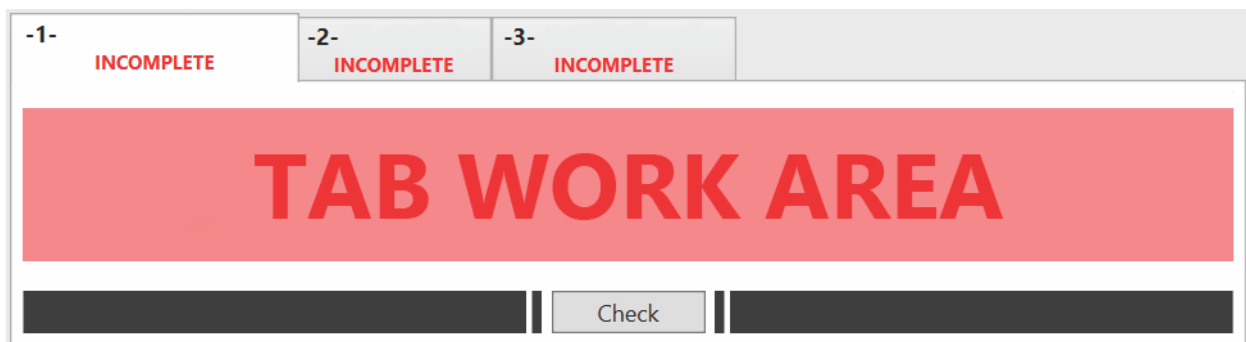


Figure 4 - ACAM Numbered Status Tabs

2: BASIC ACAM OPERATIONS

Running and Exiting ACAM

Windows usually provides more than one way to perform a task and starting ACAM is no exception. The standard way to get ACAM started is double clicking the ACAM program icon (Figure 5) on your desktop. This will open a new ACAM file.

Another way to start ACAM is by double clicking the name or icon of an ACAM file (Figure 6) in Windows Explorer or My Computer. This will open the ACAM file that the user double clicked on.



Figure 5 - Program Icon



Figure 6 - File Icon

Exiting ACAM is just like any other Microsoft office product, just click on the “x” icon in the upper right-hand corner (Figure 7); just as would be done when exiting any program on a PC.



Figure 7 – “x” Icon



NOTE: If there are any unsaved changes to the current ACAM file, the user will be prompted with the option to save, such as when exiting a Microsoft Word document.

ACAM Files and Reports

ACAM has two basic outputs.

1. ACAM File (.ACAM)
2. ACAM Report (.docx)

These outputs are vastly different but can be easily confused. To help understand the difference we will compare ACAM to Microsoft Word and its outputs.

ACAM FILE

An ACAM file can be used to store and share user inputs via email, flash drives, shared drives and by using other mediums so long as the other user has ACAM installed on their computer. Once the file is shared, changes can be made or updated and then be shared again. ACAM provides the user(s) with immense flexibility in usage and storage.

ACAM files are created by either opening the ACAM program in the manners previously discussed, or if the program is already open by clicking the “New” button shown in Figure 8; this button is located by clicking the “File” button in the Ribbon of ACAM.

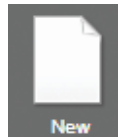


Figure 8 - “New” button

ACAM REPORTS

An ACAM report can be thought of as the final product of an ACAM file. Similarly, a printed paper from Word can be thought of as the final product of a Word file. ACAM reports display the final estimated total air emission generated by the all the activities inputted by the user in an ACAM file. ACAM reports just like files can be email and shared with anyone. ACAM reports can be created after an ACAM file is complete and has no warnings listed in the Status Panel

There are two types of ACAM Reports. The ACAM Summary Report compiles the total yearly emissions for a given set of activities in the ACAM File. It will flag any pollutant thresholds that are exceeded. This type of report is beneficial in determining if the selected Air Force Base exceeds any thresholds, or just displays the amount of pollutant contributed by the base activity by displaying an indicator level. The ACAM detail report provides more information regarding the actual pollutant sources. Each activity in the ACAM document has its own section in the detail report, which helps show which activities are causing the most pollution. It should be noted that the values for the activities, are the **total amount for the time period**; they are not annual values.

ACAM Reports can be created after an ACAM file is complete and has no warnings in the status panel. Steps for creating an ACAM report will be discussed later in this document.

ACAM Views

ACAM allows the user to analyze and interact with data through two different layouts called “views”. The two types of views are accessed by clicking on the “VIEW” tab in the ribbon of ACAM. The user will then be presented with two options; List View and Timeline View.

List View, like the name suggests, lists all the activity inputs (in the Workspace) compiled by the user as well as the emission totals for the entire activity, or annually if it is set to run indefinitely for each individually created activity. These summary blocks are designed to be easy to read and refer to so the user can make observations before generating a report. Furthermore, activities can be edited or deleted by clicking the corresponding buttons. For reference, an example of activities in a given ACAM file in List View are shown below in Figure 9.

USAF Action

Alternative 1

List View

ALL EPA REGULATORY AREAS

EDIT

DELETE

AC

F-5

Start Date

1/2018

End Date

INDEF

Activity Description

Example for ACAM Quick Start Guide

Activity Emission for 1 Year (Tons/Year)

VOC	NO _x	CO	SO _x	PM 10	PM 2.5	Pb	NH ₃
1.82	0.61	5.59	0.13	0.63	0.28	0	0

EDIT

DELETE

CD

ACAM Example Construction

Start Date

1/2018

End Date

3/2018

Activity Description

ACAM Example for Quick Start Guide

Demolition Phase Total Emissions (Tons)

VOC	NO _x	CO	SO _x	PM 10	PM 2.5	Pb	NH ₃
0.05	0.3	0.3	0	0.02	0.02	0	0

EDIT

DELETE

HT

ACAM Example

Start Date

1/2018

End Date

INDEF

Activity Description

ACAM Example for Quick Start Guide

Activity Emission for 1 Year (Tons/Year)

VOC	NO _x	CO	SO _x	PM 10	PM 2.5	Pb	NH ₃
0.04	0.64	0.54	0	0.05	0.05	0	0

EDIT

DELETE

Figure 9 – ACAM List View

Timeline View provides the user with an interactive timeline for all activities. The timeline is broken up by year blocks and displays emissions thresholds for that year. If the total yearly emissions are below emission thresholds designated by the regulatory areas that encompass the Air Force Base selected, then the number displayed for a given criteria pollutant represents the total tons **under** the emission threshold, and will be green in color. If the total yearly emissions exceed a threshold, then the number will represent the total tons **over** the emissions thresholds. Refer to Figure 10 for reference.

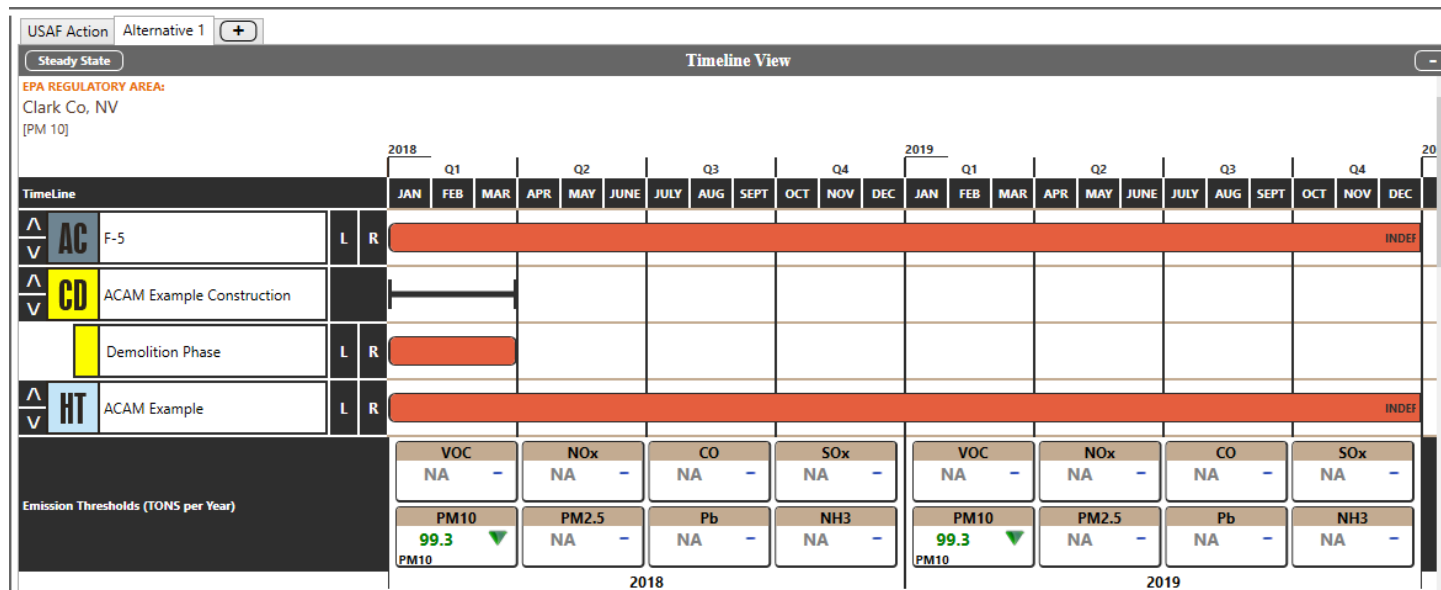


Figure 10 – Timeline View

3: NINE STEPS TO CREATE AN ACAM REPORT

Introduction

ACAM can create air emissions analysis reports in nine easy steps. To make this process easier, ACAM also provides an interactive road map in the form of the Status Panel as previously mentioned. In this section of the ACAM Quick Start Guide. An overview of the nine steps is provided below, and each step will be discussed in further detail in the following pages of this Guide.

THE 9 STEPS TO CREATE AN ACAM REPORT

Step 1: Launch ACAM and Save/Create the ACAM File

Step 2: Input Document Information

Step 3: Select Desired USAF Base

Step 4: Proposed Action Information

Step 5: Add All Desired Activities

Repeat until all Activities are inputted and reviewed for accuracy

Step 6: Calculate Steady State (whenever prompted in the Status Panel)

Step 7: Analyze Proposed Action

Step 8: Re-Calculate Steady State

Step 9: Create the desired ACAM Report(s)



NOTE: Be sure to save any changes to the ACAM File when prompted to in the Status Panel.

STEP 1: Launch ACAM and Save/Create ACAM File

Launch ACAM as previously discussed by clicking the ACAM Icon on the Desktop of the in-use Personal Computer (PC), or wherever the program launch icon is located. The user will be greeted with the default ACAM opening page with numerous warnings located in the status panel. The user should tackle these warnings in order from top to bottom. The first warning presented to the user is shown below.



Figure 3.1

By clicking this warning (pictured above, Figure 3.1 Left) or by navigating to the "FILE" menu in the ribbon of ACAM and clicking the "Save" (Figure 3.1, center) or "Save As" button (Figure 3.1, left) the user will be prompted with the save window presented when saving any file on a PC for the first time (see Figure 3.2).

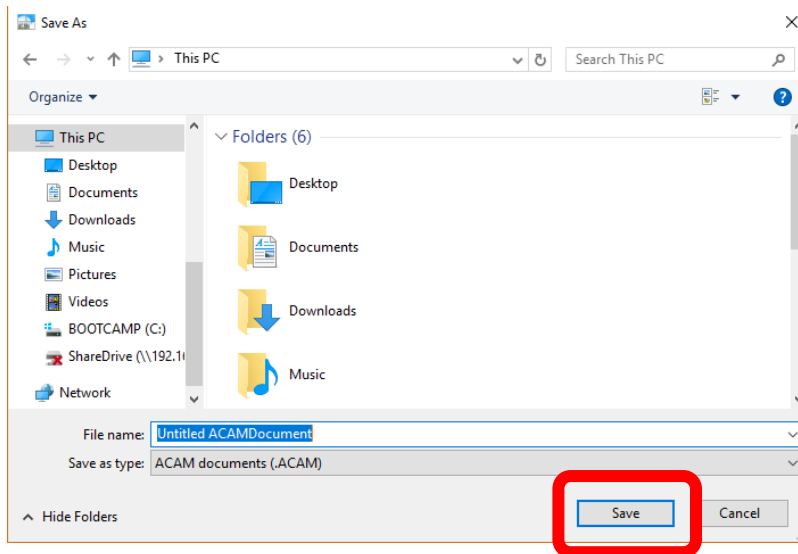


Figure 3.2 – Save As Window

Title the ACAM document and select a desired location on the PC in use to save the file. Finalize the process by Clicking "Save" on the Save Window.



NOTE: Once this step is completed, the save warning in Figure 11A will pop up anytime the document is changed. Clicking it updates any changes made to the document.

If the user does not want to make any changes to the current document, but wants to continue to alter it, click "Save As" (shown in Figure 11B) to save another version of the current document.

STEP 2: Input Document Information

The second warning in the ACAM Status Panel to address is the Document Information Warning. By clicking the warning (Figure 3.3, left) or the “Doc Info” button in the “FILE” menu of the ribbon (Figure 3.3 right), a Document information window will open.



Figure 3.3

The user will be prompted to fill out the required information in both tabs, shown in Figures 12.1 and Figure 12.2. Click “Check” at the bottom of each tab to ensure all the required information is entered. Click “OK” once both tabs have been completed.

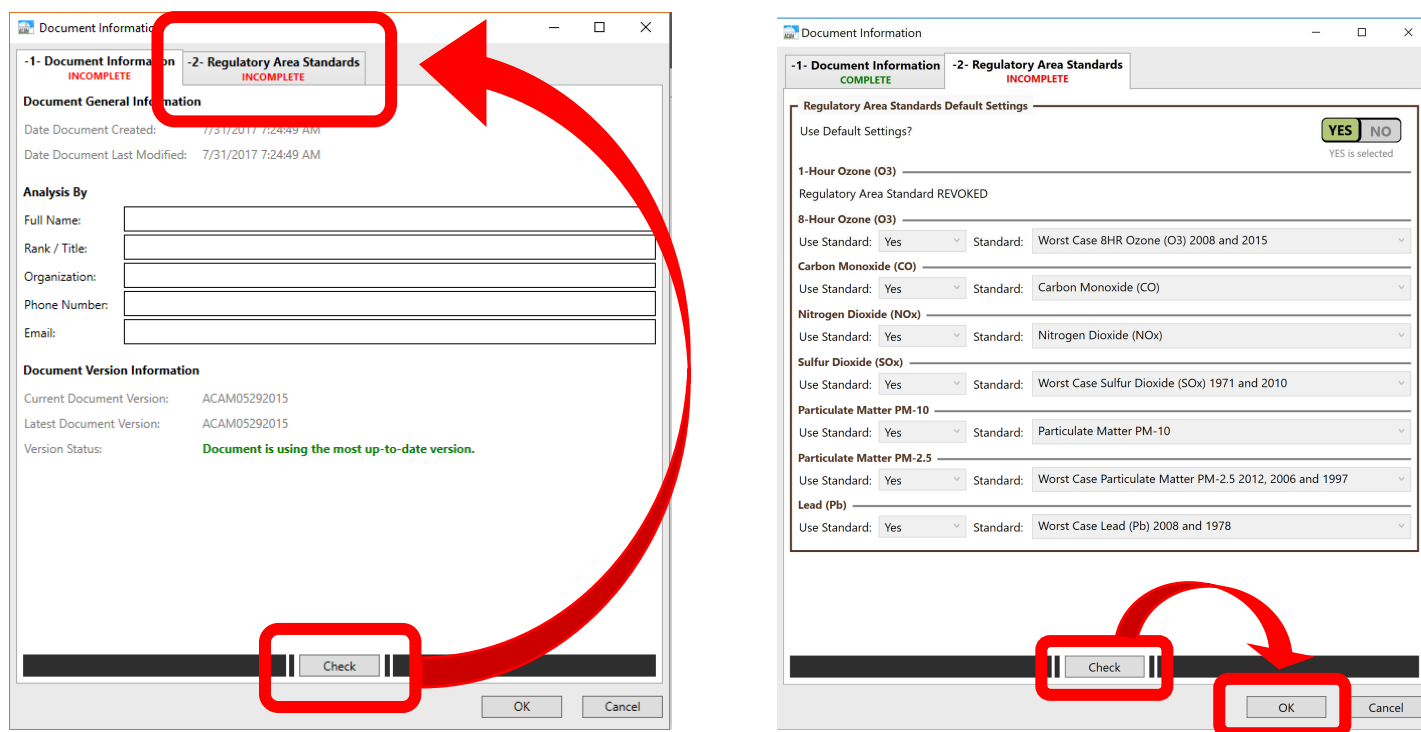


Figure 3.4 - Document Information Window



NOTE: Once this step is completed, the save warning in Figure 3.5 (left) will pop up anytime the document is changed. Clicking it updates the changes made to the document.

STEP 3: Select Desired Air Force Base

The next ACAM warning in the status panel to be addressed is shown in Figure 3.5 (left). Clicking this warning, or by navigating to the “BASE” menu in the ribbon and clicking “Select” (Pictured in Figure 13B) opens a window allowing the user to select the Air Force Base the proposed action is taking place at.



Figure 3.5

Clicking on either of these buttons opens the window shown in Figure 3.6. The user should navigate through this list and then click on their desired base once they locate it in the list. The drop-down menus for filter and filter type can be utilized for easier location of the desired base. Click “OK” once the base is selected. Note that if a base is not present, there is a “Generic Base” option; likewise if a base is located overseas there is an “Overseas Base” option.

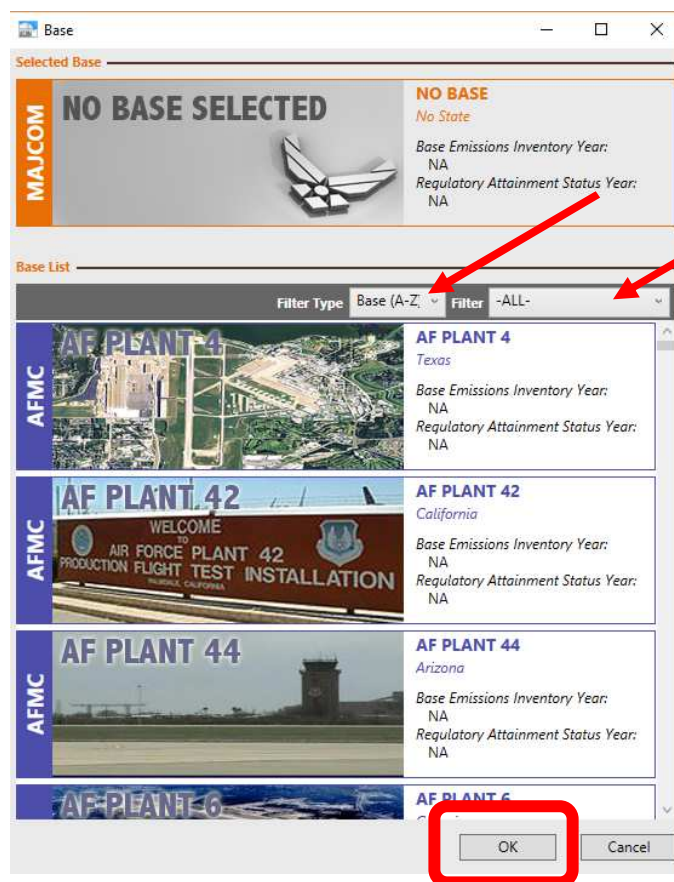


Figure 3.6 – Base Selection Window



NOTE: Once this step is completed, the save warning in Figure 3.1 (left) will pop up anytime the document is changed. Clicking it updates the changes made to the document.

STEP 4: Proposed Action Information

Step 4 requires the user to enter the Proposed Action Information. This is where the user will give an overview of the proposed action, as well as a title for ACAM report purposes. By clicking on either the warning in the ACAM Status Panel (Figure 3.7) or the USAF Action tab in the Workspace (Figure 3.8), the table shown in Figure 3.9 will be shown in the Workspace

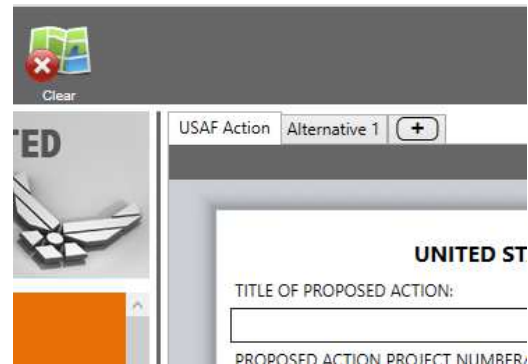


Figure 3.7 – Proposed Action Warning

Figure 3.8 – Proposed Action Tab

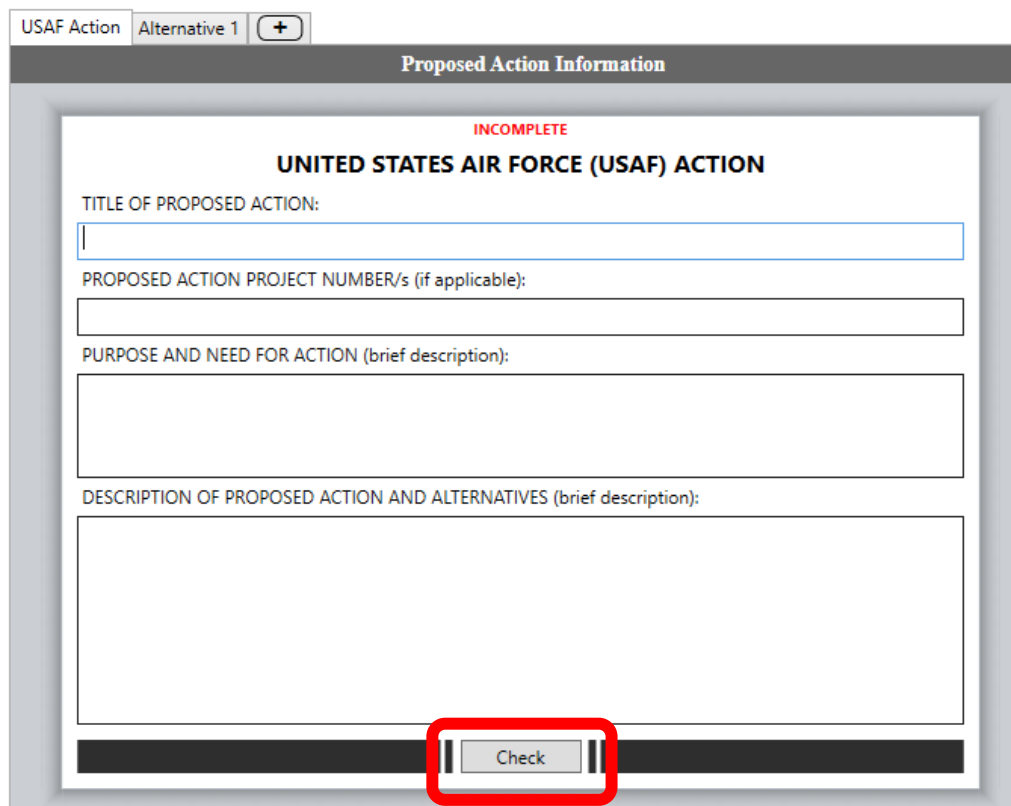
A screenshot of a web form titled "Proposed Action Information". At the top, it says "INCOMPLETE" in red. Below that is the heading "UNITED STATES AIR FORCE (USAF) ACTION". The form contains four text input fields: "TITLE OF PROPOSED ACTION:", "PROPOSED ACTION PROJECT NUMBER/s (if applicable):", "PURPOSE AND NEED FOR ACTION (brief description):", and "DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES (brief description):". At the bottom right, there is a "Check" button highlighted with a red rectangle. The "USAF Action" tab is selected in the top left.

Figure 3.9 – Proposed Action Information

Type all the required information in the respective text boxes, then click “Check”.



NOTE: Once this step is completed, the save warning in Figure 11A will pop up anytime the document is changed. Clicking it updates the changes made to the document.

STEP 5: Add All Desired Activities

Step 5 is perhaps the most important step in the process of creating an ACAM document. This step is where the user will add all the necessary activities related to the proposed action. Clicking the warning in the Status Panel (Figure 3.10, left) or by clicking the “INSERT” menu tab (Figure 3.10, right) in the ribbon displays all the options for activities in ACAM (Figure 3.11).



Figure 10

It is recommended the user review their proposed action documentation and construct a list of all proposed actions for a given Alternative. Once this list has been constructed, click on the desired activity(s) for the proposed action. All the Activities in ACAM are shown below in Figure 3.11.



Figure 3.11 – ACAM Activities

Clicking on the desired icon (located in the ribbon) opens that activity’s corresponding window. The user will need to complete each numbered tab in numerical order by entering in the appropriate data and reviewing the default data settings to ensure they adequately reflect the proposed action. Each time a tab is completed, click “Check” to ensure all required information is entered.

This step will need to be repeated until all activities are added or removed from the desired Alternative in ACAM.



NOTE: Each time an activity is added or altered, the save warning in Figure 3.1 (left) will pop up in the Status Panel of ACAM. Clicking it updates the changes made to the document.

The steady state warning that will appear after each activity is added or altered will be discussed in Step 6.

STEP 6: Calculate Steady State

A steady state calculation **must** be done before producing an ACAM Report; however, it is recommended to calculate steady state each time the warning (Figure 3.12) presents itself in the Status Panel of ACAM.



Figure 3.12 – “Steady State Calculation” Warning

Clicking this button calculates steady state. The user can also calculate steady state manually by navigating to the “Timeline View” via the “VIEW” menu in the ribbon, and clicking the steady state button in the Workspace as shown in Figure 3.13.



Figure 3.13 – Steady State Button



NOTE: Once this step is completed, the save warning in Figure 3.1 (left) will pop up anytime the document is changed. Clicking it updates the changes made to the document.

STEP 7: Analyze Proposed Action

Once the user has added all relevant activities and calculated steady state for a proposed action, the user should now review the emission totals from the proposed action. As previously discussed in this guide, it is beneficial to use the List View under the “VIEW” menu in the ACAM ribbon to review emission totals from each given activity; and it is useful to utilize the Timeline View so see emission totals for all activities for the year(s) being analyzed. Figure 3.14 displays an example of activities in the List View, and 3.15 displays the same activities in the Timeline View.

The screenshot shows the ACAM List View interface. At the top, there are tabs for 'USAF Action' and 'Alternative 1', along with a '+' button. The main title is 'List View'. Below this, there is a section for 'ALL EPA REGULATORY AREAS'. The activities are listed in a table-like format. Each activity has a color-coded header (AC, CD, HT), a description, and a table of emissions for 1 year (Tons/Year). The F-5 activity is highlighted with a red box around its EDIT and DELETE buttons.

Activity	Start Date	End Date					
AC F-5	1/2018	INDEF					
Activity Description Example for ACAM Quick Start Guide							
Activity Emission for 1 Year (Tons/Year)							
VOC	NOx	CO	SOx	PM 10	PM 2.5	Pb	NH3
1.82	0.61	5.59	0.13	0.63	0.28	0	0

Activity	Start Date	End Date					
CD ACAM Example Construction	1/2018	3/2018					
Activity Description ACAM Example for Quick Start Guide							
Demolition Phase Total Emissions (Tons)							
VOC	NOx	CO	SOx	PM 10	PM 2.5	Pb	NH3
0.05	0.3	0.3	0	0.02	0.02	0	0

Activity	Start Date	End Date					
HT ACAM Example	1/2018	INDEF					
Activity Description ACAM Example for Quick Start Guide							
Activity Emission for 1 Year (Tons/Year)							
VOC	NOx	CO	SOx	PM 10	PM 2.5	Pb	NH3
0.04	0.64	0.54	0	0.05	0.05	0	0

Figure 3.14 – Activity List View

In the List View, the user can utilize the “EDIT” button to the left of each individual activity to review any inputted data or make any changes.

The “DELETE” button can be used to remove an activity entirely. **Use caution when deleting an activity, as it cannot be recovered and the user will have to re-enter all information should it be necessary to add the deleted activity back.**

The Timeline View gives the user the option to adjust the start dates for an activity by clicking the “L” and “R”. This allows the user to reanalyze emission totals by time. Since emission thresholds or indicators are relevant for one year, having the ability to alter the activities by time allows the user to explore other alternatives if the proposed action is exceeding a threshold.

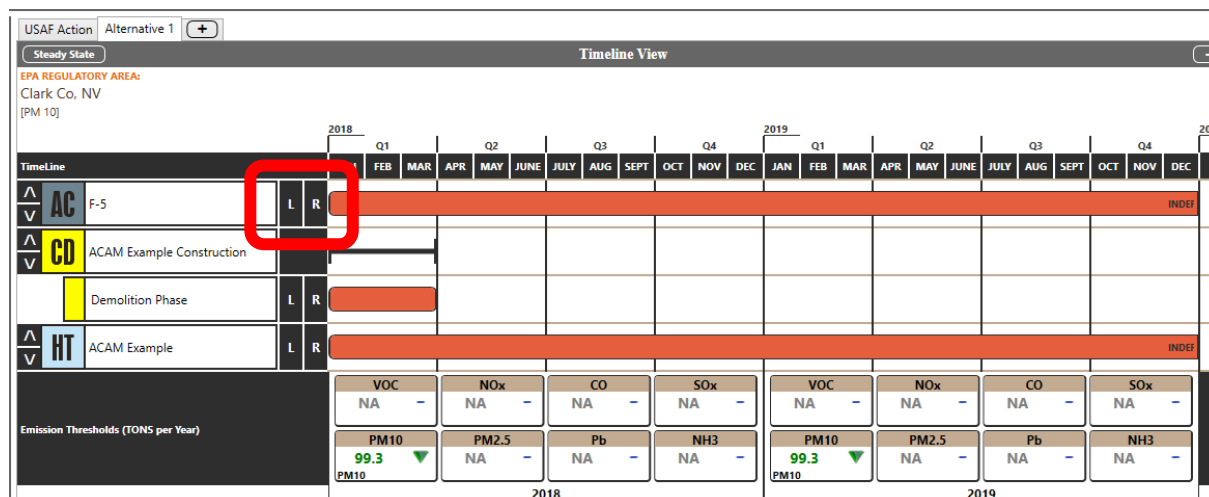


Figure 3.15 – Timeline View



NOTE: Once this step is completed, the save warning in Figure 3.1 (left) will pop up anytime the document is changed. Clicking it updates the changes made to the document, if any were made.

STEP 8: Re-Calculate Steady State

Step 8 is identical to Step 6. If any changes were made to the activities in Step 7, the user will be prompted with the ACAM warning to calculate steady state (Figure 3.16).

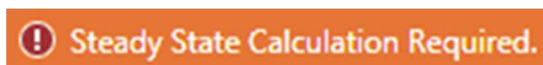


Figure 3.16 – “Steady State Calculation Required” Button

Clicking on this button will re-calculate steady state just as it did before. After clicking, the user will be shown another warning requiring the document to be saved.

STEP 9: Creating the ACAM Report(s)

Once all the information has been reviewed by the user and steady state for the finalized data has been calculated, the user can now create an ACAM Report. As mentioned before in the Basic ACAM Operations section of this guide, there are two types of ACAM Reports that can be generated. The process for generating a report, regardless of which one(s) selected by the user is identical. The user should navigate to the “REPORTS” menu in the ribbon. Clicking the “MS Report” button shown in Figure 3.17, brings forth the window shown in Figure 3.18.



Figure 3.17 – ACAM Report Icon

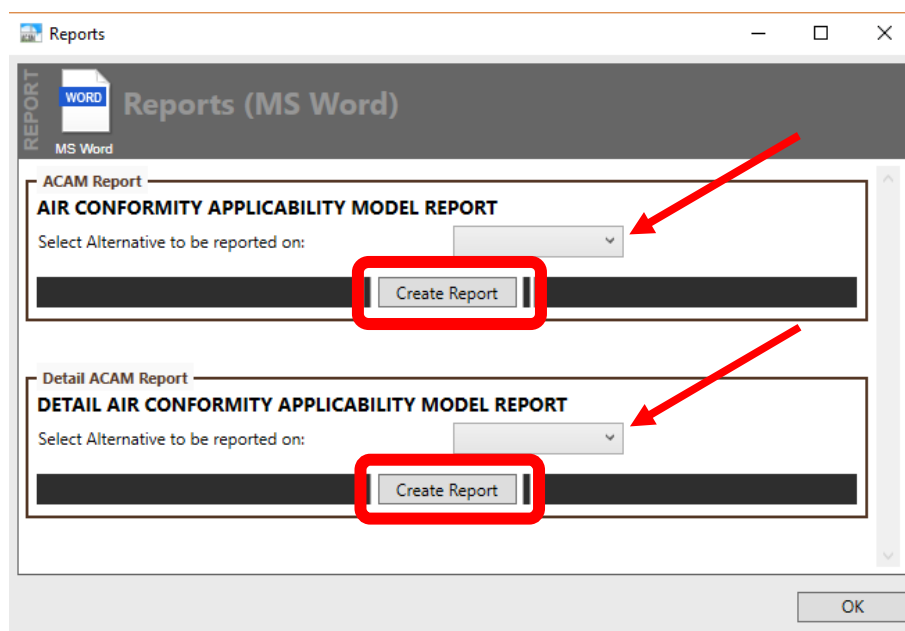


Figure 3.18 – ACAM Report Window

By utilizing the drop-down menus for the Detail and Summary report respectively, the user can select which Alternative in ACAM he or she wishes to create a report for. Clicking the “Create Report” button within the desired report type’s tab work area will create the report in word document form.

The user will be presented with the save window shown in Figure 3.20.

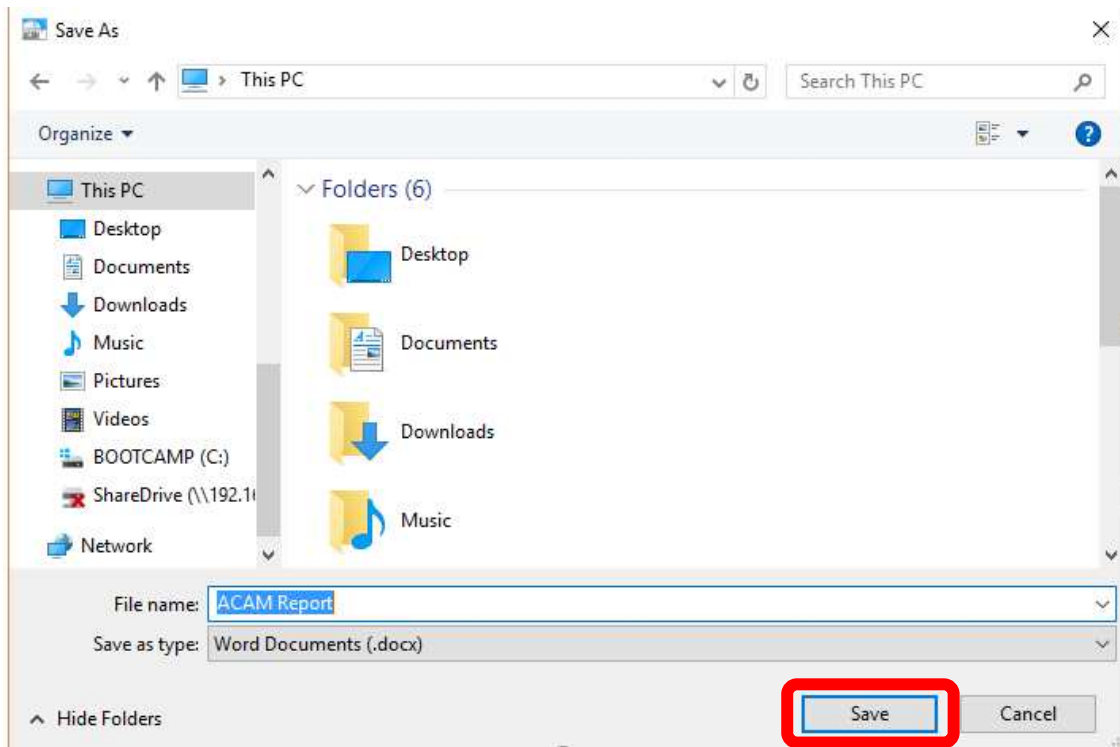


Figure 3.20 – ACAM Report Save Menu

The user will need to name the ACAM Report and select a location to save it on their PC. Once the file has been named and a location is selected, click “Save” to close the window.

The user has now completed all the steps to create an ACAM file. The ACAM report(s) as well as the ACAM File can be shared with other individuals. The ACAM file can also be altered in anyway the user deems necessary based upon the data presented in the report(s). Any changes should follow the general 9 step process discussed in this guide. Once any changes are made to the file a new ACAM report(s) can be created.

4: CONSTRUCTION CASE STUDY

Introduction

Construction activities are often associated with proposed actions of the USAF. ACAM fully automates most construction activities a user may need to estimate emissions for in a proposed action. ACAM includes, Demolition, Site Grading, Excavating and Trenching, Building Construction, Architectural Coatings, and Paving (asphalt). This case study provides a general overview of how to use the construction activity module in ACAM.

To begin, select the “Const/Demo” icon in the Ribbon, pictured in Figure 4.1.



Figure 4.1 – Construction and Demolition Activity

General Information

Selecting the Const/Demo icon will bring forth the ACAM window pictured in Figure 4.2. The user should begin with tab 1 titled General Information. It should be noted that the General Information is different for Construction / Demolition than for every other activity since the duration of each construction phase needs to be individually known.

Figure 4.2 - Construction and Demolition General Information Tab

Begin by using the drop-down menu to the right of “Alternative to Add/Remove Activity to” to determine which Alternative scenario the activity will be added or removed to.

It is now required to give the activity a title. ACAM limits the title to 100 characters or less. It is recommended to keep the title as concise as possible. If the user wishes to make more in depth notes regarding the activity, they can be listed in the Activity Description text box. It should be noted that this text box is not required to proceed, and its use is optional.

Once completed select “Check” located at the bottom middle of the Construction and Demolition Activity window. If the minimum amount of required has been correctly inputted as per the instructions given, tab 1 will display “Complete” under its title as shown in Figure 4.3.

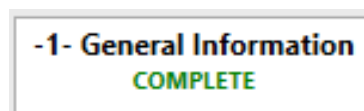


Figure 4.3 – General Information Tab ‘Complete’

Activity Phases

Now Proceed to tab 2, titled “Activity Phases” by clicking it. This window, pictured in Figure 4.4, will give the options for certain activities involved in the construction or demolition of a structure. The user should verify which of the activities will be necessary before proceeding with the scenario, and it is important to think about

the analysis logically. For instance, building construction will almost always require site grading, excavating and trenching, and architectural coatings. Analyze each phase as applicable to the proposed project at hand.

Figure 4.4 – Construction Activity Phases Toggled OFF

As shown above, all the Activity Phases will default to “NO” which indicates that the phase’s emission sources will not be included in the ACAM calculations. In order to include an activity phase, click the YES-NO tab and be sure that “YES” appears in black lettering and green back ground as shown in Figure 4.5.



Figure 4.5 – “YES NO” Toggle

After selecting all the appropriate select “Check” located at the bottom middle on the Construction and Demolition Activity window. At this point, a number of new tabs will appear at the top of the window. Depending upon which Activity Phases were selected in tab 2, the number of additional tabs will differ. For instructional purposes, all the options for the Activity Phase were selected, as shown in Figure 4.6.

Construction And Demolition

Construction And Demolition Activity

-6- Building Construction INCOMPLETE	-7- Architectural Coatings INCOMPLETE	-8- Paving (Asphalt) INCOMPLETE	-9- Activity Location INCOMPLETE
-1- General Information COMPLETE	-2- Activity Phases COMPLETE	-3- Demolition INCOMPLETE	-4- Site Grading INCOMPLETE
		-5- Trenching INCOMPLETE	

Demolition

YES

NO

YES is selected

Off-Gassing

Fugitive Dust

Construction Exhaust

Vehicle Exhaust

Worker Trips

Vendor Trips

Site Grading

YES

NO

YES is selected

Off-Gassing

Fugitive Dust

Construction Exhaust

Vehicle Exhaust

Worker Trips

Vendor Trips

Excavating / Trenching

YES

NO

YES is selected

Off-Gassing

Fugitive Dust

Construction Exhaust

Vehicle Exhaust

Worker Trips

Vendor Trips

Building Construction

YES

NO

YES is selected

Off-Gassing

Fugitive Dust

Construction Exhaust

Vehicle Exhaust

Worker Trips

Vendor Trips

Architectural Coatings

YES

NO

YES is selected

Off-Gassing

Fugitive Dust

Construction Exhaust

Vehicle Exhaust

Worker Trips

Vendor Trips

Paving (Asphalt)

YES

NO

YES is selected

Off-Gassing

Fugitive Dust

Construction Exhaust

Vehicle Exhaust

Worker Trips

Vendor Trips

Check

OK

Cancel

Figure 4.6 – Construction Activity Phases Toggled ON

Demolition

Selecting the Demolition tab by clicking on it will bring forth the options presented in Figure 4.7.

Construction And Demolition

CD Construction And Demolition Activity

-6- Building Construction INCOMPLETE	-7- Architectural Coatings INCOMPLETE	-8- Paving (Asphalt) INCOMPLETE	-9- Activity Location INCOMPLETE	
-1- General Information COMPLETE	-2- Activity Phases COMPLETE	-3- Demolition INCOMPLETE	-4- Site Grading INCOMPLETE	-5- Trenching INCOMPLETE

Phase Timeline

This Phase End Date: N/A

Phase Start Date

Start Month:

Starting Within: 1st Quarter of the Month

Start Year (yyyy):

Phase Duration (Includes Non-Working days.)

Number Of Months:

AND

Number Of Days: 0

General Demolition Information

Area of Building to be demolished (ft²):

Height of Building to be demolished (ft):

Demolition Default Settings

Use Default Settings? ☒ YES ☐ NO
YES is selected

Average Day(s) worked per week: 5

Construction Exhaust

Off-Road Equipment Selection: - COMPLETE -

Vehicle Exhaust

Average Hauling Truck Capacity (yd³): 20

Average Hauling Truck Round Trip Commute (mile): 20

Figure 4.7 Demolition Phase Tab Window

The user should start with the Phase Start Date followed by the Phase Duration, shown in Figure 4.8. It should be noted that this step is identical for each construction phase, and thus will only be discussed this one time.

Phase Start Date		Phase Duration (Includes Non-Working days.)	
Start Month:	<input type="text"/>	Number Of Months:	<input type="text"/>
Starting Within:	1st Quarter of the Month <input type="text"/>	AND	
Start Year (yyyy):	<input type="text"/>	Number Of Days:	0 <input type="text"/>

Figure 4.8 – Construction Activity Phasing

Using the drop-down menu to the right of “Start Month:”, select the month in which the demolition phase will begin. Proceed to the drop-down menu just below pertaining to “Starting Within” and choose the time period during the month selected when the demolition will begin. Finally, type the year for the phase start date in the text box to the right of “Start Year (yyyy):”. Continuing to refer to Figure 4.8, the Phase Duration must now be addressed. Type the number of months the demolition will last in its respective text box, and then using the drop-down menu select the number of days if it is not a whole – number of months. If the user is unsure about the time frame of each phase, a helpful tool to estimate construction phase durations can be found at <https://aqhelp.com/AQtools.html> and is titled “Construction Phase Duration & Date Estimator”.

The next information to provide is the Area of Building to be demolished in square feet, and the height of the building in feet. The length (L), width (W) and height (H) of the structure will need to be known, Refer to Figure 4.10.

General Demolition Information	
Area of Building to be demolished (ft ²):	<input type="text"/>
Height of Building to be demolished (ft):	<input type="text"/>

Figure 9 – Demolition Inputs

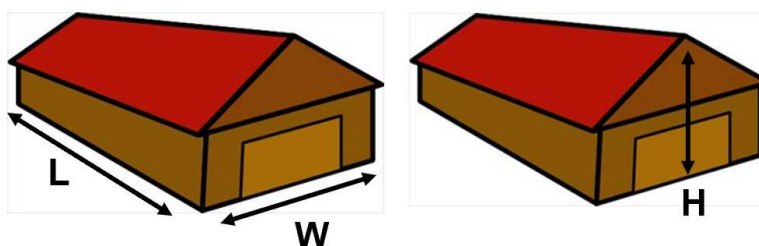


Figure 4.10 – Length, Width, and Height Diagram

Site Grading

Selecting the Site Grading tab by clicking on it will bring forth the options presented in Figure 4.11.

Construction And Demolition

CD

Construction And Demolition Activity

-6- Building Construction

INCOMPLETE

-7- Architectural Coatings

INCOMPLETE

-8- Paving (Asphalt)

INCOMPLETE

-9- Activity Location

INCOMPLETE

-1- General Information

COMPLETE

-2- Activity Phases

COMPLETE

-3- Demolition

COMPLETE

-4- Site Grading

INCOMPLETE

-5- Trenching

INCOMPLETE

Phase Timeline

This Phase End Date: N/A

Phase Start Date

Start Month:

Starting Within:

1st Quarter of the Month

Start Year (yyyy):

Phase Duration (Includes Non-Working days.)

Number Of Months:

AND

Number Of Days:

0

General Site Grading Information

Area of Site to be Graded (ft²):

Amount of Material to be Hauled On-Site (yd³):

Amount of Material to be Hauled Off-Site (yd³):

Site Grading Default Settings

Use Default Settings?

YES

NO

YES is selected

Average Day(s) worked per week:

5

Construction Exhaust

Off-Road Equipment Selection:

- COMPLETE -

Edit Off-Road Equipment

Vehicle Exhaust

Average Hauling Truck Capacity (yd³):

20

Average Hauling Truck Round Trip Commute (mile):

20

Worker Trips

Average Worker Round Trip Commute (mile):

20

Check

Re-Size Window

OK

Cancel

Figure 4.11 – Site Grading Phase Tab

Referring to Figure 4.12, the next information to provide is the Area of Site to be Graded, Amount of Material to be Hauled on site, and amount of material to be hauled off site. Type these values in their respective text boxes paying close attention to the units. Typically, Site Grading is calculated by doubling the foot print of the structure to be constructed. Occasionally, the user will know the entire ground area to be disturbed; if this is the case, use this value.

General Site Grading Information

Area of Site to be Graded (ft²):

Amount of Material to be Hauled On-Site (yd³):

Amount of Material to be Hauled Off-Site (yd³):

Figure 4.12 – Site Grading Inputs

Trenching

Selecting the Trenching tab will bring forth the options shown in Figure 4.13.

Construction And Demolition Activity

-6- Building Construction INCOMPLETE

-7- Architectural Coatings INCOMPLETE

-8- Paving (Asphalt) INCOMPLETE

-9- Activity Location INCOMPLETE

-1- General Information COMPLETE

-2- Activity Phases COMPLETE

-3- Demolition COMPLETE

-4- Site Grading COMPLETE

-5- Trenching INCOMPLETE

Phase Timeline

This Phase End Date: N/A

Phase Start Date

Start Month: [dropdown]

Starting Within: 1st Quarter of the Month [dropdown]

Start Year (yyyy): [text box]

Phase Duration (includes Non-Working days.)

Number Of Months: [text box]

AND

Number Of Days: 0 [dropdown]

General Excavating / Trenching Information

Area of Site to be Trenched (ft²): [text box]

Amount of Material to be Hauled On-Site (yd³): [text box]

Amount of Material to be Hauled Off-Site (yd³): [text box]

Excavating / Trenching Default Settings

Use Default Settings? YES NO YES is selected

Average Day(s) worked per week: 5 [dropdown]

Construction Exhaust

Off-Road Equipment Selection: - COMPLETE - Edit Off-Road Equipment

Vehicle Exhaust

Average Hauling Truck Capacity (yd³): 20 [text box]

Check OK Cancel

Figure 4.13 – Trenching Phase Tab

Referring to Figure 4.14 the next information to provide is the Area of Site to be Trenched in square feet, Amount of Material to be Hauled On-Site in cubic yards and Amount of Material to be Hauled Off-Site in cubic yards. Type these values in their respective text boxes. To calculate the area of the site to be trenched, the linear foot length of the trench needs to be known, along with the width the trench will be. A safe, conservative, assumption that trenches will be 3 feet wide.

General Excavating / Trenching Information

Area of Site to be Trenched (ft²): [text box]

Amount of Material to be Hauled On-Site (yd³): [text box]

Amount of Material to be Hauled Off-Site (yd³): [text box]

Figure 4.14 – Excavating/Trenching Inputs

Building Construction

Selecting the Building Construction tab by clicking on it will bring forth the options presented in Figure 4.15.

The screenshot shows the 'Construction And Demolition Activity' window. At the top, there's a progress bar with tabs: -1- General Information (COMPLETE), -2- Activity Phases (COMPLETE), -3- Demolition (COMPLETE), -4- Site Grading (COMPLETE), -5- Trenching (COMPLETE), -6- Building Construction (INCOMPLETE), -7- Architectural Coatings (INCOMPLETE), -8- Paving (Asphalt) (INCOMPLETE), and -9- Activity Location (INCOMPLETE). Below this, the 'Phase Timeline' section shows 'This Phase End Date: N/A'. The 'Phase Start Date' section includes 'Start Month', 'Starting Within' (set to '1st Quarter of the Month'), and 'Start Year (yyyy)'. The 'Phase Duration' section includes 'Number Of Months' and 'Number Of Days' (set to 0). The 'General Building Construction Information' section, highlighted with a red rectangle, contains 'Building Category' (set to 'Multi-Family'), 'Number of Units', 'Area of Building (ft²)', and 'Height of Building (ft)'. Below this is the 'Building Construction Default Settings' section, which includes a 'Use Default Settings?' toggle (set to 'YES'), 'Average Day(s) worked per week' (set to 5), 'Construction Exhaust' status (set to 'COMPLETE'), and several trip commute input fields: 'Average Hauling Truck Round Trip Commute (mile)' (20), 'Average Worker Round Trip Commute (mile)' (20), and 'Average Vendor Round Trip Commute (mile)' (40). At the bottom, there are 'Check', 'OK', and 'Cancel' buttons.

Figure 4.15 – Building Construction Phase Tab

The area of the building (foot print, not living space/interior square footage) must be provided in square feet, followed by the height of the building and finally the number of units being constructed. Type these values in their respective text boxes shown in Figure 4.16. Depending on the type of building category selected, different inputs must be provided. For instance, if Single Family Housing is selected, the height is not required, just the building's foot print and the number of units. A helpful hint is to assume 10 feet per story if the building height is unknown.

This is a close-up of the 'General Building Construction Information' section. It shows the 'Building Category' dropdown menu set to 'Multi-Family'. To its right is the 'Number of Units' input field. Below these are the 'Area of Building (ft²)' and 'Height of Building (ft)' input fields.

Figure 4.16 – Building Construction Inputs

Architectural Coatings

Selecting the Architectural Coatings will display the information shown in Figure 4.17.

The screenshot shows a software window titled "Construction And Demolition Activity". At the top, there is a tabbed interface with nine tabs: -1- General Information (COMPLETE), -2- Activity Phases (COMPLETE), -3- Demolition (COMPLETE), -4- Site Grading (COMPLETE), -5- Trenching (COMPLETE), -6- Building Construction (COMPLETE), -7- Architectural Coatings (INCOMPLETE), -8- Paving (Asphalt) (INCOMPLETE), and -9- Activity Location (INCOMPLETE). The "-7- Architectural Coatings" tab is selected. Below the tabs, there is a "Phase Timeline" section with a "This Phase End Date: N/A" and a "Phase Start Date" section with fields for "Start Month", "Starting Within" (set to "1st Quarter of the Month"), and "Start Year (yyyy)". To the right is a "Phase Duration" section with fields for "Number Of Months" and "Number Of Days" (set to 0). Below these is the "General Architectural Coating Information" section, which is highlighted with a red box. It contains a "Building Category" dropdown menu (set to "Multi-Family"), a "Number of Units" text box, and a "Total Square Footage (ft²)" text box. Below this is the "Architectural Coating Default Settings" section, which includes a "Use Default Settings?" toggle (set to "YES"), a field for "Average Day(s) worked per week" (set to 5), and a field for "Average Worker Round Trip Commute (mile)" (set to 20). At the bottom of the window are "Check", "OK", and "Cancel" buttons.

Figure 4.17 – Architectural Coatings Phase Tab

Referring to Figure 4.18 below, the building category must be selected using its respective drop-down menu. The total exterior surface area square footage of the building and the total number of building units must also be provided by typing these values in their respective text boxes, depending on the building category selected. As a helpful hint, occasionally only the foot print of the building is known. In this instance, assume the building is a square (length = width), and like in previous construction phases assume 10 feet per story.

This is a close-up of the "General Architectural Coating Information" section from the screenshot in Figure 4.17. It shows the "Building Category" dropdown menu set to "Multi-Family", the "Number of Units" text box, and the "Total Square Footage (ft²)" text box.

Figure 4.18 – Architectural Coatings Inputs

Paving

Selecting the paving tab will bring forth the options in the Construction And Demolition Activity window pictured in Figure 4.19.

The screenshot shows the 'Construction And Demolition Activity' window with the 'Paving (Asphalt)' tab selected. The window has a title bar with a yellow 'CD' icon and the text 'Construction And Demolition'. Below the title bar is a tabbed interface with the following tabs: '-1- General Information COMPLETE', '-2- Activity Phases COMPLETE', '-3- Demolition COMPLETE', '-4- Site Grading COMPLETE', '-5- Trenching COMPLETE', '-6- Building Construction COMPLETE', '-7- Architectural Coatings COMPLETE', '-8- Paving (Asphalt) INCOMPLETE', and '-9- Activity Location INCOMPLETE'. The 'Paving (Asphalt)' tab is highlighted. Below the tabs is a 'Phase Timeline' section with 'This Phase End Date: N/A'. The 'Phase Start Date' section includes 'Start Month:', 'Starting Within:' (set to '1st Quarter of the Month'), and 'Start Year (yyyy):'. The 'Phase Duration' section includes 'Number Of Months:' and 'Number Of Days:' (set to 0). Below this is the 'General Paving (Asphalt) Information' section, which is highlighted with a red rectangle. It contains a 'Paving Area (ft²):' text box. Below that is the 'Paving (Asphalt) Default Settings' section, which includes a 'Use Default Settings?' toggle (set to 'YES'), 'Average Day(s) worked per week:' (set to 5), 'Construction Exhaust' section with 'Off-Road Equipment Selection:' (set to '- COMPLETE -') and 'Vehicle Exhaust' section with 'Average Hauling Truck Capacity (yd³):' (set to 20), 'Average Hauling Truck Round Trip Commute (mile):' (set to 20), and 'Worker Trips' section with 'Average Worker Round Trip Commute (mile):' (set to 20). At the bottom of the window are 'Re-Size Window', 'Check', 'OK', and 'Cancel' buttons.

Figure 4.19 – Paving Phase Tab

Referring to Figure 4.20, the paving area must be inputted in square feet in its respective text box.

This figure is a close-up of the 'General Paving (Asphalt) Information' section. It shows the 'Paving Area (ft²):' label followed by an empty text box for input. The text 'General Paving (Asphalt) Information' is in orange and is followed by a horizontal line.

Figure 4.20 – Paving Input

5: AIRCRAFT FLIGHT OPERATIONS CASE STUDY

Introduction

ACAM is currently the only USAF approved tool that can handle all emissions generating activities resulting from fixed-wing aircraft including Flight Operations, Aerospace Ground Equipment (AGE), and Engine Test Cell. ACAM includes a list of nearly all fixed wing USAF aircraft with approved default values for different aircraft engine settings in order to keep the analysis as simple as possible. Default values and equipment for Auxiliary Power Unit (APU), Engine Test Cell, and AGE are preloaded into the ACAM Aircraft Activity. This case study will walk the user through the Aircraft activity tab in ACAM.

General Aircraft Terminology

Before proceeding into the ACAM analysis, a basic understanding of aircraft terminology relating to air quality is necessary. It is important to note that aircraft operations are calculated differently for noise and air and cannot be used interchangeably.

Landing and Takeoff Cycle (LTO)

The EPA has established formal procedures for calculating exhaust emissions associated with aircraft operations based on a Landing and Takeoff (LTO) cycle (USEPA 1992). Under the EPA procedures, an emissions inventory for aircraft operations focuses on the emissions in the vertical column (generally bound by the perimeter of the base) of air referred to as the “mixing zone” or “inversion layer”. Exhaust emissions occurring within this area are calculated for one complete LTO cycle for each aircraft type by applying aircraft engine-specific emission factors (EFs). These EFs are derived from fuel flow rates, and the period of time (or time-in-mode, TIM) that each engine operates at a power setting during an LTO. Additionally, EFs are derived from the activity based operational data such as the number of aircraft, the number of engines per aircraft, the annual number of sorties or LTOs, etc. Emissions occurring above the mixing zone are typically not considered during the emissions inventory process.

Each LTO cycle for fixed-wing aircraft is comprised of five operating modes/power settings: taxi/idle out, takeoff, climb out, approach, and taxi/idle in. The five operating modes and corresponding TIM are described below:

- Taxi/Idle Out: The time from engine startup to takeoff.
- Takeoff: Characterized by full engine thrust, the time it takes the aircraft to reach between 500 and 1,000 feet above ground level. This transition height is typical and does not vary much from location to location or among aircraft categories.
- Climb Out: The time following takeoff that concludes when an aircraft exits the mixing zone and continues to cruise altitude.
- Approach: The time from the moment the aircraft enters the mixing zone until the aircraft lands.
- Taxi/Idle In: The time spent after landing until the aircraft is parked and the engines are turned off.

Figure 5.1 shows the components of a typical LTO cycle.

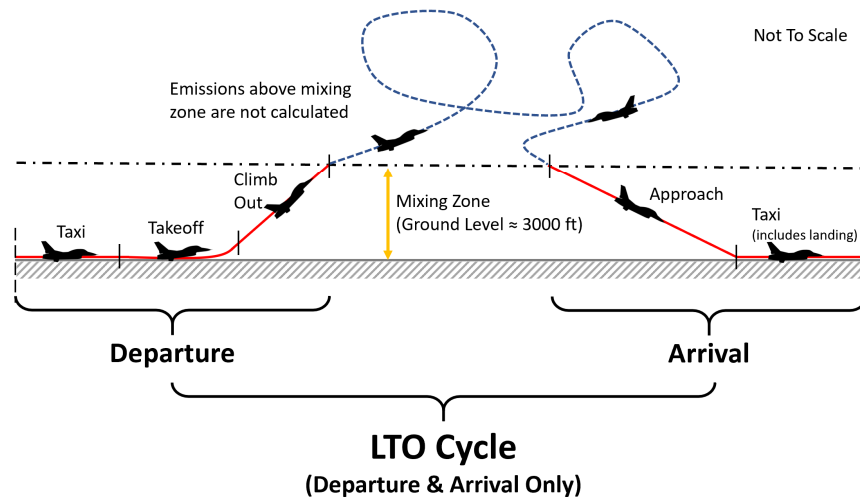


Figure 5.1 – Landing Take Off Cycle

Touch and Go Cycle

A Touch and Go Cycle contains the components of an LTO cycle but differs in that there is no takeoff or taxi for the aircraft. The aircraft approaches the runway and either touches the runway with the landing gear of the aircraft or comes very close to it, and then transitions into climb out. This type of operation is frequently conducted for training purposes.

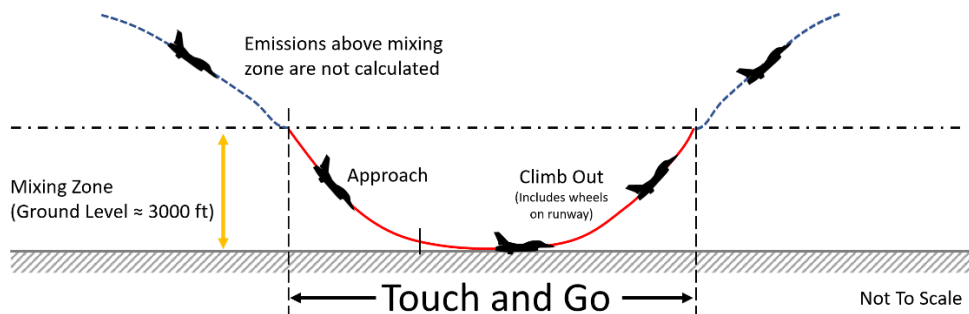


Figure 5.2 Touch and Go Cycle

4.1.3 Auxiliary Power Unit (APU)

APU provides power to an aircraft while it is on the ground and sometimes through takeoff and climb out. APUs are turbine-powered generators, usually ranging in size from 50-400 horsepower, and they burn JP-8 fuel thus causing them to be an emissions source within the mixing zone that will need to be accounted for depending on the aircraft activity type.

Aircraft Activity Overview

To begin an Aircraft Activity in ACAM, select the Aircraft Activity button as shown in Figure 5.3.



Figure 5.3 – Aircraft Activity Button

General Information

Selecting the Aircraft Activity icon will bring forth the ACAM window pictured in Figure 4.3. The user should begin with tab 1, titled General Information

Figure 5.4 – Aircraft Activity Window

The user should work down from top to bottom, making sure each information entry is filled in.

The user should first use the drop-down menu pictured in Figure 5.4 to inform if they are adding or removing aircraft from the base by selecting “Add” or “Remove” respectfully. Then the Alternative scenario should be selected to add or remove the activity to. It is now required to give the activity a title.

ACAM limits the title to 100 characters or less. It is recommended to keep the title as concise as possible. If the user wishes to make more in depth notes regarding the activity, they can be listed in the Activity Description text box.

The user will now need to state the time frame for the activity. The user first needs to determine if the activity is indefinite. If it is, be sure the button in the Activity Timeline is showing “YES” highlighted in green as shown in Figure 4.4. if it is not indefinite, be sure “NO” is selected as it is in Figure 4.3.

Figure 5.5 – Activity Indefinite Tab

Next the Activity Start Date and Activity End Date are required. If the activity is indefinite, only an activity start date needs to be inputted. Referring to Figure 5.6, the start month and end month will be selected using the drop-down menu. The start year and end year should be typed in their respective text boxes in the format yyyy.

Activity Start Date	Activity End Date
Start Month: <input type="text"/>	End Month: <input type="text"/>
Start Year (yyyy): <input type="text"/>	End Year (yyyy): <input type="text"/>

Figure 5.6 – Activity Phasing

After entering in the dates, select the “Check” button. If the previous instructions were followed and the correct formatting was used where necessary, the General Information tab will display that it is complete in green lettering as shown in Figure 5.7.

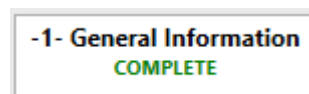


Figure 5.7 – General Information Complete

Activity Type

The user will now select tab 2 titled Activity Type. Selecting this tab will bring forward the options shown in Figure 5.8. All the Activity Types will default to “NO”, the user will click the button to toggle on an Activity Type. For the purposes of this case study, all types are toggled on (as shown in Figure 5.8).

The screenshot shows a software window titled "Aircraft" with a sub-header "AC Aircraft Activity". Below the header are three tabs: "-1- General Information COMPLETE", "-2- Activity Type INCOMPLETE", and "-3- Activity Location INCOMPLETE". The main content area is divided into three sections, each with a title, a description, a question, and a selection button.

Activity Type	Description	Question	Selection
Flight Operation	Calculates emissions from aircraft sortie(s) and from aircraft auxiliary power unit(s).	Are you Adding/Removing Flight Operation(s)?	YES (selected)
Engine Test Cell	Calculates emissions from engine test cell(s) activities.	Are you Adding/Removing Engine Test Cell(s)?	YES (selected)
Aerospace Ground Equipment	Calculates emissions from aerospace ground equipment(s) activities.	Are you Adding/Removing Aerospace Ground Equipment (AGE)?	YES (selected)

At the bottom of the window, there is a "Check" button and "OK" and "Cancel" buttons.

Figure 5.8 – Activity Type

Three Activity Types are presented: Flight Operation, Engine Test Cell, and Aerospace Ground Equipment. Determine which options are relevant to the aircraft activity being conducted. Selecting “YES” will include emissions or the relevant sources, and selecting “NO” excludes those emissions from the activity. At least one activity must be selected to continue. In order to continue, select “Check”. Regardless of which Activity(s) are selected.

Selecting check will change the layout of the window by adding additional tabs. The tabs will differ depending on which emissions activities were selected in tab 2. Figure 5.9 displays the tabs as if the user selected all the activity emissions. If not all the activity emissions were selected, there will be less tabs. A list shown below gives an overview of which tabs will appear depending on the Activity Type selection:

Flight operations:

- Aircraft & Engine
- Flight Operation(s)

- APU

Engine Test Cell:

- Aircraft & Engine
- Engine Test Cell(s)

Aerospace Ground Equipment:

- AGE

The screenshot shows a software window titled "Aircraft" with a sub-header "Aircraft Activity". Below the header is a tabbed interface with four tabs: "-1- General Information" (COMPLETE), "-2- Activity Type" (COMPLETE), "-3- Aircraft & Engine" (INCOMPLETE), and "-4- Flight Operation(s)" (INCOMPLETE). The "-2- Activity Type" tab is active. It contains three sections: "Flight Operation" (Calculates emissions from aircraft sortie(s) and from aircraft auxiliary power unit(s)), "Engine Test Cell" (Calculates emissions from engine test cell(s) activities), and "Aerospace Ground Equipment" (Calculates emissions from aerospace ground equipment(s) activities). Each section has a question "Are you Adding/Removing [Activity Name]?" and a "YES" button (selected) and a "NO" button. Below these sections is a "Check" button. At the bottom of the window are "OK" and "Cancel" buttons.

Figure 5.9 – Activity Type (All Selected)

Aircraft and Engine

Proceeding in numerical order, tab 3 will be used to select the aircraft and engine. The aircraft are listed in alphabetical order, and the user should use caution when selecting the aircraft because many of the same aircraft models have different engines.

Aircraft Activity

-5- APU: INCOMPLETE
 -6- Engine Test Cell(s): INCOMPLETE
 -7- AGE: INCOMPLETE
 -8- Activity Location: INCOMPLETE
 -1- General Information: COMPLETE
 -2- Activity Type: COMPLETE
 -3- Aircraft & Engine: INCOMPLETE
 -4- Flight Operation(s): INCOMPLETE

Aircraft and Engine Selection

Primary Function: -ALL- # of Engines: -ALL- Engine Type: -ALL- [Filter] [Reset]

Aircraft & Engine Selection List		
Primary Function	Designation	Engine Model
Combat	A-10	TF34-GE-100A
Combat	A-10	TF34-GE-400
Combat	A-10A	TF34-GE-100
Combat	A-10C	TF34-GE-100
Combat	A-37	J69-T-25
Combat	A-3A	J57-P-68
Combat	A-3B	J57-P-10
Combat	A-4	J52-P-2
Combat	A-4	J52-P-8
Combat	A-4	J65-W-2
Combat	A-4	J65-W-4
Combat	A-4C	J65-W-16A
Combat	A-4C	J65-W-20
Combat	A-4E	J52-P-6A
Combat	A-4E	J52-P-8A

Selected Aircraft & Engine

Aircraft Designation: None
 Popular Name: None
 Engine Model: None
 Engine Type: None
 Number of Engines: None

Aircraft and Engine Surrogate

Is selected Aircraft and Engine a surrogate? [No]

Original Aircraft Name: [] Original Engine Name: []

[Check] [OK] [Cancel]

Figure 5.10 – Aircraft and Engine

If the user cannot locate the aircraft, a surrogate aircraft will need to be utilized. ACAM contains a viable surrogate for nearly every fixed wing aircraft. If assistance is required in finding a viable surrogate, contact AFCEC/CZTQ.

After finding a suitable surrogate with similar engine specifications, use the drop-down menu shown in Figure 5.10 and select “Yes” to tell ACAM that it is a surrogate. Also, the original aircraft name and original engine name need to be provided in their respective text boxes (Figure 5.11).

Aircraft and Engine Surrogate

Is selected Aircraft and Engine a surrogate? [No]

Original Aircraft Name: [] Original Engine Name: []

[Check] [OK] [Cancel]

Figure 5.11 – Aircraft Surrogate Information (if applicable)

Once the aircraft and relevant surrogate information is provided if necessary, select check and proceed to the next tab.

Flight Operations

The flight operations tab is pictured in Figure 5.12.

Aircraft Activity

-1- General Information COMPLETE	-2- Activity Type COMPLETE	-3- Aircraft & Engine COMPLETE
-4- Flight Operation(s) INCOMPLETE	-5- APU INCOMPLETE	-6- Activity Location INCOMPLETE

Flight Operations

Number of Aircraft:

Number of Annual LTOs (Landing and Take-off) cycles for all Aircraft:

Number of Annual TGOs (Touch-and-Go) cycles for all Aircraft:

Flight Operations / Trim Test(s) Default Settings

Use Default Settings? **YES** **NO**
YES is selected

Flight Operations TIMs

TIME IN MODE	
Taxi/Idle Out (mins):	18.5
Takeoff MIL (mins):	0.4
Climb Out (mins):	0.8
Takeoff AB (mins):	0
Taxi/Idle In (mins):	11.3
Approach (mins):	3.5

Trim Test(s)

Number of Annual Trim Test(s) Per Aircraft:

POWER SETTING TEST DURATION

Idle (mins):	12	Approach (mins):	27
Intermediate (mins):	9	Military (mins):	12
Afterburner (mins):	0		

Check

OK **Cancel**

Figure 5.12 – Flight Operations Tab

The total number of aircraft as a result of the action (of a specific type) should be entered in the first text box, along with the number of LTOS and TGOs as applicable to the definitions presented earlier. **It should be noted that the values entered for LTOs and TGOs are for all aircraft of a type meaning that it is a total value, not an individual value for each aircraft.** If there are more than one type of aircraft resulting from a proposed action, multiple Aircraft Activities must be present in ACAM.



NOTE: The default Time in Modes for flight operations are only valid for general screening purposes, and for temporary beddown of aircraft. If a major beddown of an aircraft occurs, Time in Modes based off site specific noise data will be developed in house at the Air Force Civil Engineering Center.

Auxiliary Power Unit

The APU tab is pictured in Figure 5.13. The APU tab is preloaded with applicable equipment based on the aircraft selected. The user only needs to click the “Check” button and proceed to the next tab.

AC Aircraft Activity

-1- General Information **COMPLETE** -2- Activity Type **COMPLETE** -3- Aircraft & Engine **COMPLETE** -4- Flight Operation(s) **INCOMPLETE**
-5- APU **INCOMPLETE** -6- Engine Test Cell(s) **INCOMPLETE** -7- AGE **INCOMPLETE** -8- Activity Location **INCOMPLETE**

Auxiliary Power Unit (APU)

Use Flight Operation(s) Defaults? **YES** **NO**
YES is selected

NOTE: ACAM will assume that all aircraft for this activity are using the APU(s) selected below.

Number of APU per Aircraft	Operation Hours For Each LTO	Exempt Source?	Designation	Manufacturer
0	0	No	131-3A	
0	0	No	131-9	
0	0	No	331 250G	
0	0	No	331-49-7081	
0	0	No	3800100-4	
0	0	No	ASHG70-1	
0	0	No	GTC 85-72	Honeywell Inc.
0	0	No	GTCP 100-544	Honeywell Inc.
0	0	No	GTCP 165-1	Honeywell Inc.
0	0	No	GTCP 165-9	
0	0	No	GTCP 30-300	Honeywell Inc.
0	0	No	GTCP 331-200	
0	0	No		

Check **OK** **Cancel**

Figure 5.13 – APU Tab

Engine Test Cell(s)

Similar to APU, the engine test cell tab (Figure 5.14) is preloaded with the applicable equipment and defaults based off previously inputted information. The user only needs to select “Check” and proceed.

AC Aircraft Activity

-1- General Information COMPLETE	-2- Activity Type COMPLETE	-3- Aircraft & Engine COMPLETE	-4- Flight Operation(s) INCOMPLETE
-5- APU COMPLETE	-6- Engine Test Cell(s) INCOMPLETE	-7- AGE INCOMPLETE	-8- Activity Location INCOMPLETE

Engine Test Cell

Use Flight Operation(s) Default Settings? Yes

Total Number of Aircraft Engines Tested Annually:

Engine Test Cell Default Settings

Use Default Settings? YES NO
YES is selected

Annual Run-ups / Test Durations

Annual Run-ups (Per Aircraft Engine):

POWER SETTING TEST DURATION

Idle (mins):	<input type="text" value="12"/>	Approach (mins):	<input type="text" value="27"/>
Intermediate (mins):	<input type="text" value="9"/>	Military (mins):	<input type="text" value="12"/>
AfterBurn (mins):	<input type="text" value="0"/>		

Check **OK** **Cancel**

Figure 5.14 – Engine Test Cell(s) Tab

Aerospace Ground Equipment

Similar to APU and Engine Test Cell, Aerospace Ground Equipment tab (Figure 5.15) is preloaded with all the applicable equipment based on the aircraft selected. The user only needs to select “check” to complete this tab.

Aircraft Activity

-1- General Information **COMPLETE** -2- Activity Type **COMPLETE** -3- Aircraft & Engine **COMPLETE** -4- Flight Operation(s) **COMPLETE**
-5- APU **COMPLETE** -6- Engine Test Cell(s) **COMPLETE** -7- AGE **INCOMPLETE** -8- Activity Location **INCOMPLETE**

Aerospace Ground Equipment (AGE)

Use Flight Operation(s) Defaults? **YES** **NO** (YES is selected)

Number of Annual LTO (Landing and Take-off) cycles for AGE: 1

Total Number of AGE	Operation Hours For Each LTO	Exempt Source?	AGE Type	Designation
0	0	No	Air Compressor	A/M32C-18
1	2	No	Air Compressor	MC-11
0	0	No	Air Compressor	MC-1A - 18.4hp
0	0	No	Air Compressor	MC-1A - 20hp
0	0	No	Air Compressor	MC-2A
0	0	No	Air Compressor	MC-5 - 100hp
0	0	No	Air Compressor	MC-5 - 110hp
0	0	No	Air Compressor	MC-5 - 130hp
0	0	No	Air Compressor	MC-7 - 48hp
0	0	No	Air Compressor	MC-7 - 52hp
0	0	No	Air Compressor	MC-8
0	0	No	Air Compressor	MODP160WJDACJF

Check **OK** **Cancel**

Figure 5.15 AGE Equipment Tab