

SEPG Document 35 Rev B : Software Project Management Plan / Log

Software Project Title: Computational Fluids Lab – 3D (CFL3D)

File Name and Version: CFL3D Version 6.0 on the CMSB cloud in ~biedron/Cfl3dv6 Software Class: low

Supervisor or Branch Head: James L. Thomas Software Manager: Robert T. Biedron

Schedule Start Date: Started before Jan. 1, 1999 Schedule End Date: N/A

Requirements:

Calculate the solution to the Euler and/or Thin-Layer Navier Stokes equations on multi-block structured grids. Calculations may be either time accurate, or accelerated to a steady state by sacrificing time accuracy. The scheme shall use a finite-volume approach with upwinding of the numerical fluxes using either Roe's scheme or van Leer's scheme, although the algorithm may be changed as developments warrant.

Requester Approval of Requirements Record:

The developer is a customer, so the requirements are approved.

Examples of constraints on the software development are completion date and programming language. An example of constraints on the software produced is the platform it will run on.

Life Cycle and Approach Record:

Modifications will not require a change in the software design

Several software life cycle options and development approaches are explained in Appendix I. The software manager adopts the software life cycle and approach most appropriate to their project. E.g., if the software project is too complex to allow a direct transition from user requirements to code, then a design phase is added to the minimum software life cycle.

Deliverables Record:

Source Code: ~biedron/Cfl3dv6/source is the top-level directory for the CFL3D Version 6 package. The package also includes various support codes for pre- and post-processing. Specifically the CFL3D source code is contained in two directories, ~biedron/Cfl3dv6/source/cfl3d/dist and ~biedron/Cfl3dv6/source/cfl3d/libs.

Documentation: In html format on the CMSB cloud in ~biedron/public_html/Cfl3dv6/cfl3dv6.html and visible on the web at:

<http://fmad-www.larc.nasa.gov:80/~biedron/Cfl3dv6/cfl3dv6.html>

Test Cases: In ~biedron/public_html/Cfl3dv6/2Dtestcases and ~biedron/public_html/Cfl3dv6/3Dtestcases, and visible on the web at:

http://fmad-www.larc.nasa.gov:80/~biedron/Cfl3dv6/cfl3dv6_testcases.html . Multiple complete sets of input and output for benchmark tests of the code are available. The html files guide the user through the testing process.

Backup of Source: on dmss @biedron/CFL3DV6_ARCHIVES/cfl3dv6.ascii.DATE where DATE is of the form 2Aug2000 for August 2, 2000. The backup source contains all of the pre- and post-processing source codes as well.

Backup of Test: on dmss @biedron/CFL3DV6_ARCHIVES/2DTestcases and @biedron/CFL3DV6_ARCHIVES/3DTestcases

Backup of Documentation: on dmss @biedron/CFL3DV6_ARCHIVES/Web_Documentation

Examples of deliverables include design description, source code, component/unit tests, and the test results, lists of tools used to create the source code and executable program, and libraries and software upon which the executing software depends.

Trade Study and Purchases Record:

No comparable commercial code is available

Describe the rational for the make or buy decision.

Type of Review, Verification, and Validation Activity(ies):

The code shall be reviewed whenever significant modifications are made to the code. The test suite should be run to determine the effects of the changes. New tests may be added as necessary.

Schedule for Reviews, Verification, and Validation:

As deemed necessary by the developer

Verification ensures that the product of each life cycle phase satisfies the conditions imposed at the start of the phase. (E.g., the requirements are reviewed to ensure that each requirement is feasible, unambiguous, and verifiable; the code is reviewed to ensure that all user requirements are fully addressed.) Validation involves ensuring that the product meets requirements. Validation activities include qualification testing to ensure that the user and software requirements have been satisfied (See Figure E.1). Review, verification, and validation can be treated as separate activities or integrated and performed as one activity.

Development Schedule and Personnel Record:

The developer has complete autonomy to further develop the code when and if future research provides better algorithms.

Requester Acceptance Criteria Record:

The code has been accepted by the customer (who is the developer) because it meets the requirements listed in **Requirements** near the beginning of this SPMP.

Risk Identification, Mitigation, and Avoidance Record(s):

Risk rating Form 50 was submitted to SEPG committee and showed negligible risk to LaRC

Installation Plan:

Installation support consists of a set of scripts: 1) packitup – decode, untar and set up directory structure for installation on the target platform and 2) Install – determine system architecture (IRIX, Sun, Cray, etc) and create an appropriate makefile.

Installation Schedule Record:

N/A

Maintenance Plan:

There is no scheduled maintenance plan, but user- and developer-reported bugs will be fixed and accumulated, with periodic releases of corrected code as deemed fit by the developer. In between periodic releases, bug fixes will be posted on the documentation site in html format on the CMSB cloud in the file:

~biedron/public_html/Cfl3dv6/cfl3dv6_updates.html

and visible on the web at:

http://fmad-www.larc.nasa.gov:80/~biedron/Cfl3dv6/cfl3dv6_updates.html

Configuration Management Plan:

Each periodic release shall occur in the form of an encrypted, tarred file, which shall reside in the CMSB cloud in ~biedron/Cfl3dv6, with the file name cfl3dv6.ascii.DATE, where DATE is of the form 2Aug2000 for August 2, 2000. The DATE extension shall distinguish one release from the other. The code executable shall have as part of its output data the release date, so that the version being executed is identified. All files on the CMSB cloud are backed up on a daily basis by the CMSB system administrator. In addition, each periodic release is to be archived on dmss as described under **Deliverables**.

This SPMP / Log must be updated as the software development evolves for all the above planned activities. Slippage in the scheduled end-date and changes in other applicable project variables must be reported to the supervisor or branch head to enable the LaRC Form 193 *Development Schedule for Low, High, and Critical Class Software* to be updated.

List of products placed under configuration management:

Software Project Management Plan /Log

Verification and/or validation test procedure(s)

Verification and/or validation test results

The name of the files containing the final version of the software, deliverables, and corresponding test inputs and outputs, including references to and version numbers of all items used in the tests

Review results and reviewers

Record of the software that is being delivered

Installation records

Maintenance records

Requester acceptance record

Others products identified by the software manager:

Configuration Management Records:

Retention period for all items under configuration control:

No Less than 5 years from 1/1/1999

Final location of the items under configuration control:

On the CMSB cloud in ~biedron/Cfl3dv6 and on dmss @biedron/CFL3DV6_ARCHIVES

Activity Log:

In html format on the CMSB cloud in ~biedron/public_html/Cfl3dv6/cfl3dv6_updates.html

