ConnectFlow Quality Plan

Prepared for

Prepared by Serco

Your Reference

Our Reference SA/ENV/CONNECTFLOW/1

Classification

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Title	ConnectFlow Quality Plan
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	In the areas where this work was performed, Serco is certified to BS EN ISO 9001:(2000) standard and the TickIT guidelines.

Modification History

Version	Date	Author	Reviewer	Approver	Description
1.0.0	12/10/2005	Steven Joyce	Ben Swift	David Lever	Initial version.
1.0.1	15/11/2006	Steven Joyce		David Holton	Change of ENV contribution centre manager.
1.1.0	12/10/2007	Steven Joyce		David Holton	Changed SVN repository and updated version numbers in references.
1.2.0	30/11/2011	Steven Joyce	Lee Hartley	Lee Hartley	Updated file server and references.

Preface

ConnectFlow is the suite of Serco's groundwater modelling software that includes the NAMMU continuum porous medium (CPM) module and the NAPSAC discrete fracture network (DFN) module. ConnectFlow is also the name given to the concept of nesting NAMMU and NAPSAC sub-models into a combined CPM/DFN model. Hence, ConnectFlow is a very flexible tool for modelling groundwater flow and transport in both fractured and porous media on a variety of scales.

This document is the quality plan for the development of the ConnectFlow software suite.

Contents

1 Introduction

This document is the quality plan for the development of the ConnectFlow software, as required by Serco procedure DSNE-LOP-BL16.

1.1 Scope

This document applies to all development of the software in the ConnectFlow suite, including NAMMU and NAPSAC.

1.2 Conventions

Text in a `courier` font indicates file paths or computer names.
Text in *`UPPER-CASE, ITALIC, COURIER`* font indicates words in file paths or computer names that should be substituted by the user.
`SVNHOME` indicates the Subversion work area for the `connectflow` files under version control.

1.3 QA Objectives

This QA system seeks to continually improve the quality and reliability of the software. To achieve this, ConnectFlow shall be developed according to the Serco software development procedures to meet the BS EN ISO 9001:(2000) standard and the TickIT guidelines.

1.4 Audits

The ConnectFlow QA system will be audited as part of the routine internal and external TickIT audits.

1.5 Software Categorisation (BRL)

The Business Risk Level (BRL) for ConnectFlow development is 3.
This is because it is supplied to external customers and also used internally to produce results that are supplied to external customers.
There are no special safety, environmental or financial considerations.

2 Project Structure

2.1 Lines of Communication

All instructions to carry out developments on the ConnectFlow software and associated material shall be given via a Software Observation Report (see Change Control) by the ConnectFlow Software Manager. These instructions may be expanded on verbally or by email. Any additional information shall be recorded in the Software Observation Report by the Software Manager or assigned developer.

2.2 Tasks and Responsibilities

The ConnectFlow Software Manager is responsible for assigning and monitoring tasks using the Software Observation Report system (see Change Control).

2.3 Configuration Management

Version control of all configuration items is managed using the Subversion (SVN) software (http://subversion.apache.org/).

The SVN repository for ConnectFlow is located on the file server at `/project/subversion/repository/`. The ConnectFlow files are in the `connectflow` project.
The following items are under configuration control:

- Source code.
- Image files.
- Java archives (jar files).
- Test data.
- User documentation.
- Developer documentation (including this document).
- Developer scripts and utilities.
- Third party software libraries.

The ConnectFlow Software Manager is responsible for the configuration management system. SVN comments shall be used to identify file version changes that are associated with a Software Observation (see Change Control), as described in the ConnectFlow Software Maintenance Guide.

2.4 Change Control

Change control is managed using the on-line Software Observation Report forms located at http://fermat.harwell.serco.com/qa/software/swf/4.html.

2.5 Design Reviews

A review of any designs shall be carried out by either the ConnectFlow Software Manager. The author shall not review his/her own design. Changes resulting from the review shall be incorporated into the design.

2.6 Tests

Testing is described in the ConnectFlow Software Testing Guide.

2.7 User documentation

The following user documentation is maintained for ConnectFlow:

- Release notes/README file.
- Installation and running guides.
- Technical summaries.
- Verification documents.
- User guide (on-line for the graphical user interface).
- Command reference manual (on-line).
- Tutorials (on-line).

2.8 Resources

Resources shall be assigned to ConnectFlow software development by the ConnectFlow Software Manager according to the availability and competence of staff. Funding for developments shall be provided either from projects or from the ConnectFlow maintenance

budget as appropriate. The ConnectFlow maintenance budget is funded by software sales and subscriptions to the iConnect club.

3 Quality assurance

3.1 Releasing

3.1.1 Software Release Form

The on-line Software Release form shall be used for each external release of the software. This is located at http://fermat.harwell.serco.com/qa/software/swf/1.html. Using this form submits the release request to the release authority for approval. Once the release has been approved, the software can be released.

3.1.2 Software Release Authority

The software release authority for ConnectFlow is a manager with contract signing authorisation.

3.2 Document Control

Changes to documentation are managed by the Configuration Management system.

3.3 Documentation Standards, Release and Approval

Documents shall be produced that are clear and accurate. Significant project and user documentation changes shall be reviewed by a reviewer assigned by the ConnectFlow Software Manager. Project documentation changes shall be approved by the ConnectFlow Software Manager. User documentation changes shall be approved as part of the software release process (see Releasing).

3.4 Test Strategies

Testing is described in the ConnectFlow Software Testing Guide.
The testing strategy is to regression test the software prior to each release.
New tests are added as required by new features along with reference output.
Key functionality shall be verified by one or more verification test cases.

3.5 Standards, Practices and Conventions

The coding standards that shall be followed when carrying out software developments are contained in the ConnectFlow General Coding Standard, the ConnectFlow Fortran Coding Standard and the ConnectFlow Java Coding Standard.

3.6 Software Tools

The software tools used for ConnectFlow development are described in the ConnectFlow Software Maintenance Guide.

3.7 Media Control

The ConnectFlow software shall be issued to external users on CD, DVD or by web download. This is described in the ConnectFlow Software Maintenance Guide.

3.8 Problem Reporting and Corrective Action

Problems reported by users are managed using the Software Observation Report system (see Change Control).

3.9 Technical Reviews

Technical reviews shall be recorded using the on-line Software Review forms located at http://fermat.harwell.serco.com/qa/software/swf/5.html. They shall take place when requested by the ConnectFlow Software Manager, but at least annually.

3.10 Progress Meetings

Progress meetings are held as required to discuss maintenance developments or developments related to projects.

3.11 Maintenance

ConnectFlow is currently in a maintenance phase. Maintenance is described in the ConnectFlow Software Maintenance Guide.

3.12 Backups and Archiving

The files for ConnectFlow are kept on a file server. This is backed up daily. The server has an archiving facility for moving old files to tape if required.

3.13 Continual Improvement

Continual improvement of ConnectFlow is managed using the Software Observation Report system (see Change Control).

4 Lifecycle

4.1 Lifecycle Description

ConnectFlow is in a maintenance phase and so developments will either be bug fixes or individual additions to the functionality. The developments use an incremental Waterfall lifecycle, controlled using the Software Observation Report system (see Change Control). The phases available using these forms are:

- Specification - the initial submission of the form.
- Analysis – examine the issues or feasibility of implementing the change, or develop a design.
- Implement – implement the change.
- Test – test the software after the change.
- Obsolete – reject the requested change.
- Close – close the observation following implementation.

Some of these phases may not be required. For example, testing may be carried out during the implementation phase or may not be applicable (e.g. in a documentation update). The on-line forms document the actions carried out in each phase. The ConnectFlow Software Manager controls the flow between phases and is able to review the output of each phase and add any notes to the form.

4.2 Methodology

The design methodology used for new developments shall be object-oriented, where appropriate and supported by the development language, using UML notation and diagrams. Developments on existing Fortran code shall be structured.

4.3 Development

Instructions on how to carry out the development tasks for ConnectFlow maintenance are described in the ConnectFlow Software Maintenance Guide.

4.4 Testing

Testing is described in the ConnectFlow Software Testing Guide.

5 References

1. ConnectFlow Software Maintenance Guide, SA/ENV/CONNECTFLOW/3 (*SVNHOME*/connectflow/doc/developer/conflow_maintenance.doc).
2. ConnectFlow Software Testing Guide, SA/ENV/CONNECTFLOW/2 (*SVNHOME*/connectflow/doc/developer/conflow_testing.doc).
3. ConnectFlow General Coding Standard, SA/ENV/CONNECTFLOW/4 (*SVNHOME*/connectflow/doc/developer/conflow_general_coding.doc).
4. ConnectFlow Fortran Coding Standard, SA/ENV/CONNECTFLOW/5 (*SVNHOME*/connectflow/doc/developer/conflow_fortran_coding.doc).
5. ConnectFlow Java Coding Standard, SA/ENV/CONNECTFLOW/6 (*SVNHOME*/connectflow/doc/developer/conflow_java_coding.doc)