

SPIRE ICC

FSC requirements on SPIRE User Requirements Document

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1 Introduction

1.1 Purpose & Scope

This document describes the requirements put on the SPIRE ICC by the FIRST Science Centre (FSC) such that the FSC is able to perform observations with the instrument and allow the Proposer to receive and, possibly, process the scientific data. This includes interfaces for the provision by the ICC of calibration files, AOTs and data processing software. The requirements also include the need for SPIRE to be able to work with/in environments provided by the FSC, for example the FCSS and FINDAS.

1.2 Definitions of Terms and Acronyms

Listing of acronyms that are of specific relevance to this URD

CUS	Common Uplink System
FINDAS	FIRST Integrated Network Data Archiving System
FCSS	FIRST Common Science System
FSC	First Science Centre
IA	Interactive Analysis
QCP	Quality Control Pipeline

In addition two web pages are available describing terms applicable to SPIRE

<http://www.ssd.rl.ac.uk/spire/consortium/information/FIRSTacronyms.shtm>

<http://www.ssd.rl.ac.uk/spire/consortium/information/FIRSTdefinitions.asp>

1.3 Related Documents

1.3.1 Applicable Documents

AD-1	FIRST Ground Segment Design Description	FIRST/FSC/DOC/0146
AD-2	FSC System Actor Definitions	FIRST/FSC/DOC/0157

1.3.2 Reference Documents

RD-1	SPIRE ICC URD Scope Document	SPIRE-ICS-DOC-000484
RD-2	FIRST Operations Scenario Document	Draft 0.95 22 February 2000
RD-3	FSC System Use Case Definitions	FIRST/FSC/DOC/0158
RD-4	FSC System URD	FIRST/FSC/DOC/0115
RD-5	FINDAS URD	FIRST/FSC/DOC/?????
RD-6	FSC IRD	FIRST/FSC/DOC/0117
RD-7	Technical Note on the Coding Standards for the FCSS development	FCSDT/TN-009

1.4 Overview

The FSC is the single-point interface to the outside community, handling proposals and support. It coordinates cross-calibration between ICCs, uplink of schedules to the MOC and provides quality control and scientific product production. It manages the FIRST Common Science System (FCSS) comprising of sub-systems such as the Common Uplink System (CUS) and the Quality Control Pipeline (QCP). At the core of the FCSS is FINDAS, used to store, distribute and retrieve all mission artifacts relevant to science and instrument operations.

The ICC is responsible for the operation, monitoring and calibration of the SPIRE instrument. To this end the FSC requires from the ICC calibration and engineering observations, observation quality data, instrument onboard software, scientific product production software, instrument procedures and commands and updates to the instrument database, e.g. calibration files. It also requires the ICC to provide instrument and software documentation and support for queries on the instrument behaviour/functionality that may come from the FSC (e.g. arising from QCP), the MOC or the external community.

2 User Characteristics

The descriptions of the users can be found in the document FSC System Actor Definitions.

1.5 FSC-side Specific

Archive User
Astronomer
Configuration Control Board
Configuration Controller
FIRST Observation Time Allocation Committee (FOTAC)
General Public
Helpdesk
Mission Planner
Mission Operations Centre (MOC)
Problem Analyst
Project Science Team (PST)

1.6 ICC Specific

Calibration Scientist
ICC Manager
Instrument Engineer
Instrument Tester
Scientific Software Developer
Scientific Product Analyst

1.7 Either

Software Tester
SW Maintenance Team

2 Requirements

This section describes the actual requirements made on the ICC by the FSC. Note that the Phase flag indicated the *earliest* phase the requirement is made at. It is assumed, unless explicitly stated that the requirement holds for all subsequent phases.

2.1 Common Uplink System / Mission Planning

2.1.1

Repetitive calibration/engineering observations must be submitted as a series of observations (as opposed to submitting a type of observation once and requesting it be re-executed after some specified intervals).

Source	RD-2[5.2.1]
Importance	Essential
Frequency	Weekly
Phase	ILT

2.1.2

Calibration or engineering observations will normally be submitted at fixed times (interval TBD) within the agreed nominal scheduling cycle (duration TBC). For non-nominal instrument behaviour the timescale for submission and planning of an observation will be at least 3 days (TBC).

Source	RD-2[5.2.1]
Importance	Essential
Frequency	Daily/Weekly
Phase	Operations

2.1.3

FSC schedule to MOC may mix calibration and engineering observations with science observations. i.e. requirement on ICC not to assume a complete OD is available for calibration or engineering observations (unless there is some instrument problem and science observations cannot be performed anyway).

SPIRE must place a UR on FSC to allow it to specify what we want to do in terms of how we submit calibration observations. E.g. we must be able to observe at certain times.

Source	RD-2[5.2.1]
Importance	Desirable
Frequency	Infrequent

Phase Operations

2.1.4

Failed calibration or engineering observations must be specifically re-requested by the ICC. The FSC will only reschedule failed science observations.

Source	RD-2[5.2]
Importance	Essential
Frequency	Daily
Phase	ILT

2.1.5

A scheduled observation must be unscheduled before it can be modified. I.e. it may not get the same slot on resubmission.

Source	RD-2[5.3.1.2]
Importance	Essential
Frequency	Weekly
Phase	ILT

2.1.6

Mission Planning can reject a calibration or engineering observation from a particular OD if it results in a poor Figure of Merit for the schedule.

This is a possibility, to be confirmed or otherwise by FSC, that requires the implications to be addressed.

Source	Here
Importance	Desirable
Frequency	Weekly
Phase	Operations

2.1.7

A schedule containing calibration or engineering observations can, on the approval of the Project Scientist, be replaced with one that does not contain the observations, for example in the case of a ToO.

This is a possibility, to be confirmed or otherwise by FSC, that requires the implications to be addressed.

Source	Here
Importance	Desirable
Frequency	Monthly/Yearly
Phase	Operations

2.2 IA/QCP

2.2.1

Any software provided to the FSC for FSC use or use by the community will be written in Java.

For scripting purposes (within IA for example) the JPython scripting language is currently under investigation. It integrates seamlessly with Java .

Source	Use-Case meeting #5
Importance	Essential
Frequency	Monthly
Phase	ILT

2.2.2

Any software provided to the FSC for FSC use or use by the community will follow the coding standards for the FCSS.

Source	RD-7
Importance	Essential
Frequency	Monthly
Phase	ILT

2.2.3

Provide IA/QCP tools for the FSC to carry out parallel/cooperative assessment (with the ICC instrument specialists) of the status and behaviour of the instrument.

Source	RD-2[5.2.2]
Importance	Essential
Frequency	Monthly
Phase	PV

2.2.4

Provide IA tools for interactive analysis of data by the Astronomer using the FSC environment, and IA tools that can be installed at the Astronomer's institute subject to (TBD) supported platforms.

These IA tools will most likely be identical to those provided in the previous requirement. The tools for both remote (i.e. at the FSC) and local installation use will be the same, i.e. SPIRE will only support platforms available at the FSC. The requirement that IA tools can be installed locally has implications for remote access of observations from FINDAS and possible off-line use.

Source	RD-3[UCF-493]
Importance	Essential
Frequency	Monthly
Phase	Operations

2.2.5

The QCP tools provided to the FSC will allow the systematic and automatic generation of quality control data for each science observation

Source	RD-3[UCF-331]
Importance	Essential
Frequency	Monthly
Phase	Operations

2.2.6

As a result of routine QCP carried out by the FSC, the ICC will undertake joint review with the FSC to establish new 'nominal' values for instrument/observation parameters if it is thought that current parameters do not produce optimal products.

Source	RD-2[5.2.2]
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Importance	Essential
Frequency	Monthly
Phase	IST

2.2.7

The ICC will provide periodic calibration status reports.

Source	RD-2[5.2.2]
Importance	Desirable
Frequency	Weekly/Monthly
Phase	ILT

2.2.8

The ICC will provide the long-term calibration plan and strategy, updated as necessary by ongoing calibrations. The FSC informs the community of the calibration status and strategy at regular intervals.

Source	RD-2[5.2.2]
Importance	Desirable
Frequency	Monthly/Yearly
Phase	ILT

2.3 FINDAS

2.3.1

The ICC must provide support for the running and maintenance of the local FINDAS node at the ICC.

There needs to be an Actor at the ICC with sufficient knowledge of how the local node runs to be able to fix it if it stops, or know who to contact if the problem is serious.

Source	Here
Importance	Essential
Frequency	Daily
Phase	ILT

2.4 FCSS Maintenance / Configuration Control System

2.4.1

On the raising of an appropriate SPR/SCR the ICC will update code to generate an onboard software memory image and deliver it to the FSC with a software release note describing its implications and updated documentation. This will be more frequent during IST/PV phases.

The OBS URD needs to indicate who is responsible for maintaining code, since IFSI is not around in the operations phase.

Source	RD-2[5.11.1]
Importance	Essential
Frequency	Monthly/Yearly
Phase	IST

2.4.2

The ICC shall use the Configuration Control System of the FCSS for all software and documentation of the common system that is jointly supported and maintained by the FSC and ICCs.

CVS (Concurrent Versions System) is currently the implementation of a Configuration Control System

Source	RD-2[5.11.2]
Importance	Essential
Frequency	Daily
Phase	ILT

2.4.3

ICC submit, under configuration control, updates of calibration/engineering files and AOTS to the FCSS such that the best, verified parameters, procedures, etc are used to perform and reduce observations. More frequent during ILT/IST.

Source	RD-2[5.2]
Importance	Essential
Frequency	Monthly
Phase	ILT

2.4.4

Changes to any system artifact upon which the FSC has a dependency must be preceded by the submission of a SCR.

Source	RD-3[UCF-421]
Importance	Essential
Frequency	Daily
Phase	ILT

2.4.5

Following submission of a SCR the relevant artifacts must be checked out of the FCSS and a test plan and test environment created. Updated artifacts must be verified with the CC and CCB prior to checking into the FCSS.

Source	RD-3[UCF-395]
Importance	Essential
Frequency	Daily
Phase	ILT

2.4.6

Persistent processing results have to be reproducible, implying traceability of the configuration and input products used to produce new or updated artifacts.

Source	Here
Importance	Essential
Frequency	Daily
Phase	ILT

2.4.7

The ICC will produce updates to software it delivers to the FSC, for integration into the FCSS.

To update software we only need submit new versions to the configuration control system. The FSC rebuild the development release of the FCSS each night. The FSC makes development releases `live` on a six weekly cycle.

Source	FSC
Importance	Desirable
Frequency	6 weekly
Phase	ILT

2.5 Community Support

2.5.1

ICC interfaces directly with the FSC Helpdesk (community support) for questions and answers.

During office hours

Source	RD-2[5.1.4] RD-3[UCF-605]
Importance	Desirable
Frequency	Daily
Phase	Call for proposals #1

2.5.2

ICC provides information, material and staff appearances requested by the FSC for PR purposes.

Source	Here RD-3[UCF-92]
Importance	Desirable
Frequency	Daily/Weekly
Phase	Operations