

## URD Scope Descriptions

This document lists the scope descriptions of User Requirement Documents (URDs) needed for input to SPIRE ICC Use-Cases. The Use-Cases and URDs form the basis of the SPIRE Science Implementation Plan (SIP).

The list headings were made at the SPIRE ICC Definition Team meeting at ICSTM on 9th June 2000 (SPIRE-ICS-MOM-000437). The person(s) responsible for delivering the URDs to the Use-Case writers\* (and in some cases collating / requesting the user requirements from members of the SPIRE Consortium) is given with each URD scope description.

\*Currently: Trevor Dimbylow (RAL), Sunil Sidher (RAL), Neal Todd (ICSTM).

### **1) AIV Requirements (ILT, IST, etc)** (Ken King; Bruce Swinyard, RAL)

SPIRE-ICS-PRJ-000543

Requirements put on the ICC by the need to be able to test and calibrate the instrument deliverable models, both at RAL and at ESA centres. The Electrical Ground Support Equipment (EGSE) used for these tests requires the availability of some of the ICC systems to support data processing, display and storage. Instrument Engineers, Calibration Scientists and Test Controllers will make use of this system.

This URD exists as a draft from the EGSE working group (SPIRE rep: Ken King)

### **2) Calibration Requirements** (Seb Oliver, Sussex)

SPIRE-ICS-PRJ-000544

Requirements put on the ICC by the need to calibrate all the astronomical data taken by the instrument. This includes making calibration observations, producing calibration products and preparatory calibration observations (at other telescopes). It also includes calibration of the instrument itself, both ground-based (ILT and IST) and in-flight.

### **3) Photometer processing** (Walter Gear, Cardiff. Seb Oliver, Sussex)

SPIRE-ICS-PRJ-000545

Requirements put on the ICC by the Photometer observing modes. It will describe the form the data is expected to take and the information required to fully characterise it. It also puts requirements on the ICC by the need to produce a data reduction process for the photometer observation modes of SPIRE. These observation modes might have either a purely scientific goal or an engineering purpose. The potential users of the data reduction process might be either members of the SPIRE Consortium, or astronomers having access to the FIRST observations (via the FSC).

### **4) FTS Processing** (Jean-Paul Baluteau, LAM)

SPIRE-ICS-PRJ-000546

Requirements put on the ICC by the Spectrometer observing modes. It will describe the form the data is expected to take and the information required to fully characterise it. It also puts requirements on the ICC by the need to produce a data reduction process for the spectroscopic observation modes of SPIRE. These observation modes might have either a purely scientific goal or an engineering purpose. The potential users of the data reduction process might be either members of the SPIRE Consortium, or astronomers having access to the FIRST observations (via the FSC).

### **5) Routine Instrument Operation** (Gillian Wright, ATC)

SPIRE-ICS-PRJ-000547

Requirements put on the ICC by normal instrument operation, including monitoring the performance of the instrument and changing observing plans. People involved will include; ICC scientists, consortium scientists, FINDAS scientists, astronomers interacting with the ICC via the FSC.

NB: This URD is a textual description of normal operations, linking together more specific URDs.

### **6) Instrument Engineering** (Gillian Wright, ATC)

SPIRE-ICS-PRJ-000548

Requirements put on the ICC by the need to perform non-routine work on the instrument - for example the need to be able to execute test sequences, analyse the data from the tests, and perhaps modify astronomical observing modes in the light of the tests (e.g., changing parameters of an AOT) or modify how modes are implemented (e.g., changing an AOT). The people involved in instrument engineering may be ICC scientists, calibration scientists, engineers, or Consortium scientists.

### **7) ICC as a whole system** (Neal Todd, ICSTM)

SPIRE-ICS-PRJ-000549

Requirements on the infrastructure needs of the ICC to allow it to function day-to-day, during the different phases of the mission. This includes procedural functions and high-level requirements common to the other URD scopes, for example: the provision of a suitable database; communication channels within SPIRE and with the FSC, MOC and other ICCs.

URDs and Use-Cases relating to this are currently being written by the FIRST Use-Case team (SPIRE ICC reps: Trevor Dimbylow, Sunil Sidher, Neal Todd) and the OODBMS requirements team (SPIRE ICC rep: Sunil Sidher).

### **8) FSC** (Neal Todd, ICSTM)

SPIRE-ICS-PRJ-000550

Requirements put on the ICC by the FIRST Science Centre such that the FSC is able to perform observations with the instrument and allow the Proposer to receive and/or process their scientific data. This includes interfaces for the provision by the ICC of calibration files, AOTs and data processing software. It also includes the need for SPIRE to be able to work within environments provided by the FSC, for example, FINDAS.

URDs and Use-Cases relating to this are currently being written by the FIRST Use-case team (SPIRE reps: Trevor Dimbylow, Sunil Sidher, Neal Todd) and there is a FGS IRD (1.0) issued by the FGSSE (SPIRE rep: Sunil Sidher) and a FINDAS URD (SPIRE rep: Neal Todd).

### **9) Common Uplink System** (Sunil Sidher, RAL)

SPIRE-ICS-PRJ-000551

Requirements put on the three ICCs by the need to generate relative time tagged commands for all types of observations, viz. AOT's, calibration observations and engineering observations (i.e., a common uplink system). At an ICC the CUS will be used by the instrument experts, including calibration scientists and instrument engineers. The FSC will also be a user of the CUS for cross-calibration observations. Astronomers, however, will *not* be users of the CUS.

The CUS URD is currently being prepared by the CUS working group (SPIRE ICC rep: Tanya Lim).

### **10) Astronomical Observation Preparation** (Marc Sauvage, CEA)

SPIRE-ICS-PRJ-000552

Requirements for the need to be able to prepare astronomical observations using the instrument. Those preparing observations might be ICC calibration scientists or astronomers interacting with the ICC via the FSC.

### **11) Digital Processing Unit On-board Software** (Sunil Sidher, RAL)

SPIRE-ICS-PRJ-000553

Requirements put on the ICCs by the need to install, test, update and maintain the DPU OBS so that the instrument operates in a safe, effective and efficient manner. The OBS users will include instrument experts (instrument subsystem developers, calibration scientists and instrument engineers).

The OBS URD has been produced by IFSI in Frascati (SPIRE ICC reps: Ken King, Sunil Sidher). [To be reviewed at the June 2000 PDR]

### **12) SPIRE Consortium** (Seb Oliver, Sussex)

SPIRE-ICS-PRJ-000554

Requirements placed on the ICC by the SPIRE Consortium as a special user. A mechanism must exist that allows a strong interaction between the SPIRE Consortium and the ICC.

### **13) MOC** (Trevor Dimbylow, RAL)

SPIRE-ICS-PRJ-000555

Requirements put on the SPIRE ICC by its direct interfaces with MOC, for example queries to the ICC about the instrument. Requirements in this area will also arise because of the need to mimic the MOC - to some TBS level - during ILT.

Interface requirements relating to this are in the FGS IRD (1.0) issued by the FGSSE (SPIRE rep: Sunil Sidher).

**14) Other ICCs (PACs and HIFI) (Marc Sauvage, CEA)**

SPIRE-ICS-PRJ-000556

Requirements stemming from the need (1) to cross-check calibration measurements obtained by other FIRST instruments, (2) to transfer information SPIRE may obtain on instrument and telescope status, and (3) to coordinate observations of a given source with multiple FIRST instruments. There are also requirements stemming from areas of commonality, e.g. IA.

**15) Public (Seb Oliver, Sussex)**

SPIRE-ICS-PRJ-000557

Requirements put on the ICC by the need to interact with the general public. This might included the provision of WWW pages or other publicity material. Most of this interaction will be via the FSC, in the first instance at least (i.e., the public has no direct first contact with the ICC).