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Project : **SLSTR-SST-FRM-Validation**

Title : Copernicus SLSTR SST Validation using FRM: Project Plan

Abstract : This document contains the Project Plan for the Copernicus Sentinel-3 Sea and Land Surface Temperature Radiometer (SLSTR) Sea Surface Temperature (SST) Validation using Fiducial Reference Measurements (FRM) Service (SLSTR-SST-FRM-Validation).

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EUROPEAN SPACE AGENCY
CONTRACT REPORT

The work described in this report was done under ESA contract. Responsibility for the contents resides in the author or organisation that prepared it.

AMENDMENT RECORD

This document shall be amended by releasing a new edition of the document in its entirety. The Amendment Record Sheet below records the history and issue status of this document.

AMENDMENT RECORD SHEET

ISSUE	DATE	REASON FOR CHANGE
A	30-11-17	Draft for internal review
B	29-03-18	Updated draft following contract negotiation with ESA
C	05-04-18	Draft for ESA review
1	14-05-18	First Issue

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1. INTRODUCTION

1.1 Purpose and Scope

This document is the Project Management Plan (PMP) for the ESA Copernicus Sentinel-3 Sea and Land Surface Temperature Radiometer (SLSTR) Sea Surface Temperature (SST) Validation using Fiducial Reference Measurements (FRM) Service (SLSTR-SST-FRM-Validation) concerned with validating SST using *in situ* measurements.

1.2 Structure of the Document

After this introduction, the document is divided into a number of major sections that are briefly described below:

2. PROJECT OVERVIEW

3. PROJECT ORGANISATION

   This section describes the consortium members, organisation, and team structure, and explains the team's interactions with the climate research community.

4. MANAGEMENT

   This section describes the following: lines of communication, project control, project reviews and meetings, progress reporting, action log, quality management, risk management, document review cycle, travel and meeting plan.

5. ANALYSIS OF RISK FACTORS AND MITIGATION STRATEGIES

   This section describes the risks identified when planning the project, and the strategies that can be adopted to mitigate them.

6. WORK PLAN

   This section includes the list of deliverable items, the Work Breakdown Structure, and the Work Plan (planning, schedule, milestones, deliverables).

7. QUALITY ASSURANCE

   This section includes configuration and document management.

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   SCHEDULE

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2. PROJECT OVERVIEW

This project, which is funded by the European Space Agency (ESA), starts on 1 April 2018, and is due to run for one year with an option for an extension for a further year. The aim of this project is **to validate Copernicus Sentinel-3A and Sentinel-3B2 SLSTR SST data products using Fiducial Reference Measurements (FRM)**. This aim will be fulfilled through the collection, processing, analysis, publication and reporting of *in situ* FRM field measurements made using ISAR and SISTeR instruments, that are near-contemporaneous with satellite data from the Sentinel-3A and Sentinel-3B SLSTR instruments.

The objectives for the SLSTR-SST-FRM-Validation project are:

- **OBJ-1:** Validate Sentinel-3A and Sentinel-3B SLSTR L1, L2 and higher order SST products to FRM standards.
- **OBJ-2:** Maintain and deploy on a continuous basis Thermal Infrared Radiometers (TIR) FRM and necessary supporting instrumentation to validate Sentinel-3 SLSTR SST products.
- **OBJ-3:** Process, archive and quality control all data following documented FRM procedures that approve their use for FRM satellite validation.
- **OBJ-4**: Deliver approved data sets and uncertainty budgets to Copernicus and the Sentinel-3 Mission Performance Centre.
- **OBJ-5**: Collaborate with appropriate International Scientists and Agencies using TIR for satellite validation as an International SST FRM Radiometer Network.
- **OBJ-6**: Prepare and submit peer-reviewed journal articles.
- **OBJ-7**: Conduct communications and outreach material promoting Copernicus Sentinel-3 SLSTR and the SLSTR-SST-FRM-Validation project.

Providing reliable and timely Fiducial Reference Measurements to support the validation of SLSTR SST involves the use of three unique European activities and data sets:

- Continuation of the English Channel and Bay of Biscay ISAR radiometer deployments, ISAR 002 and 003, involving:
  - ISAR instrument operation on the *Pont Aven* or equivalent ferry,
  - Quality assurance of ISAR data, including pre- and post-deployment laboratory validations,
  - ISAR instrument maintenance.
- Continuation of SISTeR A deployments on the *Queen Mary 2* liner between Southampton and New York, and round the world, involving:
  - Regular deployments of a single SISTeR radiometer on the *Queen Mary 2* liner to collect radiometric measurements of the sea surface,
  - Validating the radiometric calibrations of the SISTeR radiometers before and after every deployment, following best practice,
  - SISTeR instrument maintenance.

  Note: for continuous deployment, an additional instrument will need to be built, which is outside the remit of this project.

- Deployment on Smyril-line Denmark–Faroe Island-Iceland, ISAR 008, in synergy with the Ferrybox project and instrumentation, involving:
  - Regular deployments of the DMI ISAR radiometer on the *Norröna* passenger ferry or equivalent to collect radiometric measurements of the sea surface,
  - Validating the radiometric calibrations of the DMI radiometer against a blackbody reference before and after every deployment, following best practice.
  - ISAR instrument maintenance.

The SST FRM products will be:

- University of Southampton ISAR data in L2R format with calibrated skin SST and associated uncertainties.
- DMI ISAR data in L2R format containing traceable estimates of brightness temperature, SST and associated uncertainties.
- RAL SISTeR data in L2R format

The work to be carried out by the project team also involves:

- For all instruments: generate formatted products containing traceable estimates of brightness temperature, sea surface skin temperature and associated uncertainties from the radiometric measurements.
- To continue the time series of radiometer measurements started in 2004 by Defra, in order to ensure that sufficient skin SST reference measurements are acquired to reliably tie the SST record from the AATSR to the SST record from SLSTR, involving:
  - Regularly processing of the ISAR and SISTeR data to ISFRN L2R format and update the archive with calibrated skin SST containing traceable estimates of brightness temperature, sea surface skin temperature and associated uncertainties from the radiometric measurements,
  - Processing will be facilitated by French Research Institute for the Exploitation of the Sea (Ifremer), using the Felyx tool to process and generate validation reports,
  - Maintaining an archive of SST radiometer data in a common format (an International SST FRM Database).
- To support a collaborative network that enables other users of ship radiometers worldwide to contribute to the *in situ* SST Reference Database and which disseminates the data to the wider community. This includes maintenance of Fiducial Reference Measurement protocols.

In addition, the SST FRM project will provide and maintain an International SST FRM Radiometer Network (ISFRN) website that will make information and data available on all aspects of the radiometer deployments to users and the project team, as appropriate. This includes; a Campaign Implementation Plan (CIP), a Campaign Actions and Risk Log (CARL), the most recent radiometer data and calibrated skin SST with associated uncertainties, validation plots, reports and links to scientific papers, an ISFRN data description and user manual, and details of the ISFRN Service Review Meeting.

3. PROJECT ORGANISATION

3.1 Consortium Members

The project team members are:

- Space ConneXions Limited (SCL) – Project Management
- University of Southampton (UoS) – Contract Management
- University of Southampton (UoS) – ISAR Project Scientist, Technical Lead
- Danish Meteorological Institute (DMI) – ISAR Project Scientist
- STFC (RAL Space) – SISTeR Project Scientist

In addition, Ifremer will be making its archive facilities and Felyx tool available to the project, at no cost to ESA.

3.2 Prime Contractor

The University of Southampton (UoS) is the Prime Contractor.

3.3 Organisation Chart

Figure 3-1 shows the team's organisation structure and main lines of communication.

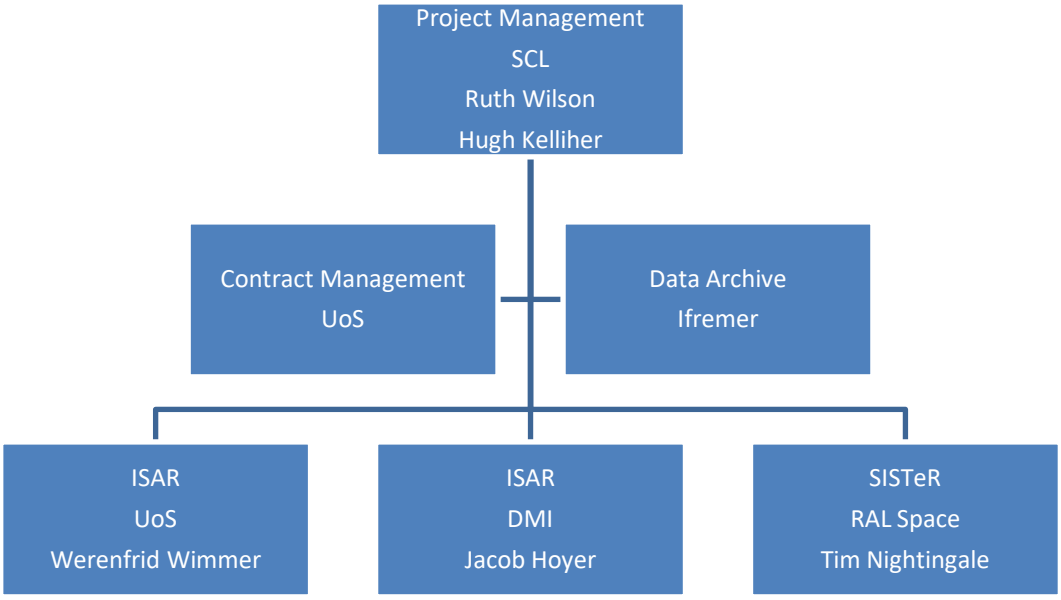

Figure 3-1 - Organisation of consortium, with key personnel

At the top level, the project activities will be co-ordinated by SCL with the University of Southampton handling the contract with ESA. UOS, RAL Space and DMI will each manage their own instruments, whilst Ifremer will store the data the instruments produce and make it available to external users.

Communications between team members will be facilitated by e-mail, Skype or telephone conference calls, and face to face discussions. In the unlikely event of disagreements occurring within the team, directors or senior staff from the organisations concerned will meet to resolve the issues.

3.4 Team Structure and Staffing

Table 3-1 lists the staff who are undertaking the work, and their roles.

Table 3-1 – Organisation Chart for the Project Team

Role	Organisation	Staff	Role
Prime Contractor	University of Southampton	Werenfrid Wimmer Doug Atkins	Technical Lead Contracts Officer
Project Management	Space ConneXions	Ruth Wilson Hugh Kelliher	Project Manager ISFRN website manager Deputy Project Manager
Project Scientists	University of Southampton	Werenfrid Wimmer Ray Holmes	ISAR Project Scientist ISAR Project Support
	DMI	Jacob Høyer	ISAR Project Scientist
	STFC (RAL Space)	Tim Nightingale	SISTeR Project Scientist

3.5 External Services

Ifremer (France) will provide hosting for the radiometer data produced by UoS, RAL Space and DMI, at no cost to the project. Ifremer are experienced in hosting oceanic data at sites such as Coriolis (http://www.coriolis.eu.org/) and providing a reliable service to users.

UoS, RAL Space and DMI will store their ISFRN L2R data files at the archive once they become available, which is normally after the post-deployment calibration. The members of the ISFRN will upload their L2R data and documentation to the Ifremer site via ftp. The ISFRN L2R files will be accompanied by calibration information, such as plots and calibration factors from the pre- and post-deployment calibrations. Documentation of the traceability of all calibration equipment will also be stored at the data archive, as well as the ISFRN web portal. Data will be downloaded via the Ifremer web portal using their existing interface.

The data archive will be accessible through the ISRFN web portal and will provide data to users on request through the web portal. Uploading data from non-project partner groups who collect data to ISFRN standard and submit the data in ISFRN L2R format will be facilitated through the ISRFN web portal. Initially, the archive will be searchable as files (the data will only be stored as files and not in a relational database); this does not allow individual measurements to be extracted. However the files themselves can be indexed in a similar way as satellite files and it will be possible to get the list of files matching some user criteria (area, time frame, ship id, etc.). This capability will be available around KO + 6 months.

3.6 International SST FRM Radiometer Network (ISFRN)

The project team are involved in daily working with shipborne radiometer colleagues and other climate scientists worldwide. They therefore have useful personal networks within the climate and shipborne radiometer user community, and a deep appreciation of the concerns and perspectives of the radiometer network community regarding *in situ* climate data.

The project scientists will actively engage with the SST climate community during this project. The team will continue to present the results of the SST validation activities at international conferences (e.g. Eumetsat, Living Planet) and at GHRSST meetings with the aim of encouraging more groups to join the network and contribute match-ups from new regions. The data will be available to professional users via the ISFRN and Ifremer web portals.

The ISFRN will be a development of the existing "International Shipborne Radiometer Network" website hosted by NOCS at http://www.shipborne-radiometer.org/. The ISFRN website will also use, or reference, information from the ISAR and SISTeR websites, http://www.isar.org.uk/ and https://www.ralspace.stfc.ac.uk/Pages/SISTeR.aspx, respectively.

The team will look for opportunities to contribute short articles to journals and magazines, including media intended for the general public. One idea under consideration is to provide contributions to the media produced by the ship operators, setting out the environmental benefits of the radiometer deployments.

4. MANAGEMENT

4.1 Lines of communication

Figure 3.1 shows the lines of communications between the members of the consortium. At the top level, the project activities are co-ordinated by Wilson and Kelliher. Within the Project Science Team, a free flow of ideas is encouraged, co-ordinated by Wimmer. In the unlikely event of disagreements occurring within the team, directors or senior staff from the organisations concerned will meet to resolve the issues.

Communications between team members are facilitated by e-mail, Skype or telephone conference calls, availability of approved documentation on the project website and dynamic documents on the project ISFRN website. Project team contact details are maintained in the document, 'SLSTR-SST-FRM-Validation Project Directory', which can be edited by the Project manager or individuals as their contact details change.

4.2 Project Control

Management control organisation

The Project Manager (PM) will hold monthly telecons to review progress of all active work packages (WPs). Progress and matters arising, will be reviewed by the PM who will ensure she has adequate grasp of the scientific/technical matters arising, so that this review can be properly informed. Where necessary, the PM will arrange in advance for other team members to participate in the telecon if substantial or complex matters require high-level discussion. Alternatively, the PM will organize topic-specific telecons for these discussions.

In the event of a conflict between achieving science goals and maintaining the project schedule, the Project Manager will liaise with the Technical Lead and the Project Scientists to agree an approach. The proposed approach will then be discussed with the Agency's Technical Officer and iterated with the project team as needed.

The Project Manager will keep ESA's Technical Officer informed of any issues that affect the project deliverables and schedule, supported by the Technical Lead when the issue requires a discussion between the project team and ESA about the scientific content of a deliverable.

Configuration and Document Management

The procedure for naming and controlling configurable items (documents, data sets, etc) are defined in section 7.2.

All documents are peer reviewed by suitably qualified personnel within the team and approved by the Project Manager as drafts for review by the Agency's Technical Officer. The Project Manager ensures that the author(s) of the document respond in a timely fashion to any comments raised by the Agency's Technical Officer. Once the comments have been addressed, the document is accepted by the Agency's Technical Officer, issued formally and loaded onto the project website by the Project Manager.

4.3 Project Reviews and Meetings

Types of Meeting

The following types of meeting will be held during the project:

- Kick-off meeting, via WebEx

- Skype or WebEx progress meetings
- Face to face progress meetings, at contractor premises
- ISFRN Service Review Meeting
- Final meeting, at ESA premises

Meeting Schedule

The meeting schedule will be maintained by the Project Manager in the document, 'SLSTR-SST-FRM-Validation Meeting dates', which will be accessible by all members of the project team, including the Agency's Technical Officer, via the ISFRN website.

The meeting schedule is shown in Appendix B.

Arrangements for Meetings

The Project Manager will co-ordinate the arrangements for formal meetings. She will circulate a draft agenda and logistical information at least four weeks in advance. If applicable, data packs for meetings will be circulated at least one week before the meeting, to allow time for review. Dates for all meetings are available on 'SLSTR-SST-FRM-Validation Meeting dates'.

The Project Manager is responsible for drafting the minutes of the meeting and issuing the draft within one week of the meeting. Any actions arising from the meeting are recorded in the actions database, which will be maintained in the document, 'SLSTR-SST-FRM-Validation Actions'.

Progress Meetings

Progress meetings will cover:

- Progress status of the work and reporting of achievements
- Status of the deliverables
- Identification of current and potential problems
- Consolidation of action plans for the next period of the project

Based on the outcome of the meeting, the project team will make any necessary revisions to its work-plan for the following period.

Conduct of Reviews

It is anticipated that most of the workload associated with reviewing of deliverables will be handled by e-mail and teleconference.

Based on the outcome of the Final Meeting for Phase 1, the project team will make any necessary revisions to its work-plan for Phase 2. This will be reflected in an updated project Management Plan and possibly a Contract Change Notice.

Change Reviews

Change Review Boards will be convened if necessary to consider the management, technical, interface, schedule, contractual and cost issues associated with any Change Proposals that might be raised by ESA or by the project team. Change Review boards will comprise (as a minimum) the Agency's Technical Officer, the Technical Lead, the Project Manager, and representatives from any partner affected by the Change Proposal.

4.4 Progress Reporting

Within the team, formal reporting will take place on a monthly basis. The monthly report provides a basis on which to assess progress against schedule, and to institute recovery plans wherever problems are detected. The report will be collated by the Project Manager at the end of each month and forwarded to the Agency's Technical Officer and to the team members.

The content of each monthly report will be as follows:

- Executive Summary
- Overview of progress by the Project Manager
- Detailed progress by work package, including plans for the next period and any difficulties encountered or anticipated
- Actions status (a list of all open actions)
- Updated project schedule
- Updated meetings status (a list of all forthcoming meetings)
- Deliverables status list

In the event that a problem arises that might have a major effect on the schedule or scope of the work, the Project Manager will inform the ESA Technical Officer immediately via email.

4.5 Actions Log

An actions log, 'SLSTR-SST-FRM-Validation Actions', will be maintained online, allowing actions to be reviewed by teleconference participants, and allowing status changes to be made in real time.

'SLSTR-SST-FRM-Validation Actions' will be organised in tabular form. Each entry will describe the action, who is responsible, the target date, status (open / closed), and any progress towards completion.

'SLSTR-SST-FRM-Validation Actions' will be accessible by all team members at all times. The database format allows information such as open actions to be extracted and copied into monthly progress reports, for example.

The Project Manager will review the status of the open actions at the start of each week and will send out reminders to actionees when the completion date approaches.

4.6 Quality Management

The Project Manager will ensure that quality management procedures are in place and are being observed by the project team. This includes ensuring that:

- Document and configuration control procedures are followed
- Deliverable documents and data sets are reviewed before being issued
- Baseline configurations are defined and observed
- Data security measures (e.g. back-ups) are performed regularly
- Deficiencies in QA procedures are addressed.

Quality Assurance is addressed in section 7 and focuses on two key areas:

- Data quality
- Configuration and document management

4.7 Risk Management

In a project of this nature, the main risks are threats to the continuing operation of the instruments, despite the best endeavours of the team. Another significant risk is that team members with specialised knowledge may become unavailable for one of a number of reasons. A summary of the critical issues identified to date are contained in Section 5. Where further risks are identified, they will be assessed, and significant risks will be documented in the online document, 'SLSTR-SST-FRM-Validation Risks' to facilitate tracking and reporting.

For each significant risk, the following is recorded and updated as necessary:

- Description of risk
- Likelihood of occurring (high / medium / low)
- Impact if it does occur (high / medium / low)
- Owner (responsible for monitoring and reassessing)
- Mitigation strategies to be employed.

4.8 Document Review Cycle

Reviewing of documents is scheduled by the Project Manager in consultation with the Agency's Technical Officer and is handled by e-mail and teleconference.

4.9 Travel and Meeting Plan

The table in Annex B summarises the planned meeting schedule for the project. The current version of the meeting schedule is maintained as the online document, 'SLSTR-SST-FRM-Validation Meeting Dates'.

5. ANALYSIS OF RISK FACTORS AND MITIGATION STRATEGIES

A summary of the main problem areas/technical constraints and associated mitigation strategies is presented below.

Table 5-1 – Risk Identification and Mitigation Strategies

Problem Area	Description	Mitigation Strategies	Likelihood (H/M/L)	Impact (H/M/L)	Owner
Availability of radiometers	A radiometer may fail onboard a ship for any number of reasons	Ensure a spare radiometer is available to install next time the ship is in its home port. Ensure spare parts are available to quickly repair and test the failed unit.	L	H	Operator
Availability of ships	Ship owner may decide to no longer support the radiometer or the ship may be decommissioned.	Negotiate an alternative ship for the radiometer.	L	H	Operator
Availability of SLSTR data	Data may not be available	If temporary, wait for data to become available before processing for match-ups. If permanent, switch to processing alternative satellite data.	L	L	Operator
Availability of key personnel	Key personnel may not be available at certain times due to sickness or holiday.	Several team members share relevant knowledge so if one person is away another can temporarily do some work and/or answer questions on their behalf	M	L	PM
Loss of ship to shore communication	IRDIUM/satellite link is lost and access to instrument during deployment is lost	Plan for extra maintenance trip, to get data and check on the instrument performance.	L	L	Operator
Loss of key staff	Key staff member may leave job or be made redundant	Use procedures and documentation to train new staff member.	L	M	Operator
Loss of key facilities	Laboratory space dedicated to the project becomes unavailable.	Move to another laboratory space in the same facility.	L	M	Operator
Loss of computing facilitates	Key processing software/processing computers becomes unavailable.	Make regular back-ups, ensure hardware is well maintained, transfer to new hardware.	L	M	Operator

6. WORK PLAN

6.1 Deliverable Items

6.1.1 International SST FRM Radiometer Network (ISFRN)

The ISFRN will be a development of the existing "International Shipborne Radiometer Network" website hosted by NOCS at http://www.shipborne-radiometer.org/.

The ISFRN website will also use, or reference, information from the ISAR and SISTeR websites, http://www.isar.org.uk/ and https://www.ralspace.stfc.ac.uk/Pages/SISTeR.aspx, respectively.

The title of the ISRN website will be changed to ISFRN.

The existing pages of the ISRN website are as follows:

- Home – containing the overall aims and scope of the network.

  This page will be revised to provide a description of the ISFRN.

- Aim – elaborating on the aim of the network

- Instruments – describing ISAR and SISTeR.

- Partners – listing the funding agencies and contractors involved in the network.

  This page will be revised to provide contact information as well.

- Documents – currently providing links to the ISRN Development Plan and the book "Optical Radiometry for Ocean Climate Measurements".

  This page will be revised to provide access to the documents to be produced under this contract (ARCH deliverable D-40).

- Tools – currently a placeholder for information and links to generic software tools and instrument-specific tools.

  This page will be expanded to provide a full technical description of the validation methodology, as well as procedures and protocols (deliverable D-60). These will generally be short summaries with links to the appropriate documents.

- Members - providing password protected access to information restricted to ISRN members

- This page will be dedicated to the SLSTR-SST-FRM-Validation service. The CIP (deliverable D-20) and CARL (deliverable D-30) will be hosted in this section of the website.

The following pages will be added to the ISRN website:

- Dedicated pages for the SLSTR-SST-FRM-Validation service. This will include 3 sets of pages, one for each ship, with a log of data collected, copies of the ship track, links to sites showing the ships' current positions, satellite data match-ups and validations results for each deployment (QC deliverable D-50). Links to the data portal at Ifremer will be provided. Historical deployments will also be added. Dedicated pages for other international projects falling under the ISFRN banner. These will contain a description of the project and links to the project websites. Potential examples include ISARs deployed in China, Japan, USA and Australia, and M-AERI. Any such pages will require the approval of the organisation concerned.

- A calendar of meetings and events will be added, probably to the home page.
- Links to a Twitter account will be added to the home page. The Twitter account will be set up to elicit feedback and comments on interesting and newsworthy items to be posted by members of the consortium.
- A page will be set up with links to other sites of interest.
- A page will be set up for news stories. The aim is to provide a new story each month.

The ISFRN website will be maintained for the duration of the project.

The ISFRN website will link to the service data and documentation portal hosted by Ifremer. All data acquired by the radiometers will be delivered directly to the Ifremer site by the radiometer operators.

6.1.2 ISFRN Service Review Meeting Deliverable

An ISFRN Service Review meeting (REVIEW deliverable D-130) will be held at NOCS over a two day period. For the baseline meeting at NOCS, we will be able to accommodate 60 – 100 people, as required.

SCL will organise the meeting in conjunction with UoS and ESA. The task will include the provision of logistics support (travel and subsistence) to specially invited participants. Such arrangements will be agreed with the ESA Technical Officer.

The proceedings of the review meeting (PROC deliverable D-140) will be submitted for publication in a scientific journal. Options for the particular journal we wish to approach will be discussed at the KO meeting.

6.1.3 Software Deliverables

The software deliverable consists of a full copy of all the processed FRM data used for validation activities (FRMDATA deliverable D-70) and a full copy of all satellite data used for validation activities (EODATA deliverable D-80), both to be available via ftp.

The Agency's requirements concerning the format, standard and content of project data sets will be observed.

At the end of phase 1, all the document and data deliverables will be consolidated into a Technical Data Package (TDP deliverable D-170), split into 3 separate media copies to ESA using USB or HDD media.

6.1.4 Documentation Deliverables

The list of documentations deliverables is shown at Annex C and a summary is shown below.

- Campaign Implementation Plan (CIP): this will be an on-line electronic set of web pages within the ISFRN website and will include information covering:
  - campaign management and planning approach;
  - a master schedule of all campaign activities;
  - ship tracks and current position;
  - instrument operation timeliness and compatibility with the service objectives;
  - the procedure used to procure the satellite data to be validated;
  - matching satellite overpasses with ship tracks;
  - technical information on the instruments;

  - calibrating the instruments;
  - operating the instruments;
  - protocols and procedures for evaluating instrument uncertainties;
  - processing software;
  - logistics issues;
  - contact details;
  - and description of validation process.

- Campaign Actions and Risk Log (CARL): tracks the risks that the project might face in meeting its goals and proposes mitigation strategies to minimise them.

- ISFRN Data Description and User Manual (TR-1): a handbook for use of the ISFRN L2R data will be stored alongside the data giving a description of the L2R format and usage examples.

- Four papers will be delivered based on the activities and results obtained during the service.

- Service Roadmap (SR): will build on the Shipborne Radiometry Network Development Plan (ISAR-DECC-REP-14_01, 25 July 2014) that was created under the UK ATSR Satellite Dataset (ASD) contract. The SR will:
  - provide a critical analysis of the feedback from participants and institutions working in the service, including feedback from the ISFRN Service meeting;
  - articulate all lessons learned during the service;
  - identify potential strategies for integrating the service outcomes into existing initiatives and operational institutions;
  - identify priority areas to be addressed in potential future activities to support SLSTR validation activities.

- Final Report (FR): a 30-40 page "glossy" document suitable for non-technical audience, to explain the reasons for *in situ* SST FRM measurements, describing the deployments and presenting the significant results into the wider community.

Routine project management deliverable items have not been included in the summary above and the table in Appendix C.

The status of the deliverables is maintained in the document, 'SLSTR-SST-FRM-Validation Deliverable Status', which in addition to the items in the table, lists the due date, completion date and acceptance date of each deliverable, as well as comments on its status.

All deliverable documents will be made publicly available after acceptance by the Agency.

6.1.5 Project Management Deliverables

The Project Manager is responsible for the following deliverables:

- Project Management Plan (to be updated at the start of each phase)

- Project control information (e.g. schedule and actions, to be reviewed monthly)

- Monthly reports, based on information solicited from the team

- Progress meeting reports, based on information solicited from the team.

The monthly reports (see Section 4.4) provide the Agency with regular updates on the status of the project.

The ISFRN Website will be used to store project management data such as:

- Actions database, 'SLSTR-SST-FRM-Validation Actions'
  (ID, description, actionee, target date, open/closed flag, date closed, comments)
- Schedule, 'SLSTR-SST-FRM-Validation Schedule'
  The current project schedule, in PDF format
- Deliverable items status , 'SLSTR-SST-FRM-Validation Deliverables Status'
  (ID, description, target date, date submitted, date accepted, comments)
- Meetings and telecons, 'SLSTR-SST-FRM-Validation Meeting Dates'
  (dates, times, venues, etc)
- Project directory, 'SLSTR-SST-FRM-Validation Project Directory'
  (contact information for team members)
- Risk register, 'SLSTR-SST-FRM-Validation Risk Register'
- Acronyms, 'SLSTR-SST-FRM-Validation Acronyms'
- Reference Documents, 'SLSTR-SST-FRM-Validation Reference Document List'

6.2 Communications

Communications channels with other radiometry projects, with the wider science community, and with the general public are supported via the ISFRN website, the ISFRN Service review meeting and personal contact with project team members.

The main channel of communications is the project's website, which hosts deliverable documents (after acceptance by the Agency).

Talks and presentations, such as at GHRSST meetings and similar workshops, recognise the Agency's funding support and display an Agency-supplied project logo.

Standard documentation and presentation templates will be used by team members.

6.3 Work Breakdown Structure

The Work Breakdown Structure (**WBS**) is presented below. Detailed Work Package Descriptions (**WPD**s) are provided in Appendix D.

Table 6-1 – Work Breakdown Structure

Task	WP	Description	WP Leader
1	10	International Collaboration	SCL
2	20	Data Collection and Archive	UoS
	21	UoS Data Collection	UoS
	22	DMI Data Collection	DMI
	23	RAL Data Collection	RAL
	24	CIP and CARL	SCL
3	30	Data Processing and Validation Analysis	UoS
4	40	Data Delivery and Publication of Results	UoS
5	50	Management and Reporting	SCL
	51	Final Reporting	SCL

6.4 Planning

6.4.1 Work Plan

The logic of the envisioned work is shown in Figure 6-1. SST data is currently being collected routinely by the shipborne radiometers operated by UoS, RAL Space and DMI on their respective ships and routes (Task 2). These data are periodically delivered to the data archive, which for this contract, will be hosted by Ifremer at no additional cost to the project. The times when the data can be delivered depends on the schedule of the ships and the need for removal of the radiometers from the ships for post-deployment calibration.

The SST data in the archive are periodically compared to SST data derived from SLSTR-A and SLSTR-B using the Felyx tool at Ifremer and sets of match-ups between the radiometer data and satellite data are generated. These are then processed by software provided by UoS to create statistics on the performance of the SLSTRs compared to the *in situ* measurements. The data and the statistics associated with each radiometer are then validated by UoS, RAL Space and DMI, as appropriate (Task 3).

The data, match-ups and validated statistics are all then made available via the ISFRN website, which will point to the Ifremer website and perhaps others that may host relevant data (Task 4). Copies of the data will also be delivered on hard disks to ESA at the end of Phase 1.

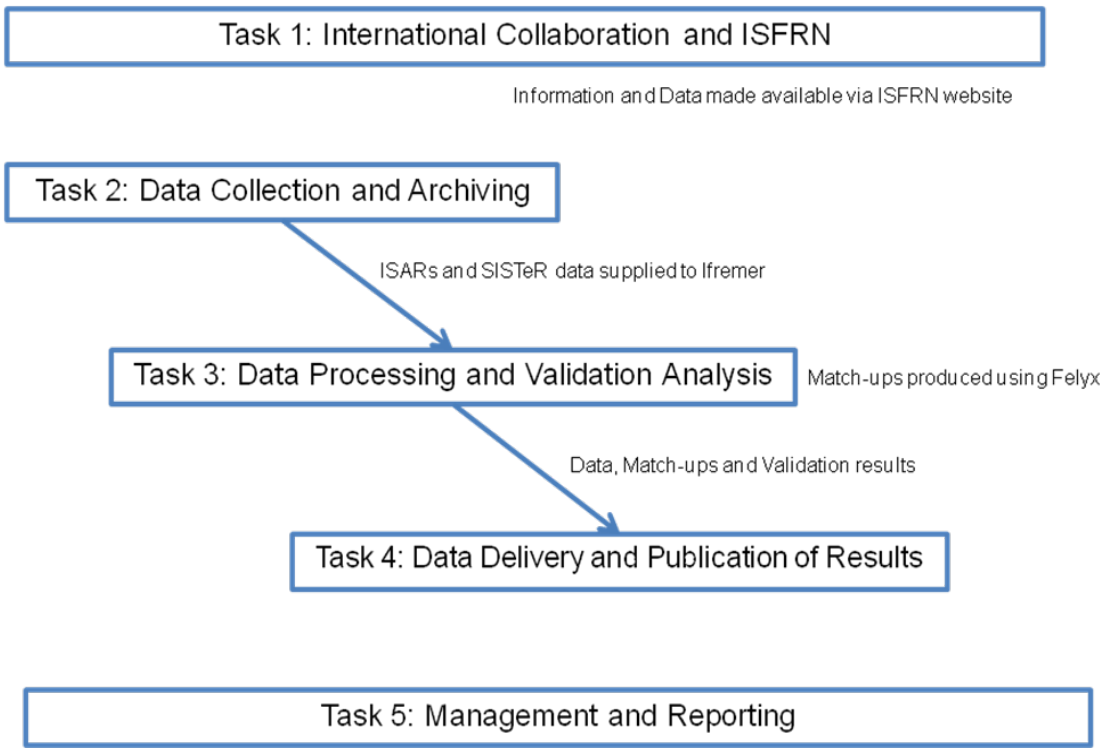

Figure 6-1: Project Workflow

The ISFRN website will be developed in parallel with the data gathering, processing and validation tasks (Task 1). The site will be a development of the existing site at http://www.shipborne-radiometer.org/ and will provide access to the project data and documentation. Task 1 also includes outreach activities such as conferences and GHRSST Science Team meetings.

The project management activities (Task 5) will run continuously for the duration of the project. Towards the end of Phase 1, the project management team will organise ISFRN Service Review meeting, which is baselined to take place at NOCS.

6.4.2 Milestones

Phase 1 of the project is planned to run from 1 April 2018 to 31 March 2019.

Table 6.2 shows the proposed milestones, identifying the relevant documents for each milestone. The documents are referred to by their acronym plus a number which indicates which of three reprocessing cycles the document is most relevant to. Not all documents are relevant to every reprocessing. The milestones are based on the milestone table defined in the SOW and the draft Contract.

Table 6-2 – Contractual Milestones

Date	Milestone	Milestone Description
KO 05-04-18	M0	Data Pack (1 October 2017 to 31 March 2018)
KO + 6 05-10-18	M1	Delivery and acceptance of updated documents: • D-10 (ISFRN), D-20 (CIP), D-30 (CARL), D-40 (ARCH), D-60 (TR-1), D-70 (FRMDATA), D-80 (EODATA)
KO + 12 05-04-19	M2	Delivery and acceptance of remaining documents: • D-50 (QC), D-90 (Paper 1), D-100 (Paper 2), D-130 (REVIEW), D-140 (PROC), D-150 (SR), D-160 (FR), D-170 (TDP), D-180 (MPRs)

The milestone plan for Phase 2 will be agreed with ESA once Phase 2 is approved.

6.4.3 Schedule

The figures in Appendix A show the project schedule.

The assumed start date is 1 April 2018. The duration of the project is 24 months, separated into two 12 month phases. The bars reflect the fact that all the activities are continuous and ongoing, except for the Final Reporting work package, WP51.

Several work packages are continuing activities funded until now by contracts including the ASD contract that ran from 2004 until 31 October 2017; these are shown continuing from 1 October 2017. These cover the data collection work packages, WP 21, 22 and 23, which reflect the ongoing deployments of ISARs and SISTeR. WP 30 recognises that the pre- and post- calibration of the shipborne radiometers is also a continuing activity from the ASD contract. WP40 recognises that the core of the Data Description and User Manual exists already and is under review within GHRSST.

WP10 is also an ongoing activity as a form of the ISFRN exists at http://www.shipborne-radiometer.org/; this website will be modified and expanded to meet ESA's requirements, as described in section 2.3.2

The start dates of other work packages are shown later e.g. the first datasets are likely to provided to the archive at Ifremer in May 2018 (WP20) and the match-up generation and SST

validation activities (WP40) that follow from this will start a little later. Thereafter the activities will be performed at intervals that depend on the length of radiometer deployments as outlined in the CIP.

The schedule for Phase 2 of the project is shown in Figure A-2. The schedule reflects that all the tasks are ongoing from Phase 1 and that there are no new documents to create, just existing ones to maintain.

7. QUALITY ASSURANCE

7.1 Data Quality

Quality issues relating to the data will be handled as part of the relevant Work Package.

7.2 Configuration and Document Management

The Project Manager is the main point of contact for quality assurance issues relating to configuration and document management.

The Project Document Library (PDL) is stored on the Project website, and all documents approved by ESA are available for download.

Standard document templates have been produced for commonly used documents.

7.2.1 Document Filenames and Reference Numbers

The procedure for naming and controlling configurable items (documents, data sets, etc) is defined below.

Document reference numbers will adhere to the following format:

SST_FRM-aaa-bbb-2nn with a separate field for e.g. **"Issue 1"** or **"Draft A"**

Document filenames will adhere to the following format:

SST_FRM-aaa-bbb-2nn_[date]_issue/draft-x-[signed]

where: aaa = document type
bbb = company code (UOS, DMI, RAL, SCL, ESA)
2nn = sequential number (starting with 2 indicates a Phase-II document)
date = date in format yyyy-mm-dd e.g. 2014-02-28 [only for use with MPRs]
issue/draft-x = 'Issue' and a number (1, 2, 3, etc) e.g. Issue-1 or
'Draft' and a single letter (a, b, c, etc) e.g. Draft-A
[signed] = 'signed', to indicate when a document has been approved by ESA

The document types are:

ARCH	Archive of service data and documentation
CARL	Campaign Actions and Risk Log
CCS	Contract Closure Summary
CIP	Campaign Implementation Plan
FR	Final Report
TDP	Technical Data Package
TR-1	ISFRN data description and user manual
MIN	Minutes of Meeting
MPR	Monthly Progress Report
PMP	Project Management Plan
PROC	ISFRN service review meeting proceedings

SR	Scientific Roadmap
TN	Technical Note

All documents will be peer reviewed by suitably qualified personnel within the team and approved by the Project Manager as drafts for review by the Agency's Technical Officer.

As a document goes through the preparation, various drafts will be produced, for example:

SST_FRM-CIP-SCL-201_Draft-A	- draft issue for internal comment
SST_FRM-CIP-SCL-201_Draft-A (initials)	- reviewed copy of Draft A
SST_FRM-CIP-SCL-201_Draft-B	- draft issue for ESA review

The Project Manager will ensure that the author(s) of the document respond in a timely fashion to any comments raised by the Agency's Technical Officer on the draft document. Once the comments have been addressed, the document is accepted by the Agency's Technical Officer, issued formally and a signed pdf copy will be loaded onto the project website by the Project Manager.

The acceptance cycle will include various issues, for example:

SST_FRM-CIP-SCL-201_Issue-1	- first issue for signature
SST_FRM-CIP-SCL-201_Issue-1-signed	- signed and approved first issue

APPENDIX A SCHEDULE

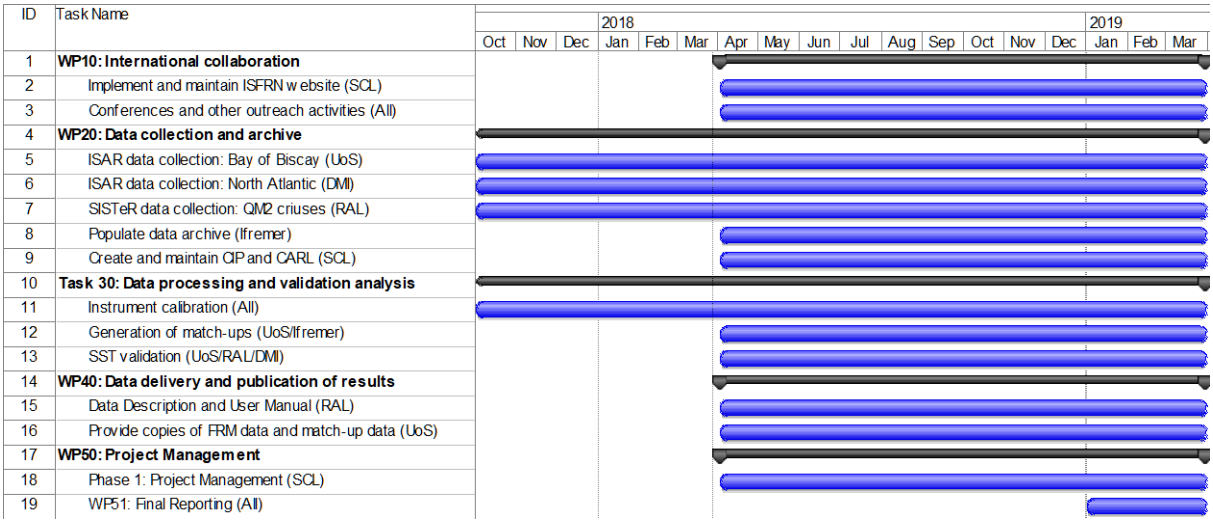

Figure A-1: Project Schedule for Phase 1

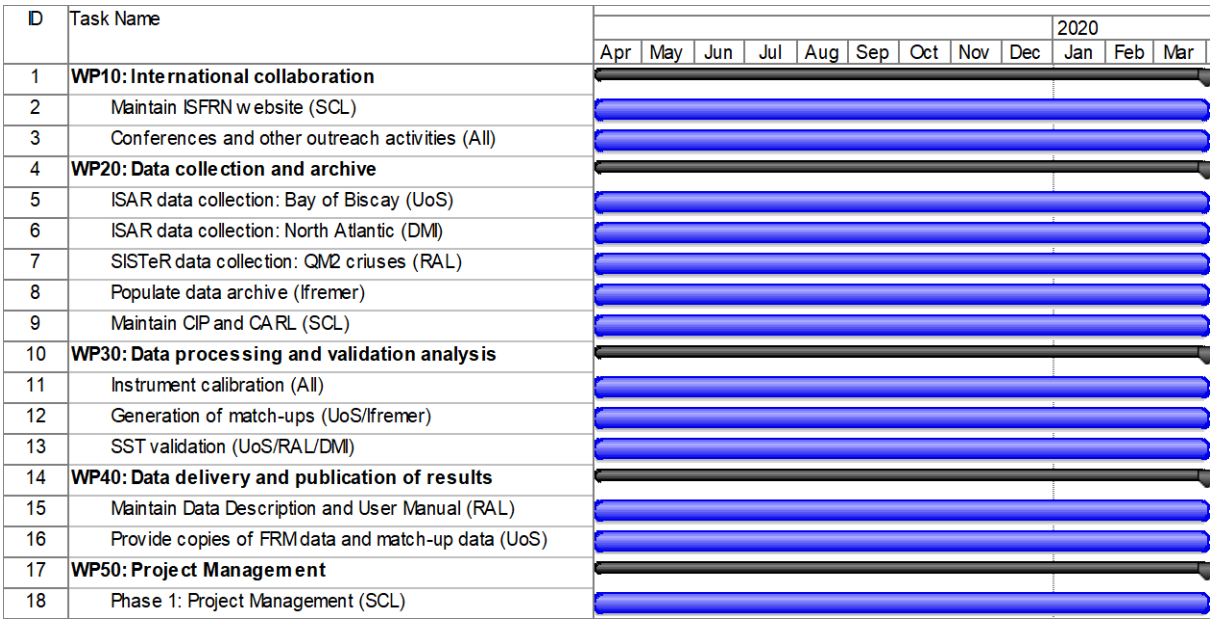

Figure A-1: Project Schedule for Phase 2

APPENDIX B MEETING SCHEDULE

The table below shows the formal meetings to be attended by team members in Phase-1 and Phase-2.

Meeting	Venue	When?	Days	Date	Attendees				
		(month)			ESA	UoS	RAL	DMI	SCL
KO	WebEx	KO	0.5	05-04-18	X	X	X	X	X
PM-1	WebEx	KO + 3	0.5	10-07-18	X	X	X	X	X
PM-2	WebEx	KO + 6	0.5	~ 05-10-18	X	X	X	X	X
PM-3	WebEx	KO + 9	0.5	~ 05-01-19	X	X	X	X	X
ISFRN Review	NOCS	KO + 10	2	~ 05-02-19	X	X	X	X	X
FM Phase 1	WebEx	KO + 12	1	~ 05-04-19	X	X	X	X	X
PM-4	WebEx	KO + 18	1		X	X	X	X	X
FM Phase 2	ESRIN	KO + 24	2		X	X	X	X	X

APPENDIX C DELIVERABLES

The following table lists the deliverable items and their associated work package.

ID	Description	Lead	WP	Due date
D-10	International SST FRM Radiometer Network (**ISFRN**) web portal	RW	10	KO + 3 (initial version) Monthly updates
D-20	Campaign Implementation Plan (**CIP**) on the web	RW	24	KO + 3 (initial version) Monthly updates
D-30	Campaign Actions and Risk Log (**CARL**) on the web	RW	24	KO + 3 (initial version) Monthly updates
D-40	Service data and document archive (**ARCH**) on the web	WW, JH, TN	21, 22, 23	KO + 3 (initial version) Progress meetings
D-50	Update **ARCH** and **ISFRN** web pages with data and log entries (**QC**)	WW	30	KO + 3 (initial version) Progress meetings
D-60	**ISFRN** data description and user manual (**TR-1**) on the web	WW	40	KO + 6
D-70	A full copy of all processed FRM data used for validation activities (**FRMDATA**)	WW	40	KO + 6 Monthly updates
D-80	A full copy of all satellite data used for validation activities (**EODATA**)	WW	40	KO + 6 Monthly updates
D-90	**Paper 1**	WW	51	End of Phase 1
D-100	**Paper 2**	TN	51	End of Phase 1
D-110	**Paper 3**	JH	51	Contract End
D-120	**Paper 4**	WW	51	Contract End
D-130	**ISFRN** service review meeting (**REVIEW**)	RW	51	KO + 10
D-140	**ISFRN** service review meeting proceedings (**PROC**)	RW	51	KO + 10
D-150	Scientific Roadmap (**SR**)	RW	51	KO + 10
D-160	Final Report (**FR**)	RW	51	KO + 10
D-170	Technical Data Package (**TDP**) – via ftp	RW	51	KO + 10
D-180	Executive monthly progress report and actions database (MR)	RW	51	Monthly
D-190	Contract Closure Summary (**CCS**)	RW	51	Contract End

APPENDIX D WORK PACKAGE DESCRIPTIONS

WORK PACKAGE DESCRIPTION

Project:	SLSTR-SST-FRM-Validation	**Phase:**	**WP Nº:** 10
WP Title:	International Collaboration		

Contractor:	SCL	**Sheet:**	1 of 1
Start Event:	KO	**Issue:**	1
End Event:	End of Contract	**Date:**	16-10-2017
WP Manager:	Ruth Wilson	**Effort:**	417 hours

Summary of Effort:

Name	Phase 1 hrs	Phase 2 hrs	Total hrs
Werenfrid Wimmer	75	47	122
Tim Nightingale	35	15	50
Jacob Hoyer	10	10	20
Ruth Wilson	135	90	225
Totals	255	162	417

Aims:

- Co-operate with international scientists and groups to promote an SST FRM radiometer network.
- Create and maintain the International SST FRM Radiometer Network (ISFRN).
- Promote the results of the project through meetings and media.

Inputs:

- Proposal
- Information and results from WPs 20, 30 and 40.

Tasks:

- Co-operate with other scientists involved in SST validation using shipborne radiometers.
- Co-operate with SST groups e.g. GHRSST and Sentinel-3 groups e.g. S3VT
- Create and maintain the International SST FRM Radiometer Network (ISFRN) website.
- Present the project results at meetings and in the media, as opportunities arise

Outputs:

- ISFRN web portal (D-10)
- Contributions to monthly reports (D-180) and progress meetings

WORK PACKAGE DESCRIPTION

Project:	SLSTR-SST-FRM-Validation	**Phase:**	1 & 2	**WP Nº:**	20
WP Title:	Data Collection and Archive				
Contractor:	University of Southampton			**Sheet:**	1 of 1
Start Event:	KO			**Issue:**	1
End Event:	End of contract			**Date:**	12-10-2017
WP Manager:	Werenfrid Wimmer			**Effort:**	72 hours

Summary of Effort:

Name	Phase 1 hrs	Phase 2 hrs	Total hrs
Werenfrid Wimmer	12	10	22
Jacob Hoyer	20	10	30
Tim Nightingale	10	10	20
Totals	42	30	72

Aims:

- Coordinate DMI, RAL and UoS deployment strategy and protocols

Inputs:

- DMI, RAL and UoS instruments and ship routes
- Protocols and procedures for the collection traceable SST measurements

Tasks:

- Plan deployments to avoid overlaps and ensure maximum coverage
- Have regular teleconferences to discuss data collection status and any issues.

Outputs:

- Reports from the teleconferences.
- Update protocols and deployment manuals were appropriate
- Updates to the ISFRN web page.

WORK PACKAGE DESCRIPTION

Project:	SLSTR-SST-FRM-Validation	**Phase:**	1 & 2	**WP Nº:**	21
WP Title:	UoS Data Collection				
Contractor:	University of Southampton			**Sheet:**	1 of 1
Start Event:	KO			**Issue:**	1
End Event:	End of contract			**Date:**	12-10-2017
WP Manager:	Werenfrid Wimmer			**Effort:**	1652 hours

Summary of Effort:

Name	Phase 1 hrs	Phase 2 hrs	Total hrs
Werenfrid Wimmer	236	170	406
Ray Holmes	780	466	1246
Totals	1016	636	1652

Aims:

- Ensure ISAR operation and data collection is maintained on the Pont Aven or similar ferry

Inputs:

- ISAR instruments 002 and 003
- UoS facilities at NOCS
- Continued access to the *Pont Aven* or equivalent ferry to install and operate an ISAR.
- Protocols and procedures for the collection traceable SST measurements

Tasks:

- Monitor ISAR instrument operation on the *Pont Aven* or equivalent ferry
- Liaise with deck officers and engineers on *Pont Aven* or equivalent ferry
- Quality assurance of ISAR data, including pre- and post-deployment lab validations
- ISAR instrument maintenance
- Regularly process the ISAR data to ISFRN L2R format and update the Archive with calibrated skin SST with associated uncertainties.

Outputs:

- Calibrated, quality controlled and traceable SST skin data records in L2R format (D-40)
- Instrument documentation and reports
- Input to reports and scientific papers
- Updates to the ISFRN web page.

WORK PACKAGE DESCRIPTION

Project:	SLSTR-SST-FRM-Validation	**Phase:**	**WP Nº:** 22
WP Title:	DMI Data Collection		
Contractor:	STFC		**Sheet:** 1 of 1
Start Event:	KO		**Issue:** 1
End Event:	KO + 18 months		**Date:** 12-10-2017
WP Manager:	Jacob Høyer		**Effort:** 203 hours

Summary of Effort:

Name	Phase 1 hrs	Phase 2 hrs	Total hrs
Høyer	103	100	203
Totals	103	100	203

Aims:

- Deploy the ISAR radiometer on the Smyril Line passenger ferry from Denmark to Iceland to collect high quality, traceable radiometric measurements of the sea surface
- Derive traceable estimates of the sea surface skin temperature and associated uncertainties from the ISAR radiometric measurements
- Deliver formatted and quality controlled SST products to the data archive

Inputs:

- DMI ISAR instruments 008
- Access to Smyril Line ferry, M/S Norröna
- ESA RFQ “ESA/RFQ/3-15078/17/I-SBo”
- Consortium proposal “SLSTR-SST-FRM-Validation” (this document)
- Protocols and procedures for the collection traceable SST measurements [FRM4STS, Zibordi et al.,2014]

Tasks:

- Carry out regular deployments of the DMI ISAR radiometer on the Norröna passenger ferry or equivalent to collect radiometric measurements of the sea surface.
- Validate the radiometric calibrations of the DMI radiometer against a blackbody reference before and after every deployment, following best practice.
- Generate formatted products containing traceable estimates of brightness temperature, sea surface skin temperature and associated uncertainties from the radiometric measurements.
- Quality control the data products, to include checking of the formats, science variables and flags.
- Deliver quality-controlled, traceable SST products to the data archive in a timely fashion.
- Report on the status of ISAR 008 deployment and datasets, as required.
- Maintain the ISAR 008 radiometer to ensure reliable, traceable operation.
- Maintain the ISAR data processor and auxiliary files to ensure the generation of traceable SST products.
- Maintain and update instrument documentation as required, including data formats, protocols and procedures.

Outputs:

WORK PACKAGE DESCRIPTION

Project:	SLSTR-SST-FRM-Validation	**Phase:**	**WP Nº:** 22
WP Title:	DMI Data Collection		

- Calibrated, quality controlled and traceable SST skin data records in L2R format (D-40)
- Operational ISAR 008 instruments and processor
- Instrument documentation and reports

References:

Zibordi, G., Donlon, C. J., & Parr, A. C. (2014). *Optical radiometry for ocean climate measurements* (Vol. 47). Academic Press.

WORK PACKAGE DESCRIPTION

Project:	SLSTR-SST-FRM-Validation	**Phase:**	**WP Nº:** 23
WP Title:	RAL Data Collection		

Contractor:	STFC	**Sheet:**	1 of 1
Start Event:	KO	**Issue:**	1
End Event:	KO + 18 months	**Date:**	12-10-2017
WP Manager:	Tim Nightingale	**Effort:**	170 hours

Summary of Effort:

Name	Phase 1 hrs	Phase 2 hrs	Total hrs
Tim Nightingale	65	40	105
Eleanor Barber	35	30	65
Totals	100	70	170

Aims:

- Deploy the SISTeR instrument on the *Queen Mary 2* liner to collect high quality, traceable radiometric measurements of the sea surface
- Derive traceable estimates of the sea surface skin temperature and associated uncertainties from the SISTeR radiometric measurements
- Deliver formatted and quality controlled SST products to the data archive

Inputs:

- ESA RFQ “ESA/RFQ/3-15078/17/I-SBo”
- Consortium proposal “SLSTR-SST-FRM-Validation” (this document)
- Protocols and procedures for the collection traceable SST measurements

Tasks:

- Carry out regular deployments of a SISTeR radiometer on the *Queen Mary 2* liner to collect radiometric measurements of the sea surface
- Validate the radiometric calibrations of the SISTeR radiometers before and after every deployment, following best practice
- Generate formatted products containing traceable estimates of brightness temperature, sea surface skin temperature and associated uncertainties from the radiometric measurements
- Quality control the data products, to include checking of the formats, science variables and flags
- Deliver quality-controlled, traceable SST products to the data archive in a timely fashion
- Report on the status of SISTeR deployments and datasets, as required
- Maintain the SISTeR radiometers to ensure reliable, traceable operation
- Maintain the SISTeR data processor and auxiliary files to ensure the generation of traceable SST products
- Maintain and update instrument documentation as required, including data formats, protocols and procedures

Outputs:

- Operational SISTeR instruments and processor
- Quality-controlled and traceable SST products (D-40)

WORK PACKAGE DESCRIPTION

Project:	SLSTR-SST-FRM-Validation	**Phase:**	**WP Nº:** 23
WP Title:	RAL Data Collection		

- Instrument documentation and reports

WORK PACKAGE DESCRIPTION

Project:	SLSTR-SST-FRM-Validation	**Phase:**	**WP Nº:** 24
WP Title:	CIP and CARL		

Contractor:	SCL	**Sheet:**	1 of 1
Start Event:	KO	**Issue:**	1
End Event:	End of Contract	**Date:**	16-10-2017
WP Manager:	Ruth Wilson	**Effort:**	155 hours

Summary of Effort:

Name	Phase 1 hrs	Phase 2 hrs	Total hrs
Werenfrid Wimmer	12	10	22
Jacob Hoyer	10	10	20
Ruth Wilson	68	45	113
Totals	90	65	155

Aims:

- Make information and data available on all aspects of the radiometer deployments to users and the project team, as appropriate.

Inputs:

- Proposal
- Information and results from WPs 20, 30 and 40.

Tasks:

- Create and maintain the Campaign Implementation Plan (CIP) on the ISFRN website.
- Create and maintain the Campaign Actions and Rick Log (CARL) on the ISFRN website.

Outputs:

- Campaign Implementation Plan (D-20)
- Campaign Actions and Rick Log (D-30)

WORK PACKAGE DESCRIPTION

Project:	SLSTR-SST-FRM-Validation	**Phase:**	1 & 2	**WP Nº:**	30
WP Title:	Data Processing and Validation Analysis				
Contractor:	University of Southampton			**Sheet:**	1 of 1
Start Event:	KO			**Issue:**	1
End Event:	End of contract			**Date:**	12-10-2017
WP Manager:	Werenfrid Wimmer			**Effort:**	437 hours

Summary of Effort:

Name	Phase 1 hrs	Phase 2 hrs	Total hrs
Werenfrid Wimmer	195	82	277
Nightingale	75	15	90
Høyer	50	20	70
Totals	320	117	437

Aims:

- Ensure ISFRN L2R data is processed in a timely manner and submitted to the archive
- Produce the Validation analysis and report on a regular basis

Inputs:

- ISAR and SISTeR L2R data
- Felyx MDB generation instance
- UoS Felyx MDB analysis software

Tasks:

- Regularly process the ISAR data to ISFRN L2R format and update the Archive with calibrated skin SST with associated uncertainties.
- Process Felyx MDB and generate validation reports

Outputs:

- Felyx MDB files (part D-50)
- Validation plots and report (part D-50)
- Input to reports and scientific papers
- Updates to the ISFRN web page (part D-50)

WORK PACKAGE DESCRIPTION

Project:	SLSTR-SST-FRM-Validation	**Phase:**	1 & 2	**WP Nº:**	40
WP Title:	Data Delivery and Publication of Results				

Contractor:	University of Southampton	**Sheet:**	1 of 1
Start Event:	KO	**Issue:**	1
End Event:	End of contract	**Date:**	12-10-2017
WP Manager:	Werenfrid Wimmer	**Effort:**	376 hours

Summary of Effort:

Name	Phase 1 hrs	Phase 2 hrs	Total hrs
Werenfrid Wimmer	130	82	212
Nightingale	35	15	50
Høyer	70	44	114
Totals	235	141	376

Aims:

- Ensure all campaign data is submitted to ESA
- Produce the ISFRN data description and user manual (TR-1)

Inputs:

- ISAR and SISTeR L2R data
- Felyx MDB files
- ISAR and SISTeR instrument documentation and procedures

Tasks:

- Produce a copy of the SISTeR and ISAR data on HDD and send to ESA
- Produce a copy of the SLTSR/Felyx data on HDD and send to ESA
- Compile the ISFRN data description and user manual
- Produce scientific papers

Outputs:

- Hard disks with data (D-60 and D-80)
- ISFRN data description and user manual (TR-1)
- Scientific papers (D-90, D-100, D-110, D-120)

WORK PACKAGE DESCRIPTION

Project:	SLSTR-SST-FRM-Validation	**Phase:**	**WP Nº:** 50
WP Title:	Management and Reporting		

Contractor:	SCL	**Sheet:**	1 of 1
Start Event:	KO	**Issue:**	1
End Event:	End of Contract	**Date:**	16-10-2017
WP Manager:	Ruth Wilson	**Effort:**	521 hours

Summary of Effort:

Name	Phase 1 hrs	Phase 2 hrs	Total hrs
Werenfrid Wimmer	60	47	107
Eleanor Barber	35	30	65
Jacob Hoyer	60	30	90
Ruth Wilson	68	78	146
Hugh Kelliher	68	45	113
Totals	291	230	521

Aims:

- Ensure successful running of the project.

Inputs:

- Proposal
- Contract
- Information from WPs 10, 20, 30 and 40.

Tasks:

- Maintain project management interface to ESA and to all team members.
- Monitor work schedules of team members, and compile and issue monthly reports (MR).
- Schedule, prepare for and attend all meetings, and produce minutes.

Outputs:

- Monthly progress reports (D-180)

WORK PACKAGE DESCRIPTION

Project:	SLSTR-SST-FRM-Validation	**Phase:**	**WP Nº:** 51
WP Title:	Final Reporting		

Contractor:	SCL	**Sheet:**	1 of 1
Start Event:	KO + 15	**Issue:**	1
End Event:	KO + 18	**Date:**	16-10-2017
WP Manager:	Ruth Wilson	**Effort:**	128 hours

Summary of Effort:

Name	Phase 1 hrs	Phase 2 hrs	Total hrs
Werenfrid Wimmer	15		15
Eleanor Barber	35		35
Jacob Hoyer	20		20
Ruth Wilson	45		45
Hugh Kelliher	13		13
Totals	128		128

Aims:

- Consolidate the service outcomes and review findings
- Convene an ISFRN Service Review meeting

Inputs:

- Proposal
- Information and results from WPs 20, 30 and 40.
- Funding (up to €10,000) for travel and subsistence for invited participants to the ISFRN Service Review meeting.

Tasks:

- Write a Service Roadmap (SOR).
- Consolidate the deliverables in a Technical Data Package (TDP)
- Convene an ISFRN Service Review meeting (REVIEW)
- Allocate, with the approval of the ESA Technical Officer, travel and subsistence funding to invited participants to the ISFRN Service Review meeting
- Produce proceedings of the ISFRN Service Review meeting (PROC)
- Produce a Final Report (FR).

Outputs:

- ISFRN Service Review meeting (D-130)
- ISFRN Service Review meeting proceedings (D-140)
- Scientific Roadmap (D-150)
- Final Report (D-160)
- Technical Data Package (D-170)