 FSC <i>Development</i>	Minutes of Meeting FIRST Use-case Meeting ESTEC, 17-Apr-2000	Doc. No	FIRST/FSC/MOM/0126
		Issue	Final
		Date	26-Apr-2000
		Page	1

The FIRST use-case meeting was held in ESTEC on 17-Apr-2000 with the purpose of discussing the approach to be followed for capturing user requirements as "use-cases" and to agree the inputs which the ICCs will provide to the FSCDT.

Participants :

J. Brumfitt
 P. Claes
 K. Galloway
 J-J. Mathieu
 J. Riedinger
 P. Roelfsema
 N. Todd
 B. Vandenbussche
 S. Veillat
 E. Wicorrek

Agenda and Welcome (JRR):


- The previously circulated agenda (JRR e-mail dd. 4-Apr-2000) was agreed.
- For the meeting introduction cf. VGs in Attachment 1.

FSCDT Approach to Requirements Workflow and Current Status (JBr):

- cf. VGs in Attachment 2.
- All ICCs were happy with the approach presented.
- Use of FrameMaker presents a problem for ICCs; cf. discussion below.
- Glossary will be agreed between all parties (as will the UCM and supplementary specification).

Scope of work for FSCDT and ICCs (JJM):

- cf. VGs in Attachment 3.
- ICCs: During all phases RTA interacts with FINDAS at the level of "replay"; RTA output to FINDAS will be produced during ILTs/ISTs but probably not (at least not routinely) during operations (where RTA is not permanently manned and where MOC is in the loop and creates summaries of instrument health reports).
- The following, additional ICC actors were tentatively identified (TBC):
 - "Test Controller",
 - "ICC Manager",
 - "Configuration Controller"
 - "Software Maintenance",
 - "Calibration Uplink System".
- If a subsystem changes scope (e.g. is provided by the ICCs but then becomes an integral part of the FSC System, such as instrument command generation in the CUS), does such a subsystem become an actor ?

 FSC <i>Development</i>	Minutes of Meeting FIRST Use-case Meeting ESTEC, 17-Apr-2000	Doc. No	FIRST/FSC/MOM/0126
		Issue	Final
		Date	26-Apr-2000
		Page	2

Although this issue was not finally resolved, it was felt that use-cases should **always** start with a human (not a system) as primary actor; this appears to be the correct level to describe use cases for a system (Scientific Ground Segment) which we (FSC, ICCs) develop together and this would preclude a delivered subsystem from becoming a primary actor.

- Common work and agreement on the Glossary is absolutely essential (cf. below).


Organisation (JRR):

- cf. VGs in Attachment 4.
- The following were agreed to be the next steps:
 - BV will set up an e-mail exploder based on each center's list of people who should be included in the ongoing discussion on ICC actors/use cases; each team to notify BV by 18-Apr-2000 who should be on this list (completed; cf. BV e-mail dd. 25-Apr-2000).
 - FSCDT will circulate to ICCs templates for actor and for use-case descriptions in either plain text of ASCII format (completed; cf. JRR e-mail dd. 25-Apr-2000).
 - Each ICC will provide its own first cut at a list of ICC actors and their top level use-cases by 25 Apr 2000, which will lead to an exchange of e-mails via the above exploder during wk 18.
 - This e-mail exchange should culminate in a telecon on May 2, 14:30, organised by SRON. The telecon should result in agreement on ICC actors, their top level use cases, allocation of work on use-cases to different ICC team members, and a plan on how timely progress of the work on use-cases, glossary, and supplementary specification will be achieved/monitored between beginning and end of May.
 - ICC actors and use cases will be formally distributed on 29-May-2000 as one of the inputs for the workshop to be held on 5/6-Jun-2000 at ESTEC. Following initial consolidation of actor descriptions/use cases at this workshop, this "book" will be made available for review to internal and external "users".
- FrameMaker is not available to ICCs and HIFI have agreed on consortium-wide use of MS-Word for all official documentation (which is the ESTEC Project Team standard agreed two years ago). A diversity of document preparation tools will pose a problem in the future when it comes to documents that are jointly produced/contributed to by more than one party.

Action 170400/1: FSCDT to propose a structural solution to the long-term problem of using different tools in FSC/ICCs to produce and maintain joint documentation; due end May 2000.

The ad-hoc solution for the use-case model is to assign custodianship for this document to the FSCDT; FSCDT will specify how the ICC contribution to this book should be delivered to cause minimum work of including this input in the "book".

- The Glossary (of which Drafts 0.5 and 0.6 have already been put on the DMS) is still under FSCDT-internal review. Draft 0.7 will be put on the DMS on 20-Apr-2000 and should form a sufficiently stable basis against which comments should be produced by the ICCs (completed, cf. JRR e-mail dd. 20-Apr-2000).
- The latest draft (Draft 0.2) of the FSCDT-generated actor and use case descriptions is available to the ICCs (distributed on paper by JBr during the meeting; JJM's contribution had already been e-mailed to the participants of the meeting). Draft 0.3 of these actor and use case descriptions and an

 FSC <i>Development</i>	Minutes of Meeting FIRST Use-case Meeting ESTEC, 17-Apr-2000	Doc. No	FIRST/FSC/MOM/0126
		Issue	Final
		Date	26-Apr-2000
		Page	3

example for a supplementary specification will be circulated by the FSCDT around the end of the first week in May, most likely via the FSCDT-internal web pages.

JRR
 26-Apr-2000



FSC
Development

Minutes of Meeting
FIRST Use-case Meeting
ESTEC, 17-Apr-2000

Doc. No	FIRST/FSC/MOM/0126
Issue	Final
Date	26-Apr-2000
Page	4

Appendix 1

Viewgraphs presented by JRR



FIRST Use-case Meeting: Proposed Agenda

- 10.30 Introduction and agreement of agenda (JR)**
- 10.40 FSCDT approach to requirements workflow + current status (JB)**
Overall approach, examples of actors and use-case definitions, progress on FSC actors and use-cases
- 12.00 Lunch**
- 13.00 Scope of work for FSCDT and ICCs (JJM)**
FSCDT's preliminary view of ICC actors and use-cases, Discussion/agreement on ICCs inputs to FSC system use-cases
- 14.30 Organisation (JR)**
Discussion/agreement on Workshop objectives + schedule, Discussion/agreement on FSCDT & ICC inputs to workshop, discussion/agreement on collaboration before the workshop (e.g. emails, teleconferences, contact points, ...)
- 16.20 AOB**
- 16.30 End of meeting**



FIRST Use-case Meeting: Objectives

- Agree course of action over the next few weeks: **Who** does **What** by **When** located **Where** in **Consultation with whom** ?
- To get ICCs started on making their contribution, they need to know what the FSCDT has done so far, why we are doing it this way, and what the result of this exercise should be.



ASTROPHYSICS



FSC Development



FIRST Use-case Meeting: FSCDT Schedule

- Mid-May: Workshop
- End-May: Use cases for review and discussion with PST
- During June: Discuss & consolidate with users
- End-June: Issues 1.0 of use case model (“happy day” flow) plus glossary plus Supplementary Specification plus top-level COM



FSC
Development

Minutes of Meeting
FIRST Use-case Meeting
ESTEC, 17-Apr-2000

Doc. No	FIRST/FSC/MOM/0126
Issue	Final
Date	26-Apr-2000
Page	5

Appendix 2

Viewgraphs presented by JBr

FSCDT Requirements Approach using use-cases

Jon Brumfitt

FIRST Use-Case Meeting, ESTEC, 17-03-2000

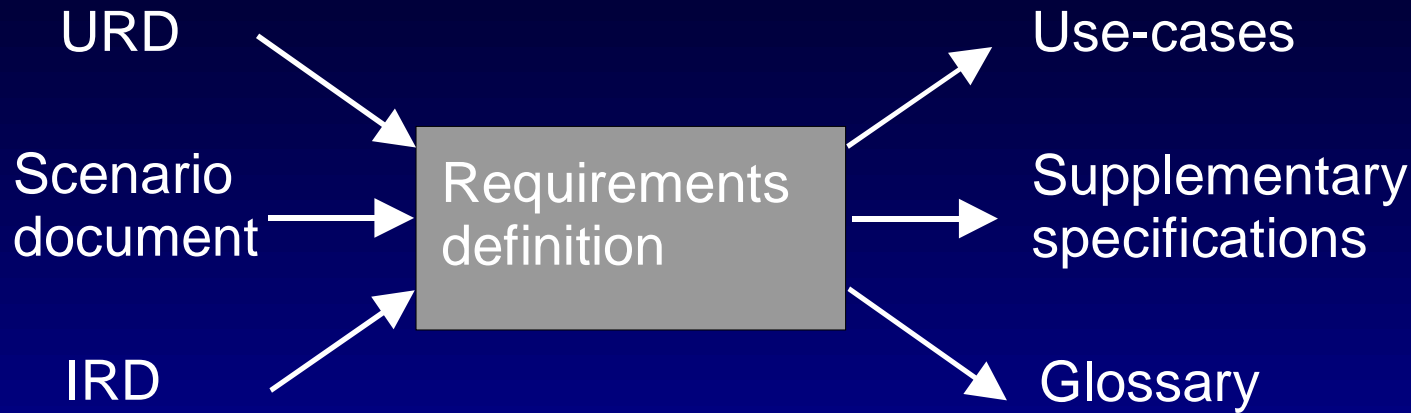


Overview

- what we are trying to achieve
- the approach we are using
 - a quick introduction to use-cases
 - how do we identify use-cases?
 - what is an appropriate level for a use-case?
 - examples of actors and use-cases
- progress so far



Requirements definition



- Identify scope of system
- Identify stakeholders and their interests
- Identify actors and their goals
- Identify use-cases



Actors and use cases

Actors are user roles

- They may be people or external systems

Use-cases describe functional requirements

- how an actor uses the system to achieve a goal



Create a draft schedule (the goal)

Actors: Mission Planner (MP) - primary
Project Scientist (PS) - secondary

Main success scenario:

- 1 MP: selects a planning period
- 2 SYS: creates draft schedule with relevant constraints
- 3 MP: edits schedule: add/move/delete observations
- 4 SYS: generates statistics on schedule
- 5 MP: accepts draft schedule
- 6 SYS: saves draft schedule and notifies PS

Extensions:

- 1a Planning skeleton not available:
MP aborts and tries later
- 2-5a MP prints a schedule summary



Create a draft schedule (2)

Main success scenario:

- 1 MP: selects a planning period
 - 2 SYS: creates draft schedule with relevant constraints
 - 3 MP: edits schedule: add/move/delete observations
 - 4 SYS: generates statistics on schedule
 - 5 MP: accepts draft schedule
 - 6 SYS: saves draft schedule and notifies PS
- Use-cases describe sequences of interactions between various entities (people and systems)
 - The 'ball' passes back and forwards between actor and system and possibly a secondary actor



Create a draft schedule (3)

Main success scenario:

- 1 MP: selects a planning period
- 2 SYS: creates draft schedule with relevant constraints
- 3 MP: edits schedule: add/move/delete observations
- 4 SYS: generates statistics on schedule
- 5 MP: accepts draft schedule
- 6 SYS: saves draft schedule and notifies PS

- Use-cases describes *how* the system is *used* to achieve goal
- The functionality is described in context
- The level of abstraction avoids the implementation and user interface



Extensions

Main success scenario:

- 1 MP: selects a planning period
- 2 SYS: creates draft schedule with relevant constraints
- 3 MP: edits schedule: add/move/delete observations
- 4 SYS: generates statistics on schedule
- 5 MP: accepts draft schedule
- 6 SYS: saves draft schedule and notifies PS

Extensions:

- 1a Planning skeleton not available:
MP aborts and tries later
- 2-5a MP prints a schedule summary

There is a main scenario + extensions which describe

- alternatives: variations on the main scenario
- exceptions: what can go wrong and how to recover



Pre and post-conditions

A contract between use-case and actor:

"If you satisfy my pre's, I will satisfy my post's."

Preconditions:

- conditions required before the use-case can be used
- e.g. user is registered, logged on

Minimal postconditions:

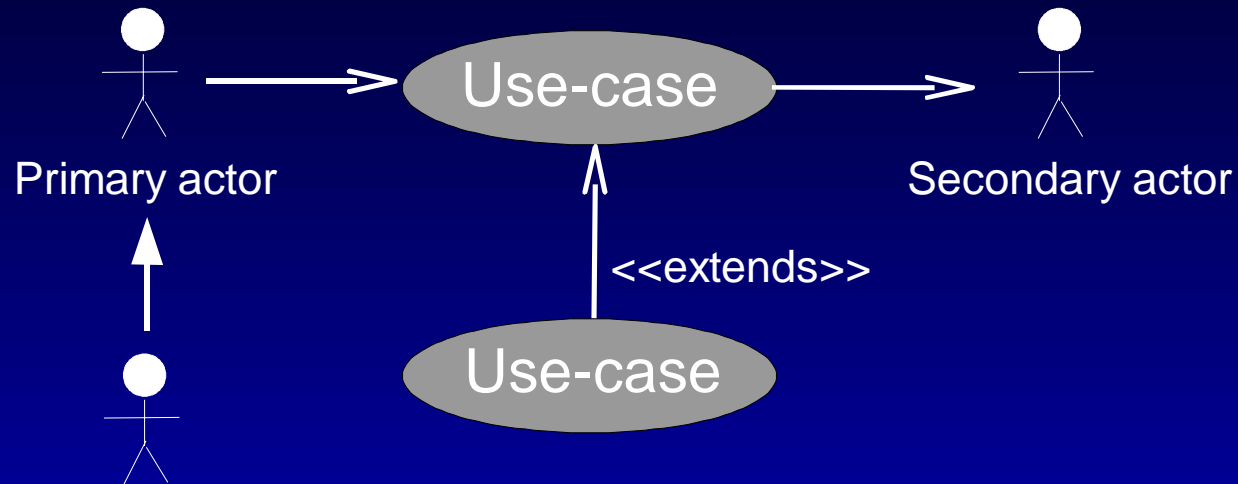
- conditions guaranteed even on failure
- e.g. data consistency, logging of errors

Success postconditions:

- conditions guaranteed on successful completion
- e.g. satisfies goal + interests of stakeholders



UML use-case diagrams



- Use-case diagrams gives a high-level overview
- The important part of a use-case is the textual description



Identifying use-cases (1)

Use-cases correspond to the actor's *goals*

The actors are a good starting point for identifying goals

- Talk to the 'real' actor
- Imagine yourself doing their job
- What are their job responsibilities?
- How do they achieve them?
- What services do they provide as a secondary actor?



Actor: Mission Planner

Description

Member of the FSCOT who produces schedules for each OD. A regular user who is an expert in scientific mission planning. Wants good tool support, but ultimately wants to control exactly what goes into a schedule.

Responsibilities

- Produce draft schedule for each OD
- Maximise scientific return
- Provide schedule statistics

Interests

- Schedules satisfy constraints
- Schedules are accepted by MOC



Identifying use-cases (2)

- How does the actor satisfy his responsibilities?
- What are the his/her goals at various levels?
- Which goals are use-cases?
- Look for related goals (via higher-level goal)
- Cross-check against URD etc



Example continued

Goal hierarchy

- Provide schedules throughout mission
 - Run long-range simulation
 - Plan a planning period
 - Create draft schedule
 - Interactively edit schedule
 - Optimise schedule / automatically schedule
 - Generate schedule summary and statistics
 - Obtain approval for schedule
 - Submit schedule to MOC
 - Generate commitable schedule
 - Export schedule to MOC
 - Notify observer
 - Replan submitted schedule
 - ...

User
level



Example continued

Use-case summary

- Run long-range simulation
- Create draft schedule
- Submit schedule to MOC
- Replan submitted schedule

This list of use-cases (user goals) is the desired result

The responsibilities, etc, were just to help us find it



Goal levels

What is an appropriate level for a use-case?

astronomical research

perform an observation

summary level

submit a proposal

user level

create a proposal

log on to system

press a button

implementation level

move mouse

why ?



How ?

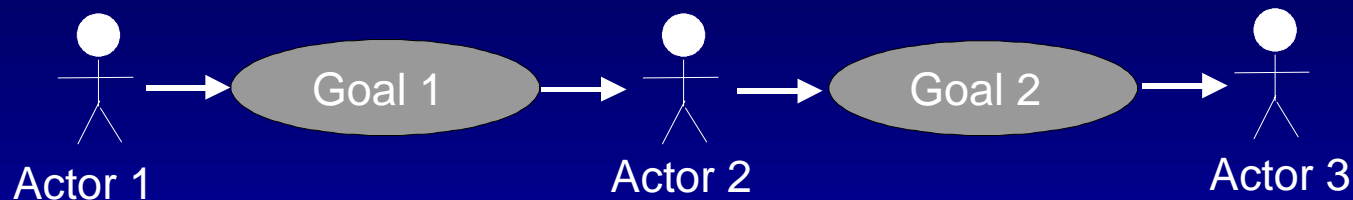
User-level goals are:

- something the user *really* wants to achieve ...
- ... with a short-term result
- not implementation or user interface specific



High-level (summary) use-cases

- provide a context for lower-level use-cases
- show how use-cases combine to solve "business" problems
- can include alternative flows and exceptional flows



Actor1: goal1

Actor2: goal2

Actor3: goal3

- not centered around a single system



Complexity of use-cases

Use-cases may need decomposing:

- if they are too long (> 6 pages)
- to allow implementation in a single iteration

Breaking into manageable chunks for implementation

- implement basic scenario, then add extensions
- these can be extension use-cases
- but, use-cases define requirements, so should not be distorted by work plan
- this decomposition does not matter at the moment

Each release should provide complete (testable) scenarios, not features which cannot be used.



Work breadth-first

- define goals
- tie them together with summary use-cases
- add main scenarios
- add alternative flows
- identify exceptions
- define exception handling/recovery

Don't add detail too early!



What we have done so far

- Initial look at stakeholders and interests
- Scope diagram
- Identified 22 actors and their goals (too many?)
- Identified ~100 use-cases

- Produced FrameMaker templates
- Expanded a few use-cases as examples



Actors for FSCS

General public

Astronomer

Archive user

Proposer

Observer

Configuration controller

FOTAC

ICC (10)

Integration & test team

FSCOT

Mission planner

PST

Helpdesk

Proposal handler

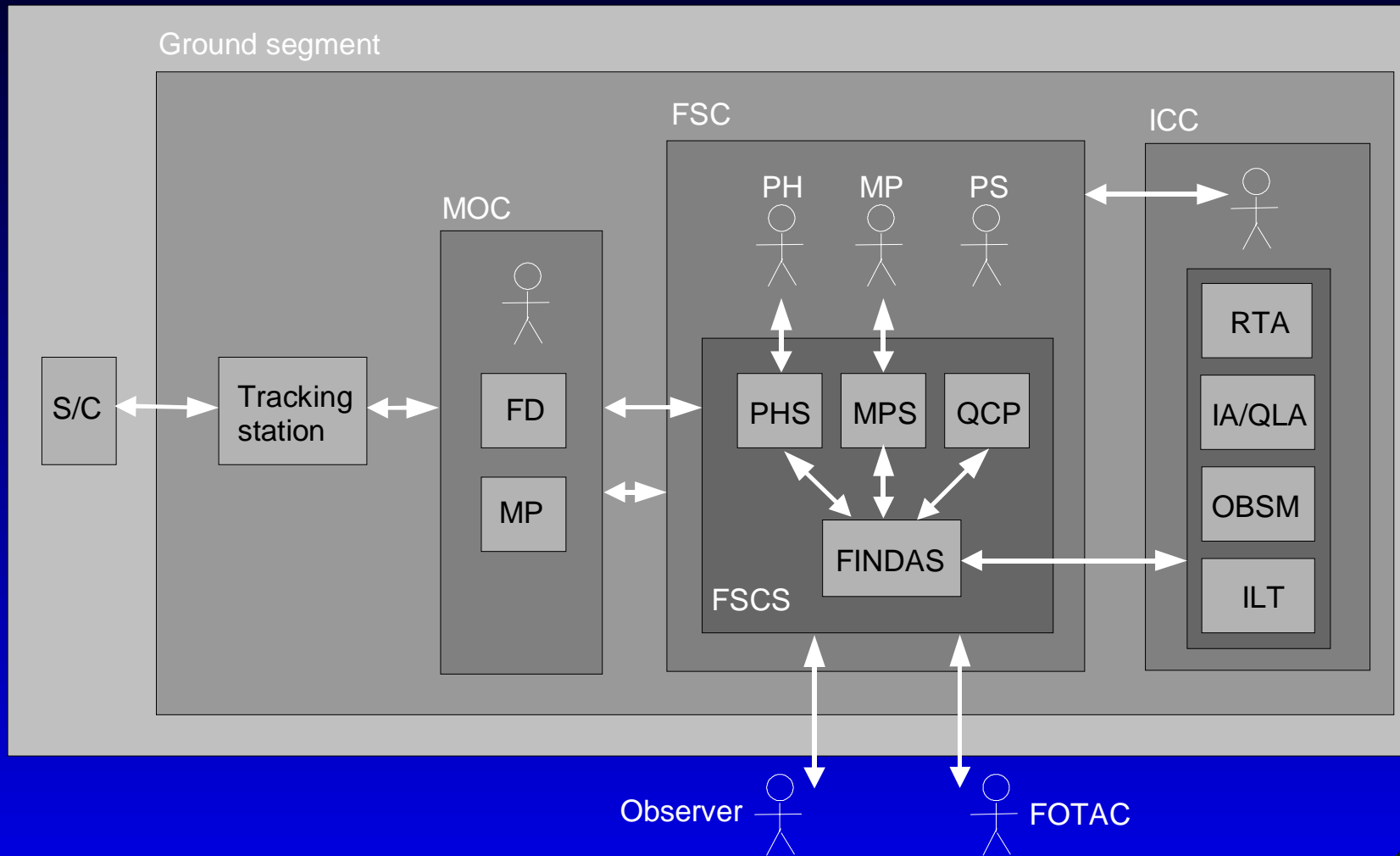
Scientific product analyst

Test coordinator



Design scope

Observatory



Further reading

- Cockburn A,
Writing Effective Use Cases,
pre-publication draft 3, available from:
<http://members.aol.com/acockburn>
- Leffingwell D, Widrig D,
Managing Software Requirements: A Unified Approach,
Addison Wesley, 2000.





FSC
Development

Minutes of Meeting
FIRST Use-case Meeting
ESTEC, 17-Apr-2000

Doc. No	FIRST/FSC/MOM/0126
Issue	Final
Date	26-Apr-2000
Page	6

Appendix 3

Viewgraphs presented by JJM



Presentation summary

- ICC actors
- Use-cases
- Plan



ICC actors

- RTA system
- QLA system
- IA system
- Calibration scientist
- Engineering observation system (Instrument engineer?)
- Onboard Software Maintenance System
- ILT team (ILT system?)
- IST team (IST system?)



ICC use-cases (1)

- RTA system: Create an operational log covering the period of instrument activity
- QLA system: Create a report of science data quality
- QLA system: Create quality information log
- IA system: Configure a pipeline
- IA system: Get science result
- Calibration scientist: Provide a calibration draft schedule to mission planning
- Calibration scientist: Create a calibration observation
- Calibration scientist: Provide observation for mission planning
- Provide calibration data and software changes to FSCS



ICC use-cases (2)

- Engineering observation system: Create an engineering observation
- Engineering observation system: Provide observation to mission planning
- Onboard software maintenance system: Provide instrument memory image to FSCS
- Onboard software maintenance system: Report change and effects
- ILT team: Create a test
- ILT team: Select a test
- ILT team: Link data items



ICC use-cases (3)

- ILT team: Ingest test data
- IST team: Select a test
- IST team: Report analysis test result
- IST team: Ingest test data



Plan

- ICC elaborate the actor-goal list and the use-case description (goals, summary use-case and main scenario)
- End of May draft of summary and user level use-case (main scenario)

⇒ **We can provide some help, we cannot perform this work for you.**

⇒ **We need to keep the schedule or we will not be ready with a common object model in time and thus be late with the ILT delivery.**



FSC
Development

Minutes of Meeting
FIRST Use-case Meeting
ESTEC, 17-Apr-2000

Doc. No	FIRST/FSC/MOM/0126
Issue	Final
Date	26-Apr-2000
Page	7

Appendix 4

Viewgraphs presented by JRR



FIRST Use-case Meeting: Workshop in May (1)

Workshop (“2 days mid-May” agreed at FSCDT kick-off)

- When ? Proposed: week starting 22 May
 - ⇒ maximises time available to write up actor descriptions & use-cases
 - ⇒ latest week not in collision with school holidays
 - ⇒ appears compatible with FSCDT schedule

Should we move this to week of 5 June to allow more time
? If we delay this: do we actually end up with a better
product ? Input has to be available at least 3 WDs in
advance of the meeting...



FIRST Use-case Meeting: Workshop in May (2)

- Participants ? Proposed: All actively involved in the effort plus a PST representative
- Where ? Proposed: If outside ESTEC, ~7 people from FSC need to travel \Rightarrow by train \Rightarrow Groningen or Leuven
- Duration ? Proposed: 2 days appear sufficient *provided* everyone has had (and actually spent) enough time reviewing *all* input.
- What ? Proposed: Review actor descriptions, use-cases (“happy day” scenarios), glossary, supplementary specification \Rightarrow update within a few days \Rightarrow circulate for review & agreement (by whom ??) by end June.



FIRST UC Meeting: Nuts & Bolts Apr/May (1)

- PACS support: E. Wiezzorek, B. Vandenbussche (1 f.t.e ?)
- SPIRE support: S. Sidher ? S. Oliver ? (1 f.t.e ?)
- HIFI support: **NOT** P. Roelfsema !? (1 f.t.e. ?)
- FSCDT: ~ 3 f.t.e (from JJM, PC, JBr, SV, KG, JRR)
- Use of FrameMaker ? Templates agreed ?
- FSCDT point of contact for ICC actors/UCs: JJM
- FSCDT point of contact for templates: JBr
- FSCDT point of contact for glossary: KG
- Responsibility for and contributions to “supplementary specification” ?
- **Where does this leave the COM ???**



FIRST UC Meeting: Nuts & Bolts Apr/May (2)

FSCDT experience so far (in a nutshell)

- Everything takes longer than you thought, especially if you need rounds of consolidation (which the ICC input will definitely require) between drafts ! 1 f.t.e per ICC is not too much...
- Although you can go quite a long way using your own expertise, this expertise will run out sooner than you think ⇒ you **absolutely** have to talk to your colleagues involved in instrument design and operations to at least be able to identify open points (e.g. Can the instrument be operated while you are uplinking a memory image ?)!