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M E E T I N G

meeting date *date de la réunion*	19-20/04/00	ref./*réf.*	FIRST/FSC/MOM/0129	page/*page*	1 26
meeting place *lieu de la réunion*	ESOC		chairman *président*		
minute's date *dates de minute*	08/05/00		participants *participants*		
subject/objet			copy/*copie*		

description/description	action/action	due date/date limite

O b j e c t i v e & A g e n d a

See SV's VG#1

There were no comments on the proposed agenda

There were no comments on the FGSSE#4 MoM.

I R D r e v i e w (d r a f t 0 . 5 d a t e d 0 7 / 0 4 / 0 0):

There were no comments from ICCs. ESOC had one question: SV clarified to ESOC (NP) that the 10 minutes performance requirement (in 3.1.1.3.1) on MOC for making available consolidated TM is only meant to cover the consolidation process not the delivery of TM to the FSC. With this clarification, NP agrees to the requirement, in fact NP believes the consolidation process should take less than 10 minutes. The clarification will be added to the IRD.

Explanatory text will be added to the IRD to reflect both this meeting discussion on the downlink system design and the CUS (see below), respectively:
- the delivery of NRT TM to the ICC@ICC will be done via the ICC@MOC (IRD 3.2.2)
- the instrument commanding request interface between the FSC and the MOC will be done at the level of TC mnemonics, with a one to one relationship between a TC mnemonic and a TC packet (TBC).

It was agreed that with the above additions, the IRD v0.5 will be updated to IRD v1.0.

F I N D A S r e l a t e d d i s c u s s i o n s

As agreed at the managerial teleconf on the 10/04, the group screened the FINDAS URD (draft 0.6) for any requirements relevant to the FSC System URD (draft 0.4).
The screning was based on the inputs (pre-screening) from EW (see appendices). EW's inputs are also reported below in *italics*.

1. *FINDAS shall archive data, software and documents.* FGSSE: Requirement agreed but no need for new requirement. The FSC UR 3.1.5.1.1. covers it partially. The latter shall however explicitly mention software and documents. It was also agreed to add a requirement explicilty requiring for logical links between data, software and documents in the FSC System. PR took an action to formulate the requirements.

⇨ **AI#200400/1: PR to formulate the requirement on the FSC System to capture the need to have links between data, software and documents in the FSC System . Due date: 30/04/00.**

2. *FINDAS shall be an object oriented database system (to allow implementation of the common data model).* FGSSE: Not agreed, implementation related. The underlying user requirement is expected to be covered by the requirement resulting from above action, AI#200400/1

3. *FINDAS shall allow to distribute data and software modules between the different parties involved with the FIRST mission.* FGSSE: see 8.

4. *FINDAS shall support the communication (e.g. SPR handling system, mailing lists) between the different parties involved with the FIRST mission.* FGSSE: see 8.

5. *FINDAS shall be a distributed archive system with the central node located at FSC and satellite nodes located at the ICCs and MOC.* FGSSE: see 8.

6. *Satellite nodes shall have the same view on the same data as the central node.* FGSSE: see 8.

7. *Objects ingested at a satellite node shall be automatically forwarded to the central node.* FGSSE: see 8.

8. *It shall be possible to load objects ingested by a satellite node during off-line mode to the central node.* FGSSE: requirements 3, 4, 5, 6, 7 & 8 can be grouped under the following high level requirement: " The FSC System shall support decentralised operation". This requirement shall be completed with the explanatory text of the FINDAS UR-S1 p 17.

9. *FINDAS shall support distributed development.* FGSSE: agreed: " The FSC System shall support distributed SW development". SV stressed that this does not mean that the FSC System will provide a full fledge SW development environment, it is expected that the level of support is limited e.g. CM, SW

test areas (sand boxes). An explanatory text is to be added to this requirement to clarify the expected level of support. RH agreed to take an action to provide this text.

⇨ **AI#200400/2 RH to provide explanatory text to complete the FSC System requirement " The FSC System shall support distributed SW development". Due date 30/04/00.**

10. FINDAS shall supply multiple "sand-boxes" for different users or user groups to develop and test new modules or to maintain and test existing modules without to influence the main FINDAS system. FGSSE: Covered by 9.

11. FINDAS shall specify a "unified" development and test environment for FINDAS developers. This include the specification of hardware, operating system and software tools. FGSSE: Not agreed. This is not a requirement on the FSC System but rather a SPMP issue.

12. FINDAS shall be available continuously around the clock, 7 days on 7, with only minor interruptions for maintenance. FINDAS shall be unavailable for no more the 3 hours on average in any period of 7 days, and no period of unavailability shall exceed 24 hours. FGSSE: Covered by FSC-UR-3.2.4.x. Actual availability figures needs to be justified by the FSC and ICC SIPs.

13. FINDAS shall be able to store 6 Tbytes of FINDAS data and 6 Tbyte of Planck data. FGSSE: agreed (FIRST only, Planck is outside the scope of the FSC System URD): "The FSC System shall be able to store 6 Tbytes (TBC) of data". An explanatory text shall be added to remind that the size of the storage area shall be extendible to cater for PLANCK needs later on.

14. Access to FINDAS (query, data retrieval, data ingestion) shall be access controlled. Every user shall be at least in one user group. Every user group can implement one or more user roles. FGSSE: covered by FSC UR 3.2.2.0.x.

15. Objects with FINDAS shall be allowed to have different versions. Every version of an object shall accessible. FGSSE: The requirement is in principle agreed but its wording is too implementation related. The FGSSE agreed on the following wording: "The FSC System shall support the management of multiple versions of the FIRST data". Explanatory text will added to precise that it in particular means that old versions of FIRST data can be retrieved. Note that this requirement includes existing FSC UR 3.1.2.5.4.

16. External data sources shall be visible within FINDAS by using internal classes/objects as interfaces. FGSSE: Not agreed, implementation relateded, reworded to: "It shall be possible to access external data and tools through the FSC System standard interface". This requirement would overwite the current FSC UR 3.1.2.1.4.

17. FINDAS shall be designed in a way that open standard industry interfaces are available, e.g. ODMG, RMI, CORBA. FGSSE: covered by 21

18. FINDAS shall be designed in way that it is easily extendible. FGSSE: covered by 20.

19. Different versions of FINDAS must be downward compatible. FGSSE: covered by 20.

20. *FINDAS shall support a seamless transmission between mission phases.* FGSSE: reworded to "The FSC System shall support smooth transition between mission phases". Explanatory text will be added to precise the requirement, i.e. that:
    - the FSC System shall be designed to support the retrieval and processing of data ingested in a previous phase of the mission (e.g. retrieval and processing of ILT data during the routine phase).
    - the FSC System shall be designed to maximize re-use of tools in the different phases of the mission.

21. FINDAS shall support an server/client concept to allow the implementation of simple clients. FGSSE: reworded to: "It shall be possible to interface additional clients to the FSC System through a standard API".

22. FINDAS shall be able to display following document formats: HTML, XML, ASCII, PDF, PS. FGSSE: Not agreed. it was clarified that this requirement was not an FSC System requirement. The documents will be viewed through external tools.

23. FINDAS shall be to ingest and browse the above document formats. FGSSE: Covered by 1. Not directely related to this requirement but as a follow-up of the discussion on documentation browsing, it was agreed that the FSC System should support queries on document and specific data content (e.g. on a value of dark current). To capture this point, it was agreed that the following bullets should be added to UR-3.1.5.1.6: "search on document content" and " search on data content (e.g. value of dark current)". It was also proposed that the bullets of UR-3.1.5.1.6 should be turned into explanatory text vs. requirement as they are only examples of queries. The exact range of possible queries should be captured in use cases.

24. FINDAS shall support bulk data delivery via network and storage media like CD, DVD, DAT. FGSSE: agreed except for the reference to network and storage media that is implementation related: "The FSC System shall support bulk data delivery".

25. FINDAS shall provide facilities to ingest and distribute satellite telemetry in real-time. FGSSE: The performance aspects related to the distribution of data across the different nodes of the FIRST GS is already covered by the IRD. It remains to cover the performance aspect related to ingestion/retrieval of data within a single node. This is proposed to be covered by the three following requirements:

" The FSC System shall be able to ingest TM data at a rate higher than the on-board TM data generation's" *This is needed in any case for the FSC System to avoid building back-log of TM data.*

"The FSC System shall be able to retrieve TM data at a rate N (TBD) times higher than the on-board TM data generation's"
This requirement is to be understood in the context of TM replay.
This requirement was already discussed/agreed at the managerial teleconf on 10/04/00

"The FSC System shall not generate at a local node more than a one minute delay between the ingestion and the retrieval of TM data"
This requirement is to be understood in the context of monitoring NRT TM data by the ICC, at either ICC@MOC or ICC@ICC. Considering IRD performance requirements, it means that ICCs at ICC@MOC will be able to retrieve TM from FINDAS within two minutes from reception of the TM at MOC.

26. *FINDAS provide a processing environment to run queries, to run FINDAS servers and other tools like SPG.* FGSSE: Too low level, covered by UR-3.1.5.1.6.

27. *FINDAS shall provide load-regulating mechanisms and connection management.* FGSSE: too low level, covered by 8.

It was recalled by SV, that the above proposal is subject to final agreement with the FIRST project scientist (GP) before inclusion into the FSC System URD v1.0.

SV then triggered a discussion on the formal role of the FINDAS URD. SV recalled that for the FSCDT, (see SV's VG#7), FINDAS would be specified as part of the FSC System analysis and design activities, leading to a FINDAS TS which will be a collection of use cases and analysis and design classes. This was agreed by all, leading to consider the FINDAS URD as a reference document vs. an applicable one to the FSC System development. With this understanding, it was agreed that there was no point in discussing the screening of the FINDAS URD for ILT.

It was also pointed that the FINDAS URD included a number of requirements which were in fact directly applicable to the COTS OODBMS and that the URD could be used as a prime input to an FSC/ICC consolidated list of features to be supported by the COTS DBMS.
As part oh the FINDAS URD screening exercise, EW had already listed the FINDAS URD requirements he found applicable to the COTS DBMS. It was decided to carry over this activity and to come up with a consolidated list of features that the DBMS should support. This list will be used as a checklist to support the final selection of the DBMS. Apart from the FINDSA URD, other sources should be used, CERN studies were mentioned by PR.

=> AI#200400/3: FSC and ICCs representatives to compile the list of features to be supported by the COTS DBMS in time for next meeting. Due date: 26/05.

System interfaces Design discussion (downlink)

The discussion addressed the particular issue of the distribution of TM to ICC@ICC during commissioning and instrument emergencies. For this period, the FSC cannot meet the ICC requirements to have TM delivered to ICC@ICC within 20 minutes after reception of the TM by MOC (IRD 3.2.2) by retrieving consolidated TM from MOC, see SV's VG#3

SV had listed a number of design options, which could potentially meet the requirements, see SV's VG#4-6. Before the discussion on options could took place, ICCs proposed to be in charge of the TM distribution, including communication line, to the ICC@ICC when NRT distribution is needed. This solution is also the ESA's preferred solution. It was agreed by ESA, ESOC (NP&JD) and project (PE), that MOC will give the necessary support on the ICC@MOC when ESOC infrastructure (e.g. routers) needs to be involved. This solution is still to be approved by ICCs management.

This solution is believed (by ICCs and ESOC) to be appropriate not only for the commissioning phase but also for the emergency cases as the comms lines between ICC@MOC and ICC@ICC could be established on demand without any prior warning to the comms provider (i.e. in the same way as a phone call).

The TM received by ICC@ICC in NRT would obviously be non-consolidated TM. They will be ingested in ICC@ICC in FINDAS in a database separate from the one including the consolidated TM. PACS expects that FINDAS will allow to automatically switch from non-consolidated TM to consolidated TM when the latter are made available by the FSC, see EW's VG #1. SV points that the automatic switch should be supported by the DBMS, for it to be implemented.

In this context, ESOC (NP) confirmed (what he presented at the Garching meeting on the 28/03) that MOC will distribute TM to ICC@MOC as a stream of TM using the TCP/IP protocol and not through a file based protocol.

During commissioning, it was clarified that the FSC should make available consolidated TM to ICC@ICC with the same performance as during the PV phase, i.e. within 2 hours after MOC reception of the TM.

SV and PE raised the issue of the need for a full fledge ICC set-up at MOC: ICC@ICC receiving TM in NRT, QLA and IA could not be needed at MOC. This would allow to simplify the ICC@MOC set-up (no QLA, IA and FINDAS node) and consequently the FSC- ICC@MOC interface and associated FSC operation. All ICCs representatives strongly disagreed with not having QLA/IA at MOC and argued that the simplification would not be significant anyway (ICC@MOC is only one additional FINDAS node). ESOC (JD) is also in favour of having a full fledge ICC@MOC set-up to guarantee that the ICCs can answer any MOC request within minutes during these phases. A full fledge ICC@MOC set-up (including RTA, QLA/IA and a FINDAS should therefore be considered the baseline.

As part of the above discussion, PR mentioned that he expected that the FSC would be able to manage more than one ICC@ICC FINDAS sites per ICC. PE and SV clearly stated that from an operation standpoint, the FSC will only interface with one ICC@ICC site per ICC, the reference one. The other ICC@ICC sites will interface with this reference site (one per ICC) and not directly with the FSC.

However, the FSC System (not to be mixed-up with the FSC, operational center) will support operation distributed on multiple sites (FSC, ICC@ICCs and ICC@MOC).

System interfaces Design discussion (uplink)

RH presented the CUS concept (see, RH's VGs). This presentation encompasses the partial presentation made at the FGSSE#4 meeting.

The CUS concept presents four level of abstraction to define an observation, see RH's VG#2:
- observation (AOT and non AOT)
- functional unit (equivalent to measurement) and/or S/C pointing requests
- instrument service request or (atomic) instrument command (IC)
- instrument TC mnemonic

The term TC mnemonic was preferred to the term telecommand, which was proposed by RH. The telecommand is understood by MOC as telecommand packet.

Service requests are requests to the instruments, they correspond to the procedures, functions concepts introduced at the FGSSE#4 CUS presentation.
[RH's post meeting comment: Service requests to instruments could also be a PERFORM command which actually executes an atomic instrument command. So a service request can correspond to procedures, functions and also atomic instrument commands. The difference with the branch to the right in my second viewgraph is that functions and procedures will be expanded on the ground. You could also see this as an expanded view on the service request.]

One observation can be translated into a sequence of one to n functional units.
One functional unit can be translated into a sequence of one to n service requests or of one to n ICs
An instrument can be commanded at service request level, i.e. one TC mnemonic will correspond to one service request, or at (atomic) instrument command level, i.e. one TC mnemonic will correspond to one IC.
One service request can be expanded on ground to a sequence of one to n (atomic) ICs.

The interface between the FSC/ICC and MOC in terms of instrument commanding will be at the level of TC mnemonic, one TC mnemonic being translated by MOC into one TC packet. In this respect, it was clarified that the concepts of Activity, Event Designator and TC sequence used in other missions (e.g. XMM) is not relevant for the FIRST instruments commanding.
The translation by MOC of TC mnemonics into TC packets will be done thanks to the instrument databases, which will include e.g. the corresponding APID, PUS type, sub-type, default parameters corresponding to a given instrument TC mnemonic.

The on-board execution of a service request may involve some control flow but will be deterministic (e.g. known finite loop), i.e. the duration of its execution can be exactly calculated on ground. This answers the concern raised at the FGSSE#4 meeting wrt control flow in procedures, see FGSSE#4 MOM.

The decision to expand or not on ground (in the FSC) an instrument service request into (atomic) instrument commands shall be part of the observation definition.

The commanding of an instrument at the IC level raises the issue of the limitation on the number of commands, which can be sent to an instrument by the CDMS within one second. Depending on this limitation one may need to be able to group, at MOC, TC mnemonics within one TC packet (EW). PE mentions 10 commands as the order of magnitude. PE accepted an action to confirm or otherwise this number. The exact number cannot be known before studies on the CDMS performance and the bus profile is carried out in phase B.

⇨ **AI#200400/4: PE to provide the order of magnitude of the number of commands that could be sent to an instrument by the CDMS within one second. Due date 30/05/00.**

The CUS concept presented by RH still needs to be validated/consolidated wrt the instrument commanding concept, which is currently captured in the joint technical note by K.J.King "FIRST Instrument Commanding Concepts", draft 1, 22/10/99. ICC expects to be able to do this validation/consolidation work as part of the instrument on-board SW meeting planned in Roma on May 15. An action was taken by Rik to draft a technical note detailing the CUS concept including any changes resulting from the Roma meeting.

=> AI#200400/5: RH to draft a CUS technical note in time for discussion at the next FGSSE meeting. Due date: 26/05/00 (i.e. in time for FGSSE group to read it before next meeting).

Wrt to the interface between the CUS and the FSC System, it was agreed by FSC and ICC that the CUS should not be considered as a stand-alone subsystem. The CUS will be part of the FSC/ICC class model and will be defined and designed as part of the definition of this model.

In this respect, it was discussed that observations could need to be captured in the class model at the level of both observation and sequence of functional units, the former capturing the source definition of the observation, the latter being needed to relate telemetry with measurements.
SV pointed out that the MPS should have a unified view of an observation, independent from it being AOT based or non-AOT based. This should be the case if all observations can be seen as a sequence of functional units.

Review of actions

Past actions:
Only one action was left open from last FGSSE meetings: AI#260100/1: ICCs to generate the FINDAS ILT URD and present it to the FGSSE group.

This action was performed/closed with inputs from HIFI (PR) and PACS (EW), see appendix.

New actions:
Five new actions were open at this meeting:

- **AI#200400/1: PR to formulate the requirement on the FSC System to capture the need to have links between data, software and documents in the FSC System. Due date: 30/04/00.**

- **AI#200400/2 RH to provide explanatory text to complete the FSC System requirement " The FSC System shall support distributed SW development". Due date 30/04/00.**

- **AI#200400/3: FSC and ICCs representatives to compile the list of features to be supported by the DBMS in time for next meeting. Due date: 26/05.**

- **AI#200400/4: PE to provide the order of magnitude of the number of commands, which could be sent to an instrument by the CDMS within one second. Due date 30/05/00.**

- **AI#200400/5: RH to draft a CUS technical note in time for discussion at the next FGSSE meeting. Due date: 26/05/00 (i.e. in time for FGSSE group to read it before next meeting).**

A O B & N e x t M e e t i n g

Next meeting FGGSE will be in RAL on the 30-31 of May 2000. SS will send practical details on how to get there and on hotels.

A t t e n d e e s:

John Dodsworth (ESA – ESOC) (partial)
Pierre Estaria (ESA - FIRST/PLANCK project) (partial)
Rik Huygen (KUL)
Nestor Peccia (ESA-ESOC) (partial)
Peter Roelfsema (SRON)
Sunil Sidher (RAL)
Stephane Veillat (ESA – FSC)
Erich Wiezorrek (MPE)

C c :

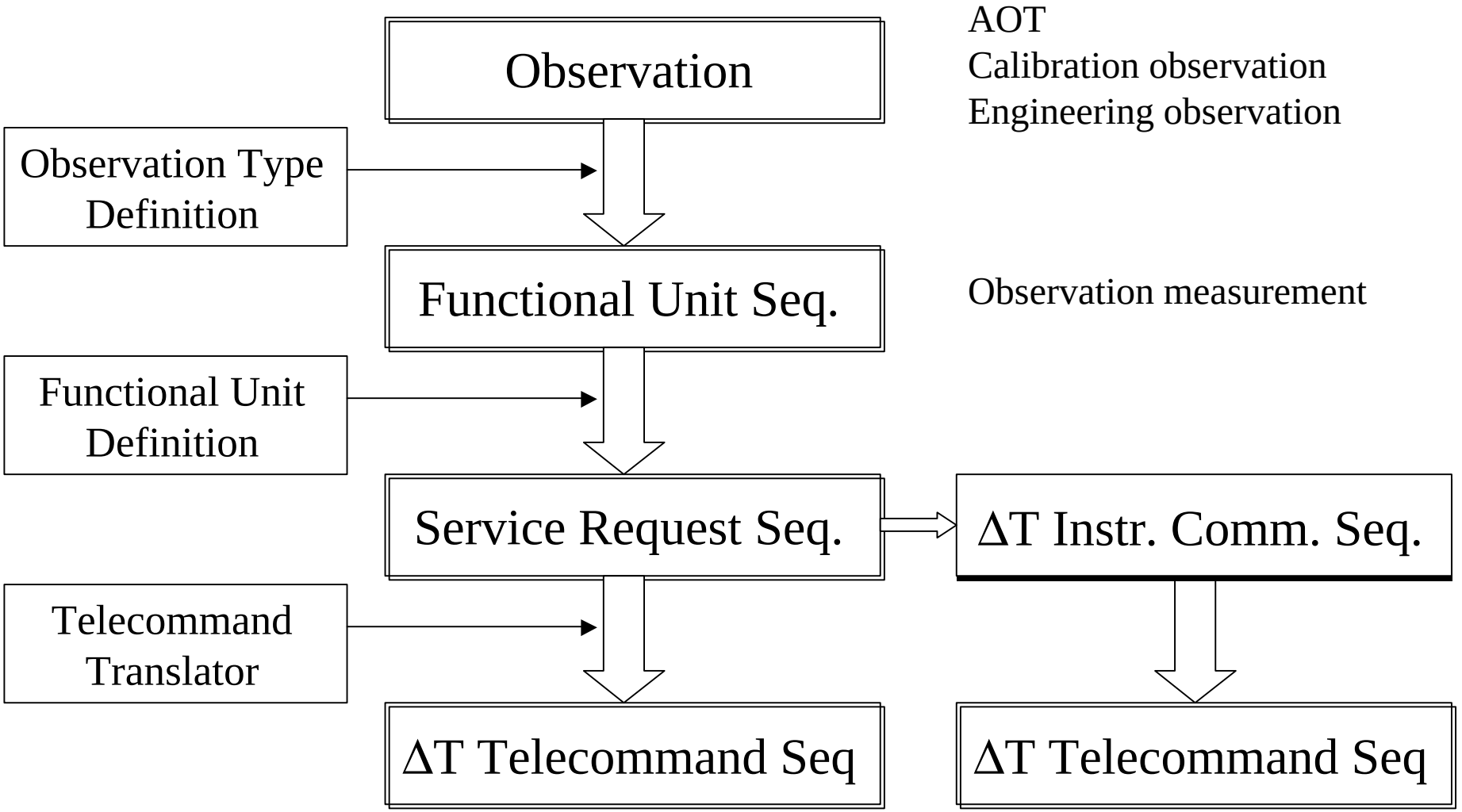
O. Bauer (MPE)
J. Brumfit (Aurora – FSC)
P. Claes (ESA – FSC)
T.G. Dimbylow (RAL)
K. Galloway (Aurora – FSC)
A. Heras (ESA-FSC)
S. Lord (IPAC)
J.J. Mathieu (ESA)
G. Pilbratt (ESA – FSC)
J. Riedinger (ESA - FSC)

R H's V G s: (t o b e a t t a c h e d)

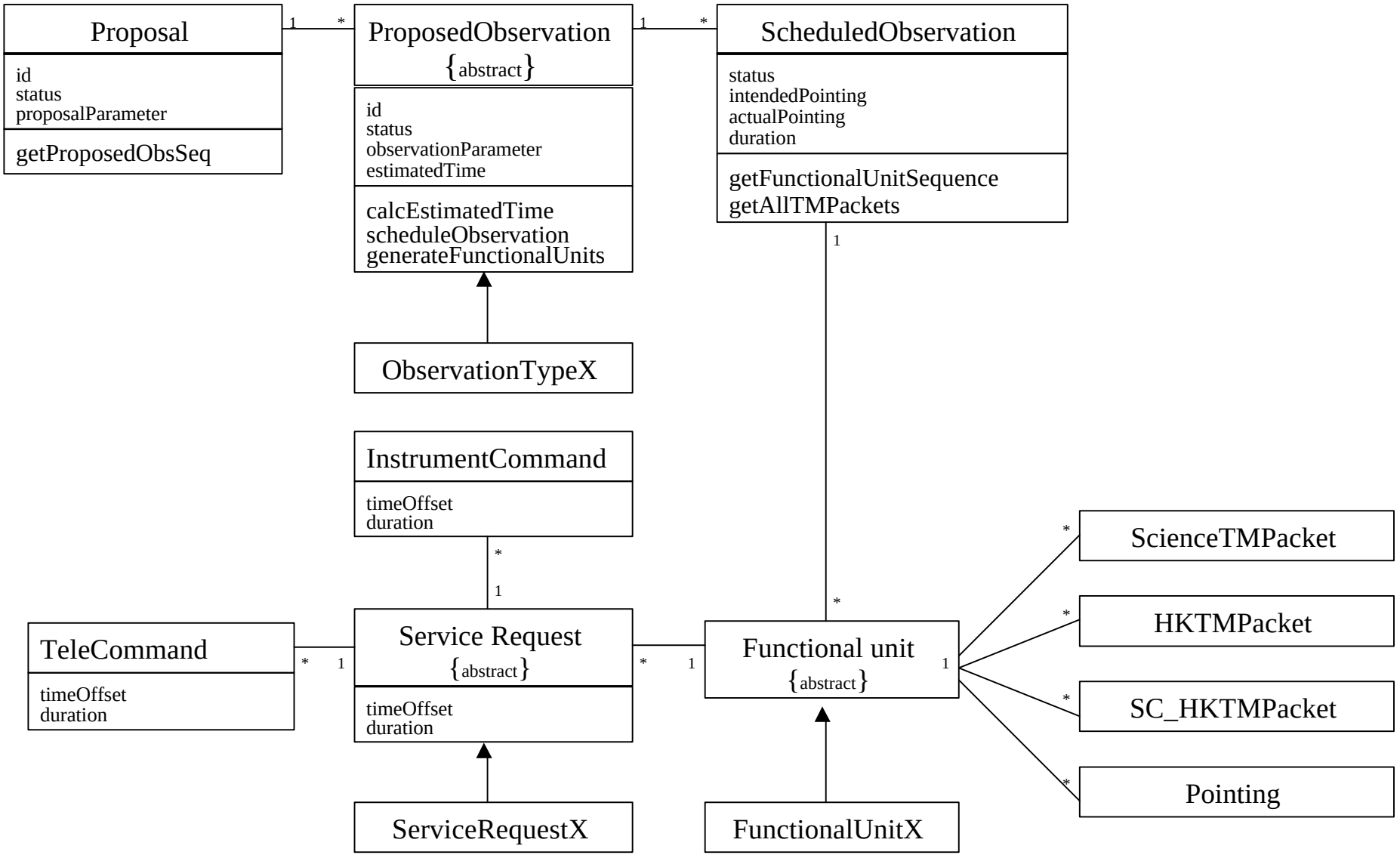
CUS Top Level User Requirements

- CUS shall be used for all type of observations
- CUS shall provide output ready for scheduling
- CUS shall be used through all phases of the project
- CUS shall be fully integrated in the COM
- CUS shall provide the estimated total time of the observation
- CUS shall provide interfaces at all abstraction levels
- CUS shall support functional units
- CUS shall support service requests
- CUS shall support instrument commands
- CUS shall implement a scripting language

CUS Abstraction Levels

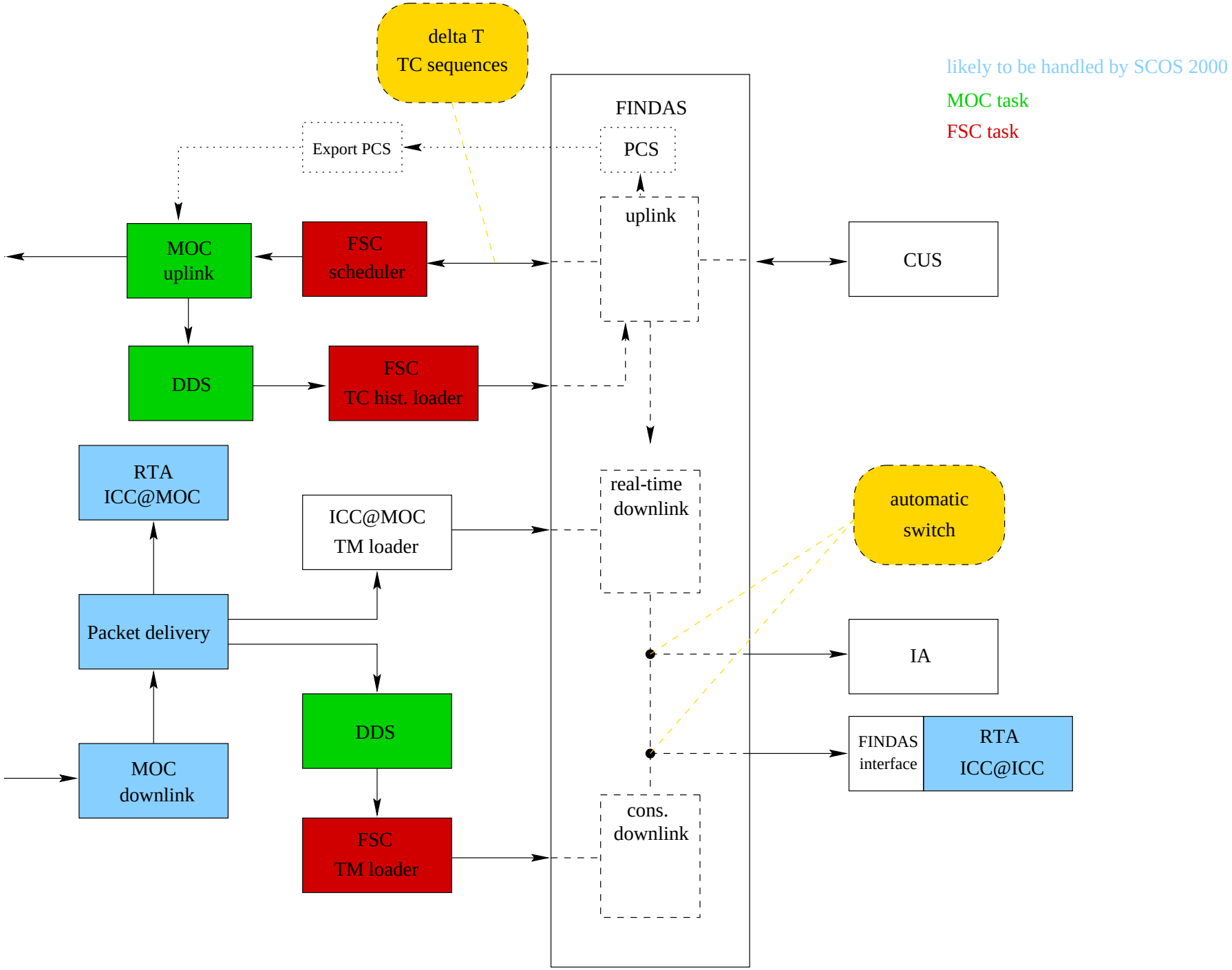


CUS reflected in the COM



E W ' s V G : (t o b e a t t a c h e d)

"EGSE" setup for operations (data flow)



SV's VGs: (to be attached)

Agenda

- **Comments on FGSSE Mtg#4 MoM, FGSSE#5 agenda**
- **IRD v0.5**
  - review of comments on changes introduced after the 28/03 Garching meeting. Following this round of comments, the IRD will be baselined and re-issued as v1.0.
- **FINDAS URD screening and abstraction for FSC System URD and FINDAS ILT URD (~ 2 hours)**
  - as agreed at the teleconf on 10/04, this screening/rewording should lead to the elicitation of the FINDAS related requirement for the FSC System URD and for the selection of the subset of the FINDAS requirements to be met for ILT.
  - Inputs to this exercise are twofold:
    - FINDAS UR screening/abstraction for inclusion into the FSC System URD by PACS (EW)
    - FINDAS UR screening for ILT by HIFI(PR)

    both inputs are to be available before 14/04 (PR input is already available)
- **Uplink System design issue: CUS (1 hour)**
  - "Complete" presentation of the CUS concept by PACS (RH). Discussion on what it means in terms of interfaces between ICCs system, the FSC System and the MOC.
- **Downlink system issue: NRT TM distribution (2 hours)**
  - Follow-up of the discussion initiated in Garching on the 28/03.
  - Presentation of the different options for distribution of NRT TM from MOC to ICCs (SV)
  - Discussion/actions
- **FGSSE actions (status)**
- **Next FGSSE meeting(s)**
- **AOB**
  - **potential discussion on the outcome of the use case meetings (17/03 - ESTEC) and S2K meeting (18&19-03 - ESOC).**

TM distribution to ICCs

Mission phase	ICC performance requirements	Implementation	Comments
Routine	TM available at ICC@ICC **32 hours** after reception by MOC	Consolidated TM received via FSC	
PV	TM available at ICC@ICC **2 hours** after reception by MOC	Consolidated TM received via FSC	
Commissioning **+** **Instrument Emergencies**	TM available at ICC@MOC **1 minute** after reception by MOC + TM available at ICC@ICC **20 minutes** after reception by MOC	See next slide	

TM distribution to ICCs in NRT (commissioning + emergencies) (0)

- The problem:
  - ICC@ICC have a requirement to get instrument TM within 20' after TM reception by MOC during commissioning and emergencies
  - 20' cannot be met for live TM with current concept (FSC delivers consolidated TM to ICC@ICC) as MOC consolidation process requires prior consolidation of the dump TM from the previous OD
  - during commissioning and emergencies, TM is mostly live.

- Potential Solutions: 7 Options (see next slides 1/2/3).
- Are there more options?

TM distribution to ICCs in NRT (commissioning + emergencies) (1)

Implementation options	Advantages	Disadvantages/question marks
1: Move most of ICC @ MOC during commissioning and emergencies	- 20 minutes requirements to deliver TM to ICC@ICC is made irrelevant	- MOC infrastructure has to allow for it - GS would need to be reconfigured afetr commissioning - ICC relocation cost
2: Commissioning is only live (no dump TM to be consolidated prior to live TM).	- 20 minutes requirements to deliver TM to ICC@ICC is met (TBC)	- is solution applicable to emergencies?
3: FSC delivers ONLY non consolidated TM during commissioning or in emergencies	- 20 minutes requirements to deliver TM to ICC@ICC met - FSC and ICC routine operation concept remains in commissioning - no additional comms requirements	- FSC needs to be manned around the clock for this period - Additional FSC effort/cost - Consolidated TM for this phase to be ingested at the end of the phase or after emergencies
4: MOC change consolidation process to allow for live TM consolidation in isolation	- 20 minutes requirements to deliver TM to ICC@ICC met - no additional comms requirements	- Does it make sense to MOC? Is that feasible? Impact on MOC – Ground station protocol?

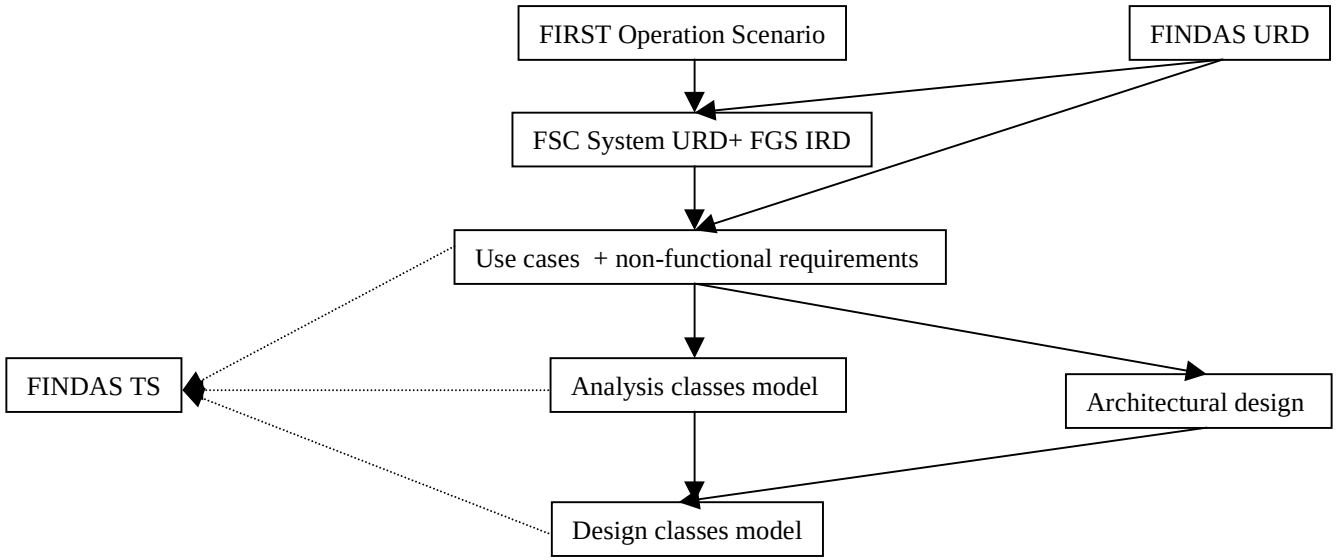
TM distribution to ICCs in NRT (commissioning + emergencies) (2)

Implementation options	Advantages	Disadvantages/question marks
5: MOC delivers TM in NRT in ICC@MOC < 1minute FSC delivers TM in NRT to ICC@ICCs	- 20 minutes requirements to deliver TM to ICC@ICC met	- FSC needs to be manned around the clock for this period - FSC has to import live TM twice, once in NRT , once after consolidation - MOC-FSC private line capacity would need to be doubled (256 -> 512 kbs) + extra HW/SW for routing . - Double performance requirements on FSC System for TM ingestion ⇨ No synergy with planned FSC operation.

TM distribution to ICCs in NRT (commissioning + emergencies) (3)

Implementation options	Advantages	Disadvantages/question marks
6: MOC delivers TM in NRT in ICC@MOC < 1minute MOC delivers TM in NRT (<1 minute) to ICC@ICCs (private lines)	- 20 minutes requirements to deliver TM to ICC@ICC largely met, in fact 1 minute would be met ⇨ move most of ICC@MOC to ICC@ICC, only RTA would be needed at ICC@MOC. ⇨ No need to remote login from ICC@ICC to ICC@MOC. ICC@MOC could be put inside the fire wall	- Need for private (virtual) line between MOC and ICC@ICC - Can private lines be re-activated in case of emergencies? Should public lines be used instead?
7: MOC delivers TM in NRT in ICC@MOC < 1minute ICC@MOC delivers TM in NRT (< 1 minute) to ICC@ICCs Similar technical set-up to option 5 however ICC@MOC-ICC@ICC comms is ICC responsibility	- Same as above	- Same as above - Impact on MOC?

FSC System development stages & FINDAS TS



The FINDAS TS will include the use cases, non functional requirements, analysis and design class models relevant to FINDAS. This will constitute the starting point of the FINDAS development

E W's inputs: (to be attached)

FINDAS URD draft 0.6 was taken as input.

System Requirements
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3.1.1.1 General system requirements

S1 - later
During ILT only a local, single FINDAS node will be needed. But note that the FINDAS servers and FINDAS clients may not be located on the same piece of hardware than the FINDAS node.
We see the meaning of "decentralised operations" in the requirement test as distributed operations.
S2 - ILT
S3 - later
S4 - ILT
S5 - ILT
If only a local, single FINDAS node is available during ILT, then it must be possible to transfer the data collected with the ILT FINDAS system to the next version of FINDAS holding the master FINDAS node at FSC.
S6 - later
S7 - ILT
S8 - ILT
But see also the "sandbox" test environment (requirement S14). It shall be necessary that quick modifications necessary to continue the ILT tests are possible in the instrument specific FINDAS "sandbox" without any interaction with a FINDAS control board.
These modifications during ILT can be merged with the common sandbox later on.
S9 - later
S10 - later
S11 - ILT
S12 - ILT
S13 - ILT
S14 - ILT
S15 - later
S16 - later
S17 - later
S18 - ILT
S19 - ILT
S20 - later
During ILT experts will be available to operate FINDAS. Applications will access FINDAS via FINDAS servers which shall protect the FINDAS

core system.
S21 - later
S22 - ILT
S23 - later

3.1.1.2 FINDAS database component specific requirements

S24 - later
But this is a basic functionality needed later. See also requirement S5.
S25 - ILT
S26 - later
S27 - ILT
S28 - ILT
S29 - ILT
S30 - ILT
S31 - later
S32 - ILT
S33 - ILT
S34 - ILT
S35 - ILT
S36 - ILT
S37 - ILT
S38 - later
We will have the need to update database schema but not during run-time.
S39 - later
S40 - later
S41 - ILT

3.1.2 Functional Requirements
==========
3.1.2.1 General Functional Requirements

F1 - later
F2 - later
F3 - later
F4 - ILT
But the list of language bindings can be limited, e.g. JAVA, C++.
F5 - later
F6 - ILT
F7 - ILT
Not ALL significant data, documentation and software must be stored from ILT on.
F8 - ILT
This will be implemented by the data model.
F9 - ILT
This will be implemented by the data model.

F10 - later
F11 - later
F12 - later
F13 - ILT
F14 - later
F15 - ILT
F16 - ILT
F17 - later
F18 - later
F19 - later
F20 - ILT
F21 - later
F22 - later
F23 - ILT
But very limited session management, no access control and no session logging needed for ILT.
F24 - later
F25 - ILT
F26 - ILT
F27 - ILT
F28 – later
But as already mentioned in the comment for the requirement first ideas may be collected for the corresponding data model.
F29 - later
F30 - later
F31 - later

3.1.2.2 Requirements for configuration management

F32 - later
F33 - ILT
F34 - ILT
F35 - later \
F36 - later \
F37 - later   \ For ILT development the "sandboxes" can be used.
F38 - later   /
F39 - later /
F40 - later /

3.1.3 Operational Requirements
==========
O1 - later
O2 - later
But lower requirements are valid for ILT.
O3 - later
O4 - ILT

But it is not needed in parallel with normal operations.
O5 - later
But rollback functionality can be used for ILT development if the DBMS already provides it.
O6 - ILT
For backup, recovery and rollback.
O7 - later
Can be handled by special FINDAS servers.
O8 - later

3.1.4 Interface Requirements
==========
3.1.4.2 Interface to the Planck DPCs and Planck Requirements

IF1 - ?
IF2 - ?
IF3 - ?
IF4 - ?
IF5 - later
IF6 - later
IF7 - later
IF8 - later
IF9 - later
IF10- later
IF11- later
IF12- later
IF13- later
IF14- later
IF15- later

3.1.4.3 Interface to MOC

IF16- later
See IF21
IF17- later
IF18- later
IF19- later
IF20- ILT
Is used to simulate MOC interface.
IF21- ILT
Is used to simulate MOC interface.

3.1.4.4. Interface to Astronomical Community and end-users

IF22- later
IF23- later

IF24- later
IF25- later
IF26- later
IF27- later
IF28- later
IF29- later
IF30- later
IF31- later
IF32- later
IF33- later
IF34- later
IF35- later

3.2 Constraint Requirements

C1 - ILT
C2 - ILT

3.2.1 Constraint requirements on analysis and design

C3 - ILT
C4 - ILT
C5 - ILT
C6 - ILT
C7 - ILT
C8 - ILT

3.2.2 Constraint Requirements on component development

C9 - ILT
C10 - ILT
C11 - ILT
C12 - ILT
C13 - later
FSC will provide a software tool similar to javadoc for C++ source code files.
C14 - later
C15 - ?????
not applicable, multi-language environment (not only JAVA)
C16 - ILT

3.2.3 Performance constraint requirements

P1 - later
No estimated time has to be send back. But still the response shall be fast.

P2 - later
P3 - later
P4 - ILT
But no distribution between FINDAS node is necessary.
P5 - ILT
TM data shall be available to clients 2 seconds after ingestion.
P6 - ILT
P7 - ILT

Requirements on the FINDAS:

FINDAS shall archive data, software and documents.

FINDAS shall be an object oriented database system (to allow implementation of the common data model).

FINDAS shall allow to distribute data and software modules between the different parties involved with the FIRST mission.

FINDAS shall support the communication (e.g. SPR handling system, mailing lists) between the different parties involved with the FIRST mission.

FINDAS shall be a distributed archive system with the central node located at FSC and satellite nodes located at the ICCs and MOC.

Satellite nodes shall have the same view on the same data as the central node.

Objects ingested at a satellite node shall be automatically forwarded to the central node.

It shall be possible to load objects ingested by a satellite node during off-line mode to the central node.

FINDAS shall support distributed development.

FINDAS shall supply multiple "sand-boxes" for different users or user groups to develop and test new modules or to maintain and test existing modules without to influence the main FINDAS system.

FINDAS shall specify a "unified" development and test environment for FINDAS developers. This include the specification of hardware, operating system and software tools.

FINDAS shall be available continuously around the clock, 7 days on 7, with only minor interruptions for maintenance. FINDAS shall be unavailable for no more the 3 hours on average in any period of 7 days, and no period of unavailability shall exceed 24 hours.

FINDAS shall be able to store 6 Tbytes of FINDAS data and 6 Tbyte of Planck data.

Access to FINDAS (query, data retrieval, data ingestion) shall be access controlled. Every user shall be at least in one user group. Every user group can implement one or more user roles.

Objects with FINDAS shall be allowed to have different versions. Every version of an object shall accessible.

External data sources shall be visible within FINDAS by using internal classes/objects as interfaces.

FINDAS shall be designed in a way that open standard industry interfaces are available, e.g. ODMG, RMI, CORBA.

FINDAS shall be designed in way that it is easily extendible.

Different versions of FINDAS must be downward compatible.

FINDAS shall support seamless transmission between mission phases.

FINDAS shall support an server/client concept to allow the implementation of simple clients.

FINDAS shall be able to display following document formats: HTML, XML, ASCII, PDF, PS.

FINDAS shall be to ingest and browse the above document formats.

FINDAS shall support bulk data delivery via network and storage media like CD, DVD, DAT.

FINDAS shall provide facilities to ingest and distribute

satellite telemetry in real-time.

FINDAS provide an processing environment to run queries, to run FINDAS servers and other tools like SPG.

FINDAS shall provide load-regulating mechanisms and connection management.

Requirements on the DBMS:

The DBMS shall be object oriented.

The DBMS shall be stable.

The DBMS shall supply administration tools for backup, recovery and rollback.

The DBMS shall support distributed locations of the databases.

The DBMS shall support transaction management.

The DBMS shall supply a notification service on database events, e.g. new data inserted.

The DBMS shall allow a batch mode like (scripts) operation.

The DBMS shall support multiple schemas.

The DBMS shall support multiple databases.

The DBMS shall provide schema/database modeling tools.

The DBMS shall shall provide an object browser. This browser shall display the attributes of the object, shall allow to execute the methods of the objects and shall allow to follow any association (links) of this object.

The DBMS shall provide a standard query language.

The DBMS shall provide performance and tuning tools.

The DBMS shall provide bulk copy import/export tools.

The DBMS shall provide document format conversion.

PR's inputs: (to be attached)

Req		Class		Comment
S	1	B	ILT stub	
S	2	B	ILT stub	
S	3	B	ILT stub	
S	4	E	Basic	
S	5	F	ILT partial	
S	6	E	Basic	
S	7	B	ILT stub	"Conformant platform" may have a more relaxed meaning for ILT
S	8	E	Basic	Most modifications during ILT will affect only one party
S	9	A	Not ILT	
S	10	A	Not ILT	Unless 'data sources outside FINDAS' refers to things like offline calibration databases etc.
S	11	E	Basic	
S	12	E	Basic	
S	13	E	Basic	
S	14	F	ILT partial	FINDAS during ILT is essentialy a number of 'sandboxes'. Integration support is only required in
S	15	A	Not ILT	No multiple nodes and telecomm during ILT
S	16	E	Basic	
S	17	F	ILT partial	Scalability is basic. 6 or 7 Terabytes is not required for ILT.
S	18	E	Basic	
S	19	D	ILT plus	
S	20	D	ILT plus	
S	21	A	Not ILT	
S	22	E	Basic	
S	23	E	Basic	
S	24	A	Not ILT	
S	25	E	Basic	
S	26	A	Not ILT	
S	27	E	Basic	
S	28	E	Basic	
S	29	E	Basic	
S	30	E	Basic	
S	31	A	Not ILT	
S	32	E	Basic	
S	33	E	Basic	
S	34	E	Basic	
S	35	A	Not ILT	Assuming the database is (relatively) very small during ILT, possible separate efficiency and tuni

S	36	E	Basic	
S	37	E	Basic	
S	38	D	ILT plus	Interrupting operations for FINDAS maintenance might be more acceptable during ILT
S	39	A	Not ILT	See S35
S	40	E	Basic	
S	41	E	Basic	
F	1	B	ILT stub	
F	2	A	Not ILT	Assuming FINDAS runs in a isolated environment during ILT
F	3	A	Not ILT	
F	4	E	Basic	
F	5	A	Not ILT	
F	6	E	Basic	
F	7	E	Basic	
F	8	D	ILT plus	The 'linking' mechanism is a basic requirement.
F	9	E	Basic	
F	10	A	Not ILT	
F	11	A	Not ILT	
F	12	D	ILT plus	
F	13	E	Basic	
F	14	A	Not ILT	
F	15	E	Basic	
F	16	D	ILT plus	
F	17	A	Not ILT	
F	18	A	Not ILT	
F	19	A	Not ILT	
F	20	D	ILT plus	
F	21	E	Basic	
F	22	A	Not ILT	
F	23	E	Basic	
F	24	D	ILT plus	
F	25	E	Basic	
F	26	A	Not ILT	Only applies to the 'integrated' FINDAS from IST on
F	27	E	Basic	
F	28	D	ILT plus	
F	29	A	Not ILT	
F	30	D	ILT plus	
F	31	D	ILT plus	

F	32	E	Basic	
F	33	E	Basic	
F	34	E	Basic	
F	35	E	Basic	
F	36	E	Basic	
F	37	E	Basic	
F	38	E	Basic	
F	39	E	Basic	
F	40	D	ILT plus	
O	1	D	ILT plus	
O	2	A	Not ILT	
O	3	A	Not ILT	
O	4	F	ILT partial	"parallel with normal operations" may not be needed during ILT
O	5	E	Basic	
O	6	D	ILT plus	
O	7	D	ILT plus	
O	8	E	Basic	
IF	1	C	ILT only	Instrument-specific checkout equipment is only used during ILT (TBC)
IF	2	C	ILT only	
IF	3	C	ILT only	
IF	4	C	ILT only	
IF	5	A	Not ILT	
IF	6	A	Not ILT	
IF	7	A	Not ILT	
IF	8	A	Not ILT	
IF	9	A	Not ILT	
IF	10	A	Not ILT	
IF	11	A	Not ILT	
IF	12	A	Not ILT	
IF	13	A	Not ILT	
IF	14	A	Not ILT	
IF	15	A	Not ILT	
IF	16	A	Not ILT	
IF	17	A	Not ILT	
IF	18	A	Not ILT	
IF	19	A	Not ILT	
IF	20	D	ILT plus	

IF	21	A	Not ILT	
IF	22	A	Not ILT	
IF	23	A	Not ILT	
IF	24	E	Basic	
IF	25	A	Not ILT	
IF	26	D	ILT plus	Similar interface might be useful to ingest external tables for instrument testing
IF	27	E	Basic	
IF	28	D	ILT plus	
IF	29	A	Not ILT	
IF	30	A	Not ILT	
IF	31	E	Basic	
IF	32	D	ILT plus	
IF	33	D	ILT plus	
IF	34	B	ILT stub	Not required but probably a good solution anyway to use a browser as GUI
IF	35	B	ILT stub	
C	1	E	Basic	
C	2	E	Basic	
C	3	E	Basic	
C	4	E	Basic	
C	5	E	Basic	
C	6	E	Basic	
C	7	B	ILT stub	test equipment interfaces may be platform-specific
C	8	D	ILT plus	
C	9	E	Basic	
C	10	B	ILT stub	See C7
C	11	E	Basic	
C	12	D	ILT plus	Maybe this requirement can be relaxed for test-specific parts, if that is opportune
C	13	E	Basic	
C	14	A	Not ILT	
C	15	E	Basic	
C	16	F	ILT partial	
P	1	D	ILT plus	
P	2	A	Not ILT	
P	3	A	Not ILT	
P	4	A	Not ILT	
P	5	D	ILT plus	
P	6	A	Not ILT	

P	7	C	ILT only	That was the purpose of this exercise