

# Documentation for Forward Upgrade

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## • Outline

- General comments (many talks in this meeting mention documentation)
  - Present situation
  - Recommendations
  - My Plans
  - Conclusion
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- **A related “wish” list heard from students many, many times.**

# Documentation – General comments

- **Observations:**

1. The primary purpose would seem to gather all final documentation on every system.
2. Each fSTAR wiki subsystem already contain many pointers to documents that summarize each system.
3. Once FINAL documents are available, those are the ones that get copied to fSTAR wiki.
4. This means other “working” documents will remain as they are under each system.
5. ***This meeting has contained significant number of new items!***

# Which documents do we want on wiki?

1. What items deserve to be moved to wiki as opposed to remaining linked under fSTAR wiki subsystems?
2. As each system already has documentation present, redundancy should be avoided.
3. Point 2 leads to an issue that would mean not to move copies of these documents yet.
4. Reason is because each group appears to be maintaining needed information and thus have standard places they are keeping these documents up to date. Putting copies on wiki would mean documents would become out of date.

# Documentation – Other comments

(will not repeat these for each system

Silion Tracker – Critical items are already listed under [Silicon Tracker](#) on the fSTAR wiki (some shows up under Electronics). for example, putting the below items in is purely a redundant entry.

1. Detailed mechanical drawings of ST and a longer very detailed pdf file outlining all parts are found on Yiyang's drupal home page.
2. Useful summary document is also already there.

# Documentation – General comments

- **Examples of already linked documents:**
- One of Tonko's FCS pages.  
[DEP crate & interconnect topology, nomenclature, numbering](#)
- FCS Akio's page.  
<https://www.star.bnl.gov/protected/spin/akio/fcs/trigger.html>
- Many things show up under “Electronics,” “Slow Controls,” and such.

# My Plans

*I am not going away as STAR is the main project for me once SpinQuest finishes at Fermilab.*

1. Keep in touch with each group and once a Final document is known, then move a copy to the wiki for preservation.
2. Preference will be to put these under each detector separately as that's where people should be looking for it.
3. Make an entry under fSTAR wiki that contains documentation NOT already under each subsystem.
4. I will do this as I get notified that a document is final.
5. In some cases I may need to pick through which parts to include as some contain information on work done to things that contain material not really needed for posterity sake.

# Conclusion Comments

1. Avoid redundant separate documentation section for items already listed on fSTAR wiki..
2. Moving copies to wiki at this point is a bad idea because many of these are working documents that could be updated or become obsolete.
3. Groups should not be expected to change from existing procedures on where things go at this point.
4. Documents that are indeed “Final” then put copies on wiki and change link on wiki page to point to these. Mark them as “Final.”
5. Critical to be certain when this point is reached because wrong copies should not be there!

# Just some additional on a related topic

## Wish item that I often hear from students

**"You should write a book about all of these things."**

- It is common for students to wish that they had some place to learn about the details known to experts on how to do things properly and common mistakes that are easy to make due to inexperience.
- Most often heard when explaining things to students.
- And yes I know this is difficult to impossible.



# Possible Items

1. Oleg's knowledge of correct methods of gluing SiPMs and mistakes he had to fix.
2. Akio's knowledge of correct/incorrect testing methods he has been doing of the FCS (he is not the only one this applies to).
3. Experts who have been involve in running signal and power cables to the detectors. There are a number of issues such as cables that should not be in near proximity, length limitations, proper grounding of both power and signals going to the FEEs. Those items can be very subtle.
4. How detector support/alignment/cooling/gas/etc systems must be done if problems are not to happen. The FST is one of the best examples. The final designs are there, but a new researcher would take a long time to learn them and it would be an advantage to know why things are built the way they are and common mistakes. Some of which were found during detector development.

# Additional examples

1. STGC chambers are complicated and have many subtle issues that have been solved.
2. Experts who have been involved in running signal and power cables to the detectors. Subtle issues such as cables that should not be in near proximity, length limitations, proper grounding of both power and signals going to the FEEs.
3. How detector support/alignment/cooling/gas/etc systems must be done if problems are not to happen. The FST is one of the best examples. The final designs are there, but a new researcher would take a long time to learn them and it would be an advantage to know why things are built the way they are and common mistakes. Some of which were found during detector development.

# Simulation Mistakes

1. List examples of where GEANT or other common simulation programs can yield completely wrong results.
2. Simulation is also something where common mistakes are made.
3. List of simulation mistakes and explanations of how to do them as correctly as presently possible, plus areas where one should not trust certain results.

## Other items (could be semi-infinite)

Things that are “obvious” in retrospect.

1. Oleg's discovery of STAR's stray magnetic field keeping cooling fans from operating without modifications of orientation or shielding.
2. Orientation of PMTs in magnetic fields matters.
3. Textbook or professor's often are completely wrong.
4. This *list probably is nearly infinite*. Just would depend on people recording oddball things they see have learned.